POND SITING REPORT

SR 29
From CR 80A (Cowboy Way) to US 27
Financial Project ID: 417878-1-22-01
Hendry and Glades County

Prepared For:
FLORIDA DEPARTMENT OF TRANSPORTATION
District One

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EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT), District One, is conducting a Project Development and Environment (PD&E) Study on State Road (SR) 29 in Hendry and Glades counties, Florida. The study limits extend from CR 80A (Cowboy Way) north to US 27, a distance of approximately 15 miles.

The purpose of the project is to provide capacity and operational improvements to the existing 2-lane facility by upgrading to a 4-lane facility, including the addition of a new bridge over the Caloosahatchee River. This study meets all requirements of the Federal Highway Administration (FHWA) National Environmental Policy Act (NEPA) regulations.

The purpose of the Pond Siting Report is to document the pond site alternatives assessed along the study corridor. For the pond siting assessment, the corridor was subdivided into two, with the portion of the corridor south of the Caloosahatchee River further divided into basins identified with alphabetic characters, and the portion north of the Caloosahatchee River further divided into basins identified with numeric characters. South of the river, milling and resurfacing is proposed, with added impervious areas limited to turn lanes and sidewalk. North of the river, reconstruction is proposed thereby necessitating the need for stormwater treatment and attenuation. This report identifies one potential pond site alternative per basin for further consideration during the roadway design phase. For each site under consideration, the report will address the soils and groundwater characteristics, hydraulic feasibility, the presence of hazardous material contamination, threatened or endangered species, cultural resources, and wetland indicators. The ponds were sized based on limited information, without the benefit of geotechnical information and survey therefore, the pond sizes presented within this report are approximate and will require further refinement during the design phase.

At the time of this study, it is uncertain if and when the anticipated Statewide Stormwater Rule is to go into effect. The design criteria and details for the new stormwater rule currently have not been finalized. The offsite ponds ***have not been*** sized to meet the new stormwater rule per SFWMD directive.

Note that all elevations sited in this report are $NGVD_{29}$. **Table E.1** on the following pages summarizes the offsite ponds assessed for each basin. Pink highlighted items require further assessment.

Table E.1 Summary of Pond Alternatives Assessed

SEGMENT ONE ALTERNATIVES	POND A	POND 0	POND 1	POND 2	POND 3	POND 4	POND 5	POND 6-1	POND 6-2	POND 7
INFLOW LOCATION (Station)	192+50	283+50	298+30	314+50	348+50	384+00	428+50	477+30	475+00	491+00
INFLOW LENGTH (ft) AND SIDE (LT or RT)	50 LT	50 LT	50 RT	50 RT	50 RT	50 RT	50 RT	50 RT	300 RT	50 RT
SMF SITE AREA (ac)	1.6	1.0	1.6	1.9	3.8	3.3	3.8	3.2	3.7	5.4
EASEMENT AREA (ac)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.20	N/A
EST. GROUND ELEVATION (ft) @THE SMF SITE (Avg.)	18.0	13.0	12.0	15.0	21.0	29.8	33.6	35.8	Unknown	<35.2
EST. DEPTH TO ROCK OR RESTRICTIVE LAYER (in)	24-40	>80	>80	>80	>80	>80	>80	>80	>80	>80
LOW EDGE OF PAVEMENT ELEVATION WITHIN BASIN	19.0	15.4	15.4	18.2	23.0	31.6	36.0	36.1	36.1	36.4
ESTIMATED SHGWT @ SITE	16.8 - 17.5	<6.3	10.5 - 11.5	14.5 - 15.0	19.5 - 20.5	28.3 - 29.3	32.6 - 33.6	34.3 - 35.3	Unknown	33.7 - 34.7
ESTIMATED CONTROL ELEVATION	16.8	9.0	11.3	14.5	19.5	28.3	32.6	33.4	33.4	33.9
HYDRAULIC FEASIBILITY	Fair	Good	Good	Good	Good	Good	Good	Good	Good	Good
TREATMENT SYSTEM	Wet	Dry	Wetland	Wet	Wet	Wet	Wet	Wet	Wetland	Wet
SOILS NAME	Boca	Udifluvents	Wabasso	Riviera	Oldsmar/ Floridana	Oldsmar	Immokalee/ Malabar	Pople/ Gator Muck	Malabar/ Water	Immokalee
HYDROLOGIC SOIL GROUP	A/D	A	C/D	C/D	C/D	C/D	B/D & A/D	B/D & C/D	A/D	B/D
LAND USE	Residential	Open Land	Mixed Wetland Hardwoods	Unimproved Pasture	Improved Pasture	Improved Pasture	Improved Pasture	Mixed Hardwoods/ Wetland Scrub	Mixed Hardwoods/ Freshwater Marsh	Improved Pasture/ Sod Farm/ Ditch
RECORDED ARCHAEOLOGICAL SITES	No	No	No	No	No	No	No	No	No	No
ARCHAEOLOGICAL POTENTIAL	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
RECORDED HISTORICAL STRUCTURES/RESOURCES	No	No	No	No	No	No	No	No	No	No
TENTATIVE CONTAMINATION RANKING	Medium	Medium	Low	No	No	No	No	No	No	No
PROTECTED, THREATENED & ENDANGERED SPECIES	No	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat
WETLAND INVOLVEMENT POTENTIAL	No	No	Significant	No	No	No	No	Medium	High	Low
PROXIMITY TO OUTFALL (ft)	50	50	50	50	280	80	200	50	500	600
NUMBER OF PARCELS	3	2	1	1	1	1	1	1	1	1
PARTIAL (PT) OR WHOLE TAKE (WT)	WT	PT	PT	PT	PT	PT	PT	PT	PT	PT

Requires Additional Investigation

Table E.1 (Continued) Summary of Pond Alternatives Assessed

SEGMENT TWO ALTERNATIVES	POND 8A	POND 8B	POND 9	POND 10	POND 11A	POND 11B	POND 12-13A	POND 13B	POND 14A	POND 14B-15-1	POND 14b-15-2
INFLOW LOCATION (Station)	576+00	587+50	628+50	668+50	690+00	702+50	795+50	835+50	905+00	919+00	919+00
INFLOW LENGTH (ft) AND SIDE (LT or RT)	50 LT	50 RT	50 RT	50 RT	50 RT	50 RT	50 RT	50 RT	50 RT	50 LT	50 LT
SMF SITE AREA (ac)	4.1	2.5	3.5	3.2	2.6	4.7	4.2	3.5	3.8	6.2	6.2
EASEMENT AREA (ac)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
EST. GROUND ELEVATION (ft) @THE SMF SITE (Avg.)	31.8	31.8	32.2	33.2	<33	<33	35.2	<35.8	38.8	38.8	38.8
EST. DEPTH TO ROCK OR RESTRICTIVE LAYER (in)	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
LOW EDGE OF PAVEMENT ELEVATION WITHIN BASIN	35.0	35.0	34.8	35.7	37.0 (Raised One Foot)	37.4 (Raised One Foot)	40.1	40.7	41.3	41.25	41.25
ESTIMATED SHGWT @ SITE	31.9	31.9	30.8	33.2	34.0	34.0	35.2	37.5	37.9	37.9	37.9
ESTIMATED CONTROL ELEVATION	31.9	31.9	30.8	33.2	34.0	34.0	35.2	37.5	37.9	37.9	37.9
HYDRAULIC FEASIBILITY	Good	Good	Good	Good	Good/ Raise Road	Good/ Raise Road	Good	Good	Good	Good	Good
TREATMENT SYSTEM	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet	Wet
SOILS NAME	Oldsmar	Oldsmar	Malabar	Malabar	Pineda	Malabar	Myakka	Malabar/ Basinger	Myakka	Basinger	Basinger/ Water
HYDROLOGIC SOIL GROUP	C/D	C/D	A/D	A/D	C/D	A/D	B/D	A/D	B/D	A/D	A/D
LAND USE	Improved Pasture/ Freashwater Marsh	Improved Pasture	Improved Pasture/ Freshwater Marsh/ Wet Prairie	Wet Prarie	Mixed Wetland Hardwoods	Mixed Wetland Hardwoods/ Freshwater Marsh	Shrub and Brushland	Wet Prairie	Drainage Ditch/ Wet Prairie	Drainage Ditch/ Wet Prairie	Reservoir / Wet Prairie
RECORDED ARCHAEOLOGICAL SITES	No	No	No	No	No	No	No	No	No	No	No
ARCHAEOLOGICAL POTENTIAL	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
RECORDED HISTORICAL STRUCTURES/RESOURCES	No	No	No	No	No	No	No	No	No	No	No
TENTATIVE CONTAMINATION RANKING	No	No	No	No	No	No	No	No	No	No	No
PROTECTED, THREATENED & ENDANGERED SPECIES	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat	Habitat
WETLAND INVOLVEMENT POTENTIAL	Low	No	High	Significant	Significant	Significant	No	Significant	Significant	Significant	Significant
PROXIMITY TO OUTFALL (ft)	250	120	50	50	200	200	400	470	350	150	300
NUMBER OF PARCELS	1	1	1	1	1	1	1	1	1	1	1
PARTIAL (PT) OR WHOLE TAKE (WT)	PT	PT	PT	PT	PT	PT	PT	PT	PT	PT	PT

Requires Additional Investigation

Table E.1 (Continued) Summary of Pond Alternatives Assessed

SEGMENT THREE ALTERNATIVES	POND 16A	POND 16-17
INFLOW LOCATION (Station)	No Stationing	978+00
INFLOW LENGTH (ft) AND SIDE (LT or RT)	50 LT	50 RT
SMF SITE AREA (ac)	3.8	68.8
EASEMENT AREA (ac)	N/A	N/A
EST. GROUND ELEVATION (ft) @THE SMF SITE (Avg.)	<40.0	>40.0
EST. DEPTH TO ROCK OR RESTRICTIVE LAYER (in)	>80	>80
LOW EDGE OF PAVEMENT ELEVATION WITHIN BASIN	41.4	42 +/-
EST. SHGWT @ SITE	39.0	40.0
EST. SHW OF OUTFALL	Unknown	Unknown
HYDRAULIC FEASIBILITY	Good	Good
TREATMENT SYSTEM	Wet	Wetland
SOILS NAME	Immokalee/ Basinger	Water
HYDROLOGIC SOIL GROUP	B/D	N/A
LAND USE	Wet Prairie	Freshwater Marsh (Borrow Pit)
RECORDED ARCHAEOLOGICAL SITES	No	No
ARCHAEOLOGICAL POTENTIAL	Low	Low
RECORDED HISTORICAL STRUCTURES/RESOURCES	No	8GL456
TENTATIVE CONTAMINATION RANKING	No	Low
PROTECTED, THREATENED & ENDANGERED SPECIES	Habitat	Habitat
WETLAND INVOLVEMENT POTENTIAL	Significant	Significant
PROXIMITY TO OUTFALL (ft)	50	50
NUMBER OF PARCELS	1	1
PARTIAL (PT) OR WHOLE TAKE (WT)	PT	PT

Requires Additional Investigation

SECTION 1

1.0 GENERAL PROJECT INFORMATION

1.1 INTRODUCTION

The Florida Department of Transportation (FDOT), District One, is conducting a Project Development and Environment (PD&E) Study on State Road (SR) 29 in Hendry and Glades counties, Florida. The study limits extend from CR 80A (Cowboy Way) north to US 27, a distance of approximately 15 miles. Refer to **Figure 1.1.1** on the following page for the **Project Location Map**. The purpose of the project is to provide capacity and operational improvements to the existing 2-lane facility by upgrading to a 4-lane facility, including the addition of a new bridge over the Caloosahatchee River. This study meets all requirements of the Federal Highway Administration (FHWA) National Environmental Policy Act (NEPA) regulations.

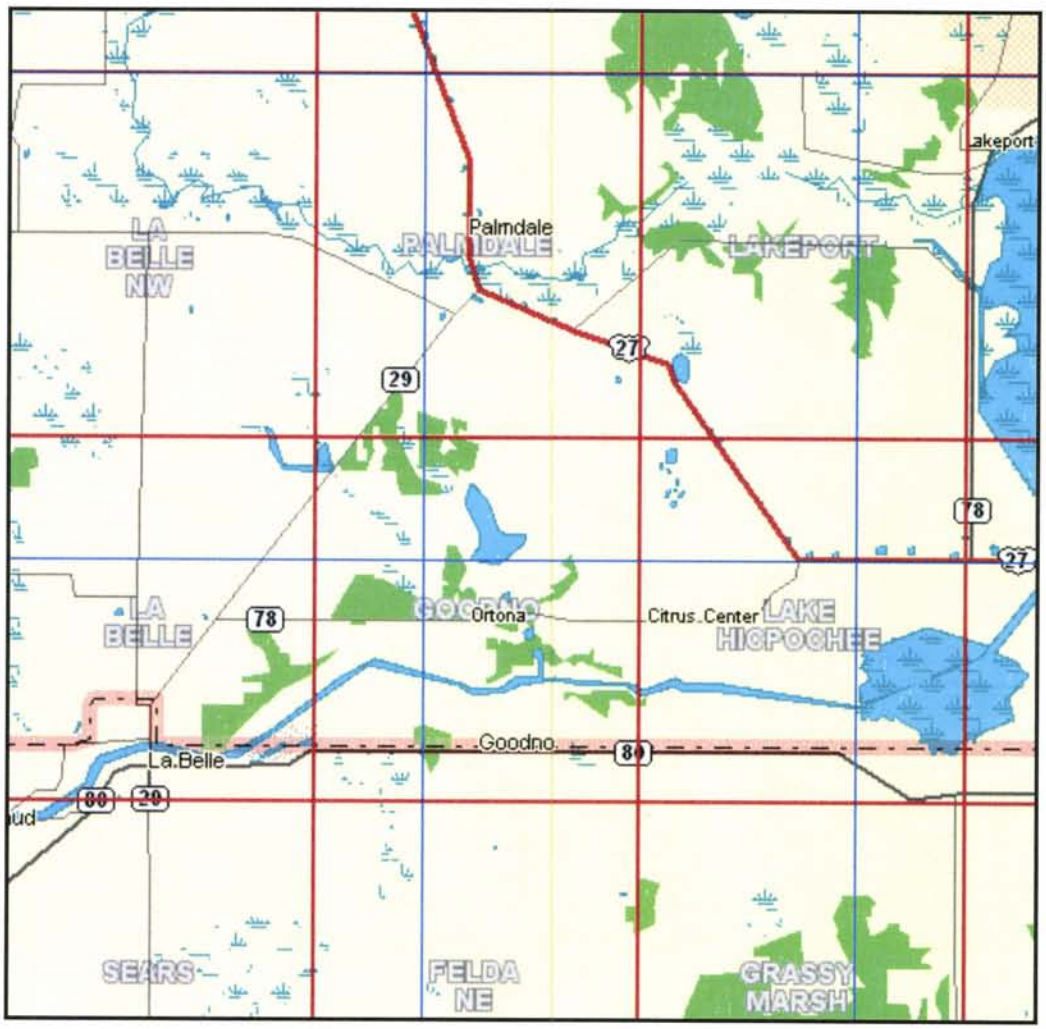
The purpose of the Pond Siting Report is to document the pond site alternatives assessed along the study corridor. For the pond siting assessment, the corridor was subdivided into two, with the portion of the corridor south of the Caloosahatchee River further divided into basins identified with alphabetic characters, and the portion north of the Caloosahatchee River further divided into basins identified with numeric characters. South of the river, milling and resurfacing is proposed, with added impervious areas limited to turn lanes and sidewalk. North of the river, reconstruction is proposed thereby necessitating the need for stormwater treatment and attenuation. This report identifies one potential pond site alternative per basin for further consideration during the roadway design phase. For each site under consideration, the report will address the soils and groundwater characteristics, hydraulic feasibility, the presence of hazardous material contamination, threatened or endangered species, cultural resources, and wetland indicators. The ponds were sized based on limited information, without the benefit of geotechnical information and survey therefore, the pond sizes presented within this report are approximate and will require further refinement during the design phase.

The locations of the pond site alternatives assessed are shown on the Pond Site Alternatives Maps located in **Appendix 2.2.**

Figure 1.1.1 Project Location Map

The SR 29 corridor within the study limits is located on the Sears, LaBelle, Goodno, and Palmdale USGS Quadrangle Maps. Refer to **Figure 1.1.2** on the following page for the location of the **USGS Quadrangle Maps.** Copies of the USGS Quadrangle Maps with the cross drain and bridge basins delineated are also located in **Appendix 2.3.**

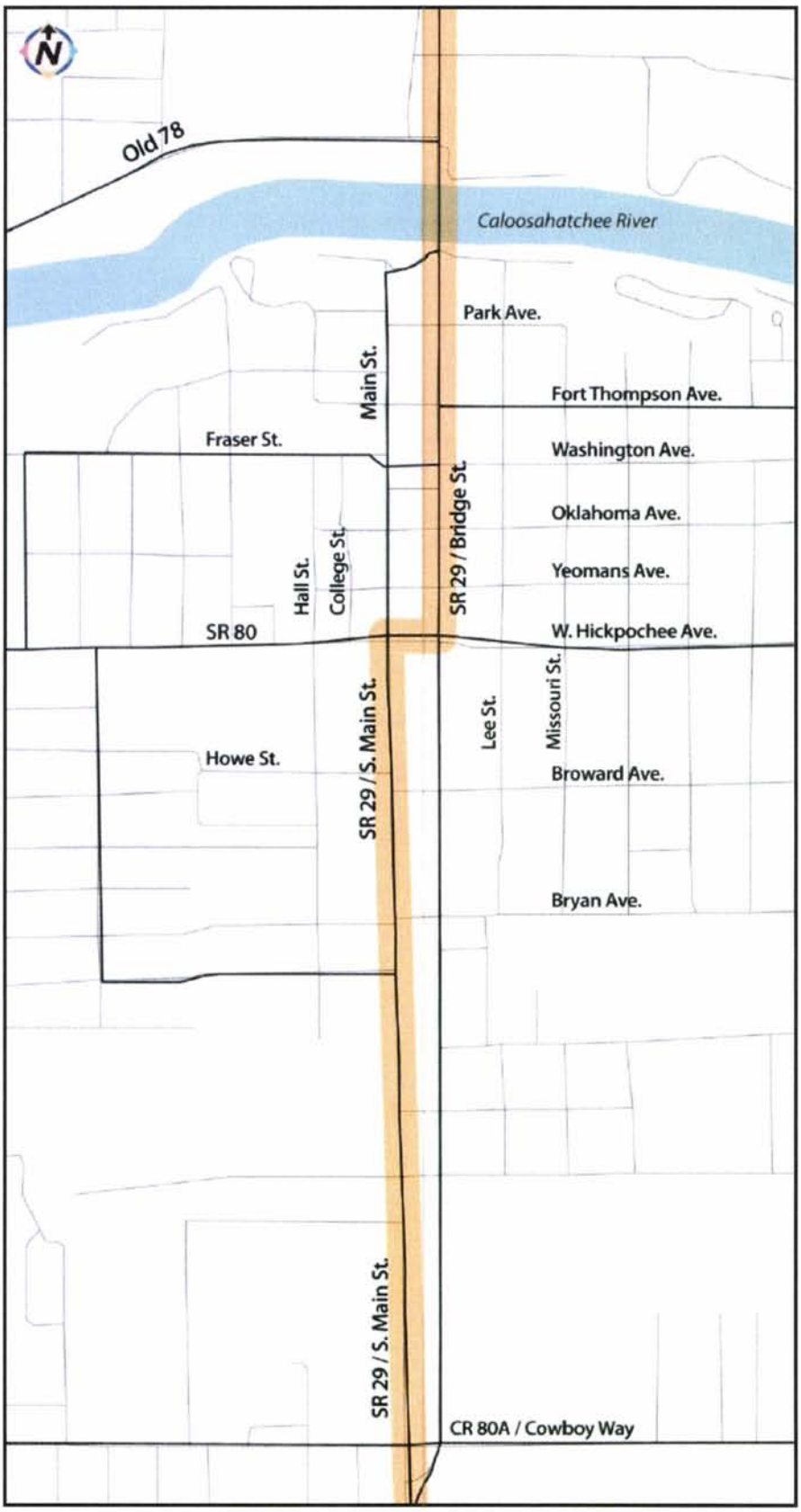
Figure 1.1.2 USGS Quadrangle Maps



1.2 SITE LOCATION AND DESCRIPTION

SR 29 is an SIS facility from SR 82 in Collier County (south of this project's study limits) to US 27 in Glades County. Within the study limits, from CR 80A (Cowboy Way) to US 27, SR 29 currently consists of two- and three-lane urban and rural facilities. SR 29 (Main Street) from CR 80A to SR 80 is a three-lane urban facility with one travel lane in each direction and a two-way center left-turn lane. Within the same area, SR 29A (Bridge Street) is also a three-lane urban facility. At SR 80, the designation of SR 29 shifts from Main Street to Bridge Street. Refer to **Figure 1.2.1** on theCR following page for the **Existing SR 29 Designation Map**.

Figure 1.2.1 Existing SR 29 Designation Map



From SR 80 to the Caloosahatchee River Bridge, SR 29 (Bridge Street) continues as a three-lane urban facility and is within the Downtown LaBelle Historic District. Main Street in this area is a two-lane urban roadway.

The Caloosahatchee River Bridge crossing is a two-lane urban roadway. From north of the bridge to US 27, SR 29 is a two-lane undivided rural facility. Additionally, there is an existing CSX railroad crossing approximately 140 feet south of the intersection of SR 29 and US 27. There are also six (6) additional bridge structures within this segment.

For the purpose of developing and evaluating project alternatives, the SR 29 study area was divided into three corridors as follows:

West Corridor

Central Corridor

East Corridor

As a result of the corridor evaluation, the West Corridor was eliminated from further consideration due to lack of public and government support, direct impacts to the predominately commercial area of LaBelle, and several major environmental justice related issues. The Central Corridor and the East Corridor were carried forward for further study. The detailed analyses of the corridors is documented in the FHWA-approved November 2008 Corridor Evaluation Technical Memorandum.

Along the Central and East Corridors, the project was divided into three segments as follows:

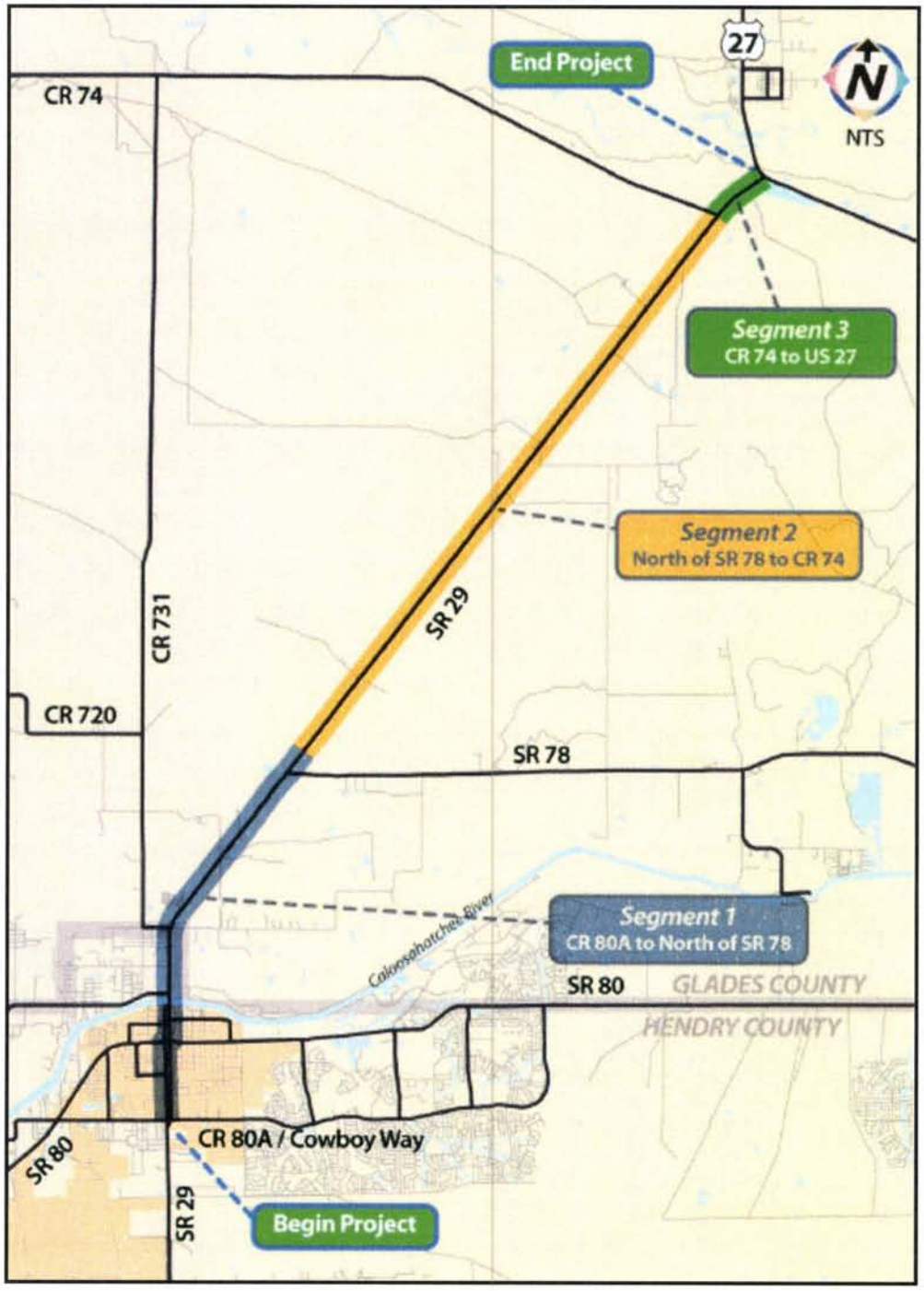
Segment 1 – From CR 80A (Cowboy Way) to north of SR 78

Segment 2 – From north of SR 78 to CR 74

Segment 3 – From CR 74 to US 27

Refer to **Figure 1.2.2** on the following page for the **Project Segments Map.**

Figure 1.2.2 Project Segments Map



As a result of the Alternatives Public Workshop and based on public and local government comment, as well as engineering and environmental evaluation, preferred alternatives have been selected in each segment to be carried forward for detailed analyses. The alternatives selection process is described in

detail in the Alternatives Analysis Memorandum, approved by FHWA on October 11, 2010. The following are brief descriptions of the preferred build alternatives by project segment.

Segment 1 (CR 80A to North of SR 78)

The preferred alternative in Segment 1 **(Option 2)** is a one-way pair alternative that would utilize Bridge Street for two northbound lanes and Main Street for two southbound lanes from C.R. 80A to north of the Caloosahatchee River. With this alternative, the existing two-lane bascule bridge would be replaced and a second two-lane bascule bridge would be constructed at Main Street. Two intersections are being considered at CR 80A for Option 2. The first intersection, **Option 2A**, is a signalized intersection with Main Street and Bridge Street similar to the existing condition. The second intersection configuration, **Option 2B**, being considered is a roundabout. Both intersection options will be considered.

Segment 2 (North of SR 78 to CR 74)

In Segment 2, the **East Option** was selected for further study. The East Option would be a four-lane divided rural facility with a multi-use pathway on the west side of the roadway. Right-of-way would be required on the east side of existing SR 29 for this option.

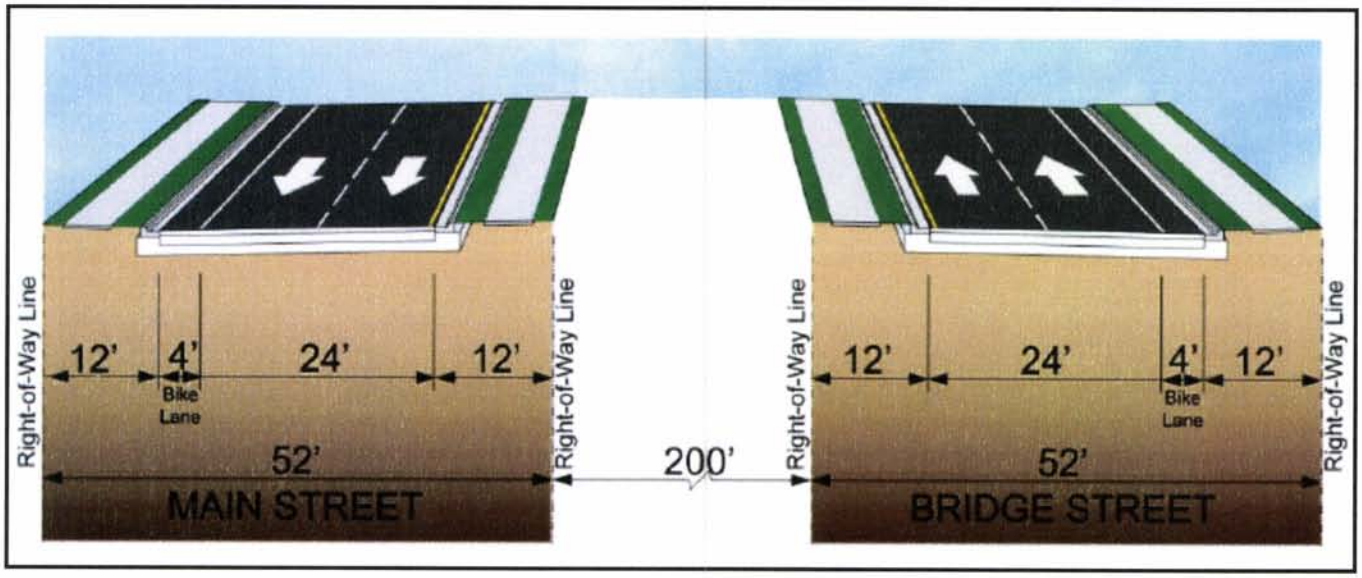
Segment 3 (CR 74 to US 27)

The preferred alternative selected in Segment 3 was **Option 5**, which is a four-lane divided rural facility with a multi-use pathway on the west side of the roadway. This option would provide an interchange at CR 74 and would relocate the SR 29/U.S. 27 intersection to the east of its current location. For this alternative, the existing SR 29 railroad crossing and intersection with US 27 would be eliminated.

1.3 TYPICAL SECTIONS

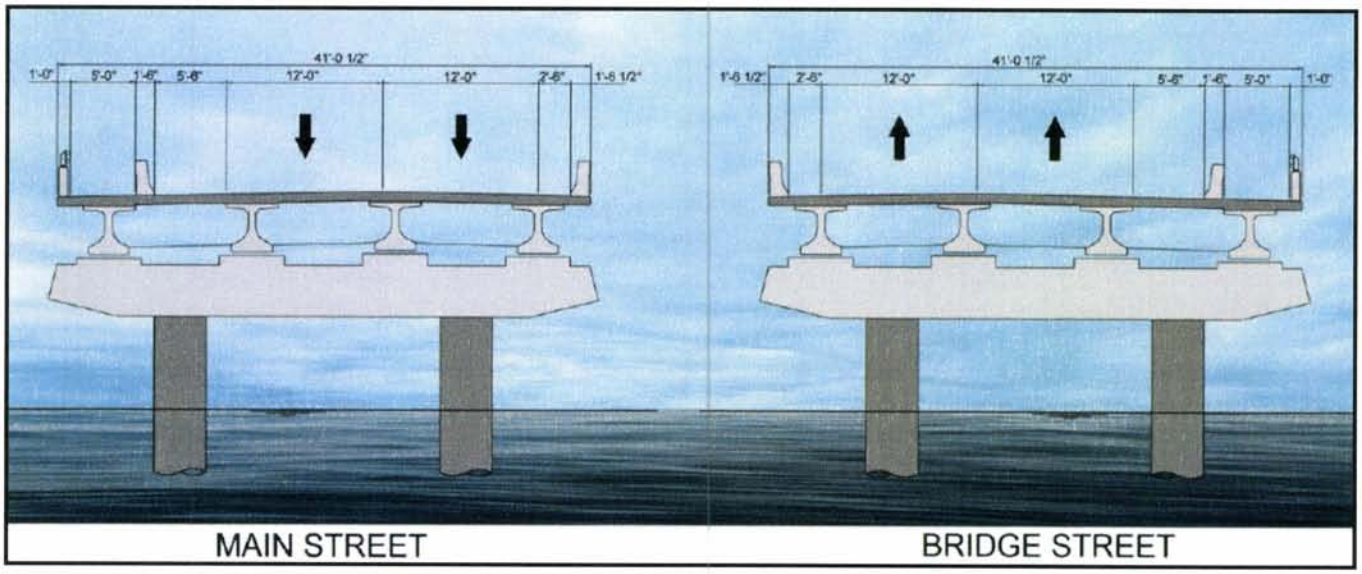
To reduce the impacts to the downtown LaBelle Historic District, the existing two-way facilities on Bridge Street and Main Street are proposed to be converted to one-way facilities. The typical section consists of constructing a one-way pair facility with two lanes, a bike lane, and sidewalks. Curb and gutter is proposed, and conveyance of roadway runoff will be via a storm sewer system of inlets and pipes. Refer to **Figure 1.3.1** on the following page for the **Two-Lane One-Way Pair Urban Typical Section** for SR 29 from CR 80A to Nobles Road.

Figure 1.3.1 Two-Lane One-Way Pair Urban Typical Section



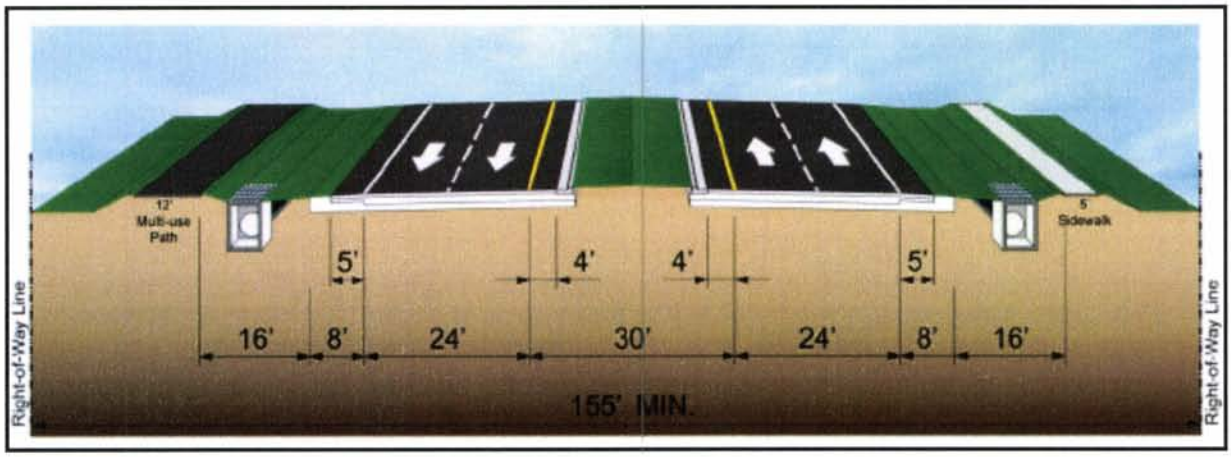
The existing bridge over the Caloosahatchee River is proposed to be replaced, and a new parallel bridge constructed to the west of the existing bridge to accommodate the one-way pair operations. The bridges will accommodate two lanes, inside and outside shoulders, and a sidewalk. Refer to **Figure 1.3.2** below for the **One-Way Pair Bridge Typical Section** for the bridges over the Caloosahatchee River.

Figure 1.3.2 One-Way Pair Bridge Typical Section



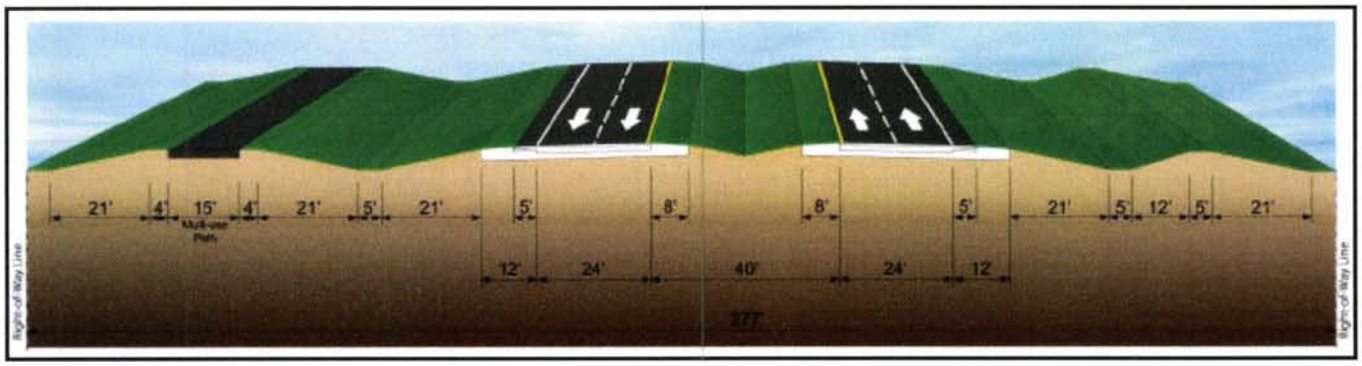
SR 29 from downtown LaBelle to CR 731 transitions from an urban environment to a rural environment entering Glades County. The typical section from Nobles Road to SR 78 is proposed as a four-lane divided suburban typical section. The typical section includes two lanes and inside and outside shoulders in each direction, separated by a raised median. A sidewalk on the east side and a multi-use path on the west side separated from the roadway by drainage swales are proposed. Refer to **Figure 1.3.3** below for the **Suburban Typical Section** from Nobles Road to SR 78.

Figure 1.3.3 Suburban Typical Section



SR 29 in Glades County is a rural environment with one primary land owner. The typical section proposed from SR 78 to US 27 consists of a four-lane divided roadway with two lanes and inside and outside shoulders in each direction separated by a depressed median. A multi-use path is proposed on the west side, separated from the roadway by a drainage swale. The multi-use path and a berm on the east side will prevent offsite runoff from co-mingling with onsite runoff. Refer to **Figure 1.3.4** below for the **Rural Typical Section** from SR 78 to US 27.

Figure 1.3.4 Rural Typical Section



1.4 SOIL CHARACTERISTICS

SR 29 within the project limits is located within Hendry and Glades County. The Natural Resources Conservation Service (NRCS) mapping for Hendry and Glades County identify several soil units within the project area. Refer to **Appendix 3.0** for the NRCS information.

South of the Caloosahatchee River, the soils within the SR 29 right of way are mainly mapped as Boca (1), Pompano (18), Wabasso (6) and Chobee (57) sands. These soils are assigned to hydrologic group A/D and C/D, with A or C being the typical hydrologic group in this area of the project as the area is developed and appears to be well drained. Hydrologic group D soils are likely to be present at the cross drain location just north of Favor Street.

North of the Caloosahatchee River up to the county line, there are Udifluvents (39) along the river, and Wabasso (6), Chobee (57), Riviera (9) and Oldsmar (4) sands. These soils are assigned to hydrologic group A/D and C/D. The area appears to be well drained however hydrologic group D soils are likely to be present within the wetland area near Nobles Road on the east side of SR 29.

For the rural portion of the project in Glades County from the county line to US 27, the soils within the SR 29 right of way are mainly mapped as Oldsmar (23), Immokalee (26), and Myakka (29) which are hydrologic group C/D and B/D soils. There are EauGallie (20), Floridana depressional (16), Malabar (6), Pople (7), Bassinger (14), and Pineda (15) sands and Okeelanta muck (17) mapped in narrow bands crossing through the SR 29 right of way which are most likely hydrologic group D soils associated with low lying areas and waterways. The majority of the area adjacent to SR 29 where offsite ponds will be sited appears to be low lying, and is most likely to be hydrologic group D soils. The seasonal high ground water table appears to be at or above the existing ground in most locations within the rural Glades County portion of the project. At the terminus of SR 29 with US 27, a small area of Pomello (28) sand is present, which is well drained hydrologic group A soils.

1.5 FLOODPLAIN INFORMATION

According to the Flood Insurance Rate Maps (FIRM) for Hendry County (Community Panel Numbers 120107 0035 B and 120109 0001 C) and Glades County (Community Panel Numbers 120095 0200, 0260, 0270, and 0280 B), SR 29 has encroachments into the 100-year floodplain, mainly associated with waterways crossing the roadway at cross drain and bridge locations. Refer to **Appendix 2.4** for the FEMA FIRMettes of the project area. The limits of the 100-year floodplain per GIS data are also shown as orange hatching on the Pond Site Alternatives maps included in **Appendix 2.2**. **Table 1.5.1** below summarizes the base floodplain encroachments estimated from both the FIRM maps and GIS data.

Table 1.5.1 Base Floodplain Encroachment Locations

From Station	To Station	Flood Zone	Base Flood Elevation (ft-NGVD)	Remarks
188+00	192+00	A	19.0	LaBelle A
215+00	222+00	AH	17.0	Stream D
224+00	233+00	AH	16.0	Stream C
243+00	245+00	AH	16.0	Stream B
253+00	254+00	A	Not determined	Unnamed
258+00	268+00	B	Not determined	Stream E
300+00		Not Mapped	9.0 +	From Caloosahatchee River
378+00	382+00	A	Not determined	Unnamed
428+00	433+00	A	Not determined	North Okaloacoochee
470+00	484+00	A	Not determined	Unnamed
582+00	584+00	A	Not determined	Lone Pine Creek
601+00	610+00	A	Not determined	Unnamed
615+00	623+00	A	Not determined	Unnamed
685+00	687+00	A	Not determined	Cypress Branch, AKA Chapporal Slough
694+00	698+00	A	Not determined	Cypress Branch, AKA Chapporal Slough
722+00	727+00	A	Not determined	Unnamed
821+00	829+00	A	Not determined	York Branch
909+00	938+00	A	Not determined	Turkey Branch
977+00	990+00	A	Not determined	Unnamed (Borrow Pit)
SR 74 Extension	1,050 LF	A	Not determined	Isolated
SR 74 Extension	1,140 LF	A	Not determined	Isolated
SR 74 Extension	540 LF	A	Not determined	Unnamed (Borrow Pit)

Refer to **Section 4.2.7** for a discussion regarding the recommended remediation for the floodplain impacts associated with this project.

SECTION 2

2.0 COORDINATION AND RESOURCE INFORMATION

2.1 INVESTIGATIONS

Initial investigations and data collection were conducted to establish the existing conditions, available information, and historical conditions.

2.1.1 FIELD REVIEWS

Field reviews were conducted during September 2007, February 2009, and June 2010 to identify potential pond site locations, photo document the existing conditions, and measure the stain lines down from the top of the headwalls or bridge decks to estimate seasonal high water levels.

The terrain is flat yet urbanized in the Hendry County portion of the project. Roadway runoff is conveyed either by inlets and storm sewer systems or shallow swales to streams. Water was observed within the streams only, roadside swales where present were observed to be dry.

The terrain in Glades County was noted to be flat pasture and farm lands or undeveloped areas dominated by wetlands. Evidence of high water staining less than two feet below the bottom of all the bridge decks was observed. The concrete headwalls and bridge piles also show signs of a water environment that is highly corrosive to concrete, as the concrete is pitted and the aggregate is exposed below the high water stain lines for most of the older existing structures in Glades County.

Field review notes and photos are included in **Appendix 1.3**.

2.1.2 FDOT COORDINATION

On August 25, 2008 the FDOT Maintenance Office in LaBelle was contacted regarding reports of roadway overtopping as a result of tropical storm Fay. It was confirmed that SR 29 was closed on August 20, 2008 and reopened the next day. The limits of closure were from just north of the bridge at Cypress Branch from approximately mile post 6.877 to mile post 9.361. Water was sheeting over the roadway within the closed section, and water was also staging onto the travel lanes in numerous locations. Flooding problems were attributed to the lack of ditches to convey the water. Refer to **Appendix 1.1** for FDOT Correspondence.

The historic drainage maps were obtained from the FDOT District One office, and are included in **Appendix 2.1**.

2.1.3 SFWMD COORDINATION

On September 22, 2010 a pre-application meeting was held at the Fort Myers Service Office. The project area studied for the PD&E will most likely result in more than one design and construction project with the county line as a division therefore, it was established that the project(s) in Hendry County will be permitted through the Fort Myers Service Office, and that the project(s) in Glades County will be permitted through the Okeechobee Service Office. Since there is an existing permit already associated with SR 29, they requested that the project be permitted as a permit modification.

For the portion of the project located south of the Caloosahatchee River, an exemption could be acceptable for the addition of turn lanes if they meet all of the criteria. For the portion of the project that involves widening, stormwater ponds for treatment and attenuation will be required. A 50% increase in treatment volume is required because the Caloosahatchee River is an impaired water body. Portions of the project within the existing right of way can meet the SFWMD 72-hour 25-year post peak discharge less than the pre peak discharge attenuation requirement. However, portions of the project requiring new right of way, including offsite pond sites, will need to meet the CSM discharge criteria established for the Caloosahatchee River Basin. We were advised to coordinate further with the Okeechobee Service Office in this regard.

The downtown LaBelle area of the project and the bridge over the Caloosahatchee River were also discussed. Since the downtown area will only involve milling and resurfacing with the addition of turn lanes less than one quarter mile in length, the project activity in this area of the corridor should be exempt. For the south side of the new bridge over the Caloosahatchee River, a structural BMP or "StormCeptor" on the south side is acceptable.

It was also established that the Caloosahatchee River is a manmade canal at the proposed bridge crossing location, and that it was not anticipated to be a sovereign water body. A formal sovereign submerged lands determination will be requested once the bridge plans are finalized.

On October 6, 2010 a pre-application meeting was held at the Okeechobee Service Office. It was advised to design the ponds utilizing the current criteria due to the uncertainty of when the new Statewide Stormwater Rule will go into effect. The project area contributes to the Caloosahatchee River and Fisheating Creek basins, both of which are impaired water bodies. Pollutant loading removal calculations demonstrating no net increase will be required. Further clarification of the CSM discharge criteria for the Caloosahatchee River basin was provided. Any new right of way, including pond sites, will be required to limit the discharge rate to 30.1 CSM (cfs per square mile). A weighted allowable discharge rate will need to be calculated for each outfall location. The northern basin to Fisheating Creek can meet pre vs. post discharge criteria.

It was brought to our attention that the gas station just north of the Caloosahatchee River at North River Road and SR 29, on the west side, is in the process of remediating a contamination issue.

The project corridor within Glades County is within a Wood Stork core foraging area, and Cara Cara are also present. It was expressed that wetland impacts could be reduced with a re-alignment at US 27, and selection of the western alignment alternative.

It was requested that we demonstrate no adverse impacts for floodplains as a result of the proposed project. The bridge hydraulics design will need to demonstrate no adverse impacts,

and no scuppers will be allowed on the proposed bridges. Refer to **Appendix 1.2** for SFWMD Correspondence.

2.2 CURVE NUMBERS

The Curve Number (CN) for all manmade impervious areas (asphalt, concrete, and buildings) is 98 regardless of the soil type. For water, the CN is always 100. For the unpaved areas within the right of way, **Table 2.2.1** below was developed specifically for this project to establish the CN value used for the ground cover and soil types encountered.

Table 2.2.1 CN Values for Each Hydrologic Group Encountered

HYDROLOGIC GROUP	LAND USE				
	OPEN SPACE GOOD COND.	PASTURE GOOD COND.	WOODS GOOD COVER	RESIDENTIAL 1 AC	DIRT
A	39	30	25	51	72
C	74	71	70	79	87

2.3 RAINFALL DATA

Per SFWMD criteria the design storm event is the SFWMD 25-year/3-day storm for the stormwater management design within an open basin. In addition, the FDOT storm events are required to be analyzed to determine the critical duration for each return frequency. The following table summarizes the rainfall amounts for each storm event. The rainfalls noted for the 2-day and 4-day events in Appendix B-Precipitation Data of the Drainage Manual were interpolated to determine the rainfalls for the 3-day event. The IDF curves for Zone 8 also included in Appendix B of the Drainage Manual were utilized to calculate the FDOT rainfalls for the 1-hour through 8-hour duration storm events. Refer to **Table 2.3.1** on the following page for rainfall amounts in inches for each storm event.

Table 2.3.1 Rainfall Amount Summary in Inches

STORM EVENT	RETURN PERIOD					
	2-YEAR	5-YEAR	10-YEAR	25-YEAR	50-YEAR	100-YEAR
SFWMD 3-DAY	4.2	5.8	7.0	8.7	10.0	11.7
FDOT 1-HOUR	2.5	3.0	3.3	3.8	4.3	4.6
FDOT 2-HOUR	2.8	3.5	4.0	4.6	5.2	5.6
FDOT 4-HOUR	3.3	4.0	4.6	5.4	6.1	6.7
FDOT 8-HOUR	3.8	4.9	5.6	6.4	7.4	7.8
FDOT 24-HOUR	4.5	6.0	7.0	8.0	9.0	10.0
FDOT 3-DAY	5.5	7.5	8.5	10.0	11.0	13.0

2.4 RESOURCES FOR ANALYSIS

The most recent applicable publications available were utilized for reference. The following is a list of resources utilized for the pond siting report analysis for this project:

1) Florida Department of Transportation
    a. Staff directives
    b. FDOT Project Development and Environmental Manual
    c. FDOT Drainage Manual
    d. FDOT Drainage Handbook Hydrology
    e. FDOT Design Standards (English Units)
    f. 1947 Construction Plans
    g. Historic Drainage Maps
    h. Straight Line Diagrams
    i. Previous Projects Survey Files
2) Other
    a. FEMA FIRM Maps for Hendry and Glades County
    b. USGS Maps
    c. NRCS Soil Survey
    d. Environmental Assessments by URS

2.5 PERMITS REQUIRED

1) South Florida Water Management District Environmental Resource Permit (SFWMD ERP)
2) US Army Corps of Engineers (USACE)
3) National Pollutant Discharge Elimination System (NPDES)

SECTION 3

3.0 EXISTING DRAINAGE CHARACTERISTICS

3.1 WATERSHED DESCRIPTIONS

The project area from SR 80A to CR 74 just south of US 27 is within the Caloosahatchee River Basin. The Caloosahatchee River drains southwest to the Gulf of Mexico in Lee County.

The project area from CR 74 to US 27 drains to Fisheating Creek, which is located within the Lake Okeechobee Basin. Per coordination with SFWMD, both the Caloosahatchee River and Fisheating Creek are listed as impaired water bodies and no additional loading of pollutants, nitrogen and phosphorous, will be allowed.

3.2 BASIN DESCRIPTIONS

South of the Caloosahatchee River, only the limits of Basin A were determined. The remaining area south of the Caloosahatchee River was not subdivided into basins for analysis as the proposed improvements are limited to milling and resurfacing and the addition of turn lanes. At the time of the study, adequate survey data was not available to determine the basin divide locations within the right of way for each of the lateral crossings. From CR 80A to SR 80, roadside ditches convey runoff to lateral crossings LaBelle A, and Streams B, C, and D. Each of these lateral crossings conveys east to west, and eventually discharge into the Caloosahatchee River. From SR 80 north to the bridge over the Caloosahatchee River, both Main Street and Bridge Street are urban sections with curb inlets and storm sewer. The storm sewer system discharges to Stream E, which conveys east to the Caloosahatchee River.

North of the Caloosahatchee River, the project area was subdivided into 20 basins for further analysis: Basins 0 thru 19. Roadside ditches convey runoff to cross drains or bridges. The ditch high points serve as the basin divisions within the roadway right of way. The ditch high points were determined from available survey. The basin divides beyond the right of way limits were determined from available

survey data, aerial mapping, USGS maps, and historic FDOT Drainage Maps. The basin divides deviate from those shown on the historic drainage maps due to manmade alterations such as roads and ditches observed on the aerial maps. The divides and resulting basin areas were based on an engineering assessment of the best available information at the time of the study, and should be revisited if contour mapping with more frequent intervals than five feet becomes available. **Table 3.2.1** below summarizes the basin data for SR 29 from Favor Street (south of CR 80A) to US 27. The basin limits for each of the cross drains and bridges evaluated are also shown on the USGS maps included in **Appendix 2.3**.

Table 3.2.1 Basin Data Summary

From Station	To Station	Basin ID	Area (Ac.)	Existing Crossing
179+90	200+00	A	122.5	3-29"x45" CD at LaBelle A
Not determined	Not determined	D	Not determined	2-30" CD at Stream D
Not determined	Not determined	C	Not determined	2-30" CD at Stream C
Not determined	Not determined	B	Not determined	4-30" CD at Stream B
Not determined	Not determined	E	Not determined	Storm Sewer to Stream E
284+00	293+30	0	32.2	Direct to Caloosahatchee River
293+30	374+50	1	694.1	8'x7' CBC
311+10	333+20	2	6.5	24" CD to Basin 1
333+20	374+50	3	277.1	3-42" CD to Basin 1
374+50	443+00	4	220.9	2-42" CD
443+00	457+20	5	2,709.0	2-17.5' Span Bridge at North Okaloacoochee
457+20	479+80	6	111.0	30" CD
479+80	527+00	7	1,465.0	14' Span Bridge
527+00	604+60	8	3,144.0	3-15' Span Bridge at Lone Pine Creek
604+60	656+60	9	302.1	3-30" CD
656+60	675+00	10	258.5	3-36" CD
675+00	764+70	11	17,767.0	10-15' Span Bridge at Cypress Branch
764+70	819+00	12	193.7	4-15" CD
819+00	870+70	13	3,364.0	3-20' Span Bridge at York Branch
870+70	915+00	14	1,820.0	2-15' Span Bridge at Turkey Branch
915+00	950+00	15	200.8	36" CD
950+00	965+40	16	Not determined	West side, drains away
965+40	977+10	17	23.4	24" CD
950+00	977+10	18	290.9	East side, drains away
977+10	990+00	19	Not determined	Borrow Pit

3.3 CROSS DRAIN DATA

Table 3.3.1 below summarizes the existing conditions data for the cross drains within the project.

Table 3.3.1 Existing Cross Drain Data

No.	Cross Drain	Location (Constr. CL)	Location (Survey BL)	Length (ft)	U/S FL Elevation	D/S FL Elevation	Flow Direction
1	3-29"x45"	189+60	na	60	15.70	15.60	E-W
2	2-30"	882+00 (M.S.)	na	82	nd	nd	E-W
3	2-30"	892+00 (M.S.)	na	73	nd	nd	E-W
4	4-30"	906+70 (M.S.)	na	68	nd	nd	E-W
5	8'x7'	299+80	30+82	89	7.80	7.69	E-W
6	24"	312+30	42+95	95	17.20	16.51	W-E
7	3-42"	342+60	73+22	99	17.72	17.72	W-E
8	2-42"	380+45	111+41	90	26.75	25.95	W-E
9	30"	473+00	203+96	101	31.79	33.34	W-E
10	3-30"	625+00	356+00	97	29.90	29.50	W-E
11	3-36"	664+00	395+00	93	30.40	29.90	W-E
12	4-24"	801+00	531+94	89	34.20	34.00	W-E
13	36"	941+00	672+00	97	35.45	35.22	W-E
14	24"	974+10	705+00	98	37.85	37.23	E-W

Cross drain locations with the (M.S.) designation indicate that the cross drains are referenced to the Main Street centerline of stationing. The information provided in the above summary table was determined by reviewing the straight line diagrams and the existing survey information. Field measurements were utilized to resolve any discrepancies. Flow line elevations typically were not identified on the available topographic files; therefore they were estimated from the available survey data utilizing CADD tools.

3.4 BRIDGE DATA

Table 3.4.1 on the following page summarizes the existing conditions data for the bridges within the project.

Table 3.4.1 Existing Bridge Data

Bridge No.	Name of Crossing	Begin Mile Post	End Mile Post	SLD Length (ft)	Bridge Type	Number of Spans	Bridge Opening Length** (ft)	Flow Direction
070033	Caloosahatchee River	17.486	17.581	502	Bascule	9	N/A	E-W
050941	North Okaloacoochee River	1.846	1.858	63	Flat Slab	2	35	W-E
N/A*	Unnamed	2.820		N/A	Flat Slab	1	14	W-E
050035	Lone Pine Creek	4.709	4.723	74	Flat Slab	3	45	W-E
050033	Cypress Branch	6.848	6.877	153	Flat Slab	10	151	W-E
050032	York Branch	9.347	9.361	74	Flat Slab	3	60	W-E
050031	Turkey Branch	10.925	10.936	58	Flat Slab	2	30	W-E

*Noted as a 13'x7' CBC on the SLD
**Approximated, measured with MicroStation (aerial files and existing survey files checked)

The bridge over the Caloosahatchee River is located in Hendry County. It has a sufficiency rating of 46, and will be replaced. The remaining six bridges located along SR 29 within the study limits are all located in Glades County. They all have sufficiency ratings above 90, and are not considered structurally deficient. However, they all show evidence of not meeting the FDOT criteria for 2.0 feet of freeboard above the design high water, as all six bridges have dark stain lines less than 2.0 feet below the low members (bottom of slabs) of each bridge. At some locations, the concrete is pitted within 2.0 feet and stain lines within inches of the low member, evidence of long term standing water and high seasonal high water elevations. Most of the existing bridges also have scuppers, and as a result SFWMD has asked that the existing bridges be replaced.

3.5 FLOODING ISSUES

The roadway within the Cypress Branch area, Basin 11, has a documented history of roadway overtopping. SR 29 was closed on August 20, 2008 as a result of rainfall runoff associated with Tropical Storm Fay. The analysis of the existing cross drains and bridges located within the study corridor in Glades County predicts that roadway overtopping will occur along most of the corridor for the greater storm events. Refer to the Location Hydraulics Report for the existing conditions and proposed alternatives analysis for the cross drains and bridges located along the study corridor.

SECTION 4

4.0 PROPOSED DRAINAGE DESIGN

4.1 STORMWATER MANAGEMENT DESIGN APPROACH

The proposed roadway project area is divided into pond basins that may have a different configuration than the existing condition basins to better facilitate the conveyance of roadway runoff for storm water treatment and attenuation to the pond sites. All contributing offsite areas wherever possible will be intercepted and ditched or piped directly to the basin outfalls. The remaining contributing offsite and project runoff will be routed to a pond for treatment and attenuation.

This Pond Siting Report assesses offsite ponds for stormwater treatment and attenuation. Field visits and an evaluation of aerial contour maps and USGS maps were utilized to select pond site alternatives for each basin. Avoidance of wetlands was a consideration for this project but was not always practical as wetlands adjacent to the roadway span most of several basins within Glades County.

South of the Caloosahatchee River, one pond site was assessed south of CR 80A to address the proposed widening for the transition from a single alignment along SR 29 to the south of the project to one way pairs along Bridge Street and Main Street to the north. The proposed turn lanes south of CR 80A impact the roadside ditches which will likely necessitate the need for treatment of the added impervious area. It is anticipated that runoff from an area of roadway equivalent to the added impervious areas will be captured and conveyed via storm sewer inlets and pipes to the pond to provide compensatory treatment and attenuation. The pond will discharge via a storm sewer system to the outfall location.

North of the Caloosahatchee River, 23 pond sites were assessed to accommodate 20 basins. Two alternatives were assessed for three of the basins. For each offsite pond alternative, runoff is proposed to convey in roadside swales to a piped system that conveys to the pond. To provide sufficient pollutant loading removal, a system of shallow roadside swales set approximately 1.5 feet above the seasonal high ground water table with ditch bottom inlets set up to four inches above the bottom to provide some dry retention is recommended to be incorporated into the design wherever practical. The dry retention

swales will help reduce the sizes of the offsite ponds. The swales can be as shallow as one to 1.5 feet deep from the shoulder break point if it can be demonstrated that the drawdown time is of a short duration as not to affect the roadway base. A safety factor of 2 is recommended, with drawdown occurring in less than 24 hours.

The offsite ponds will discharge via a storm sewer system to the outfall location. Ditch bottom inlets are recommended to serve as the outfall control structures, modified to include a "V" notch weir for treatment volume drawdown, and a rectangular weir for attenuation. It is recommended that the control structure grate be set just above the design high water for the critical duration 100-year return frequency storm event to serve as an emergency overflow should the weirs become blocked.

Refer to **Appendix 2.2** for the pond site alternatives maps. Each of the pond alternatives was assessed for site size required, hydraulic feasibility, environmental considerations, contamination issues, and cultural resources. Construction costs and land acquisition costs were not addressed as the PD&E phase can precede the design phase by many years and the unit cost estimates are likely to change. The construction and acquisition costs will be addressed during design.

4.2 DESIGN CRITERIA

The pond and stormsewer design for this project will meet the criteria set forth in the following manuals:

a. FDOT Drainage Manual
b. FDOT Drainage Handbook Hydrology
c. FDOT Stormwater Management Facility Handbook
d. FDOT Storm Drain Handbook
e. SFWMD ERP Information Manual

4.2.1 CONVEYANCE

The proposed roadway will utilize a system of shallow swales, ditch bottom inlets and pipes to convey runoff. Runoff will convey via pipe to the offsite ponds. The design event for the conveyance system of swales, pipes, and inlets is the 10-year frequency storm event per Section 2.2 of the FDOT Drainage Manual.

4.2.2 NORMAL WATER LEVEL (NWL) ESTABLISHMENT

The normal water level is the design starting water elevation used when determining stage/storage design computations in a retention or detention area. The normal water level is typically a function of the seasonal high groundwater table elevation (SHGWT) of the site. Soil investigations by the geotechnical engineer, field observations and water elevation measurements by the drainage engineer, and vegetative indicators as observed by a biologist are typically all considered when establishing the SHGWT of the site. The seasonal high established for the outfall is also considered. The NWL must be at or above the seasonal high of the receiving water body for the pond to function properly.

Geotechnical and survey services were not available for this study. Therefore, the SHGWT was estimated by reviewing the historic drainage maps, previous project's survey data and the USGS maps. Typically, the SHGWT was assumed to be at the surface in the vicinity of the cross drain outfalls and downstream of the bridge crossings. As the SHGWT is a significant factor in sizing pond site alternatives, the pond sizes will require refinement during design when geotechnical and survey services are available.

For wet detention systems it is common practice to set the normal water level or control elevation at the SHGWT of the site. For wet detention, the control elevation can be set lower than the SHGWT if it can be proven that no harmful drawdown affects occur to adjacent wetlands, and that it has been set above the SHW of the receiving water body. Pond liners can be utilized to prevent the infiltration of base flow from the surrounding ground water table and eliminate impacts to adjacent wetlands. Wet detention is proposed for all offsite ponds within the study corridor.

For dry retention systems, the bottom of the pond is required to be one foot above the seasonal high ground water table. It is our recommendation to utilize a minimum of 1.5 feet to ensure adequate infiltration will occur and recovery times will sufficient.

4.2.3 WATER QUALITY (TREATMENT)

The offsite ponds for this project have been sized to treat the proposed four-lane roadway. Chapter 5, Section 5.2.a.1 of the ERP Manual requires treatment of one inch of runoff from the developed project or 2.5 inches times the percentage of imperviousness, whichever is greater. However, SFWMD has agreed to allow treatment based on 2.5 inches times the percentage of imperviousness since the one inch over the developed project resulted in excessively large pond sites. The developed project area calculation includes the pond site, median, and swale areas which are large open spaces that do not contribute added pollutant loading, as the FDOT does not apply fertilizers or pesticides to the grass areas within their right of way.

The project area contributes to the Caloosahatchee River and Fisheating Creek basins, both of which are impaired water bodies. As a result, the required treatment volume as calculated per the 2.5" over the percent imperviousness was increased by an additional 50% to determine the total treatment volume required. Dry ponds are required to provide 75% of the required treatment volume calculated for wet detention ponds.

Drawdown of half of the treatment volume will occur in 24 hours via a "V" notch weir sized per Figure G-2 of the SFWMD ERP Manual.

4.2.4 WATER QUANTITY (ATTENUATION)

The stormwater ponds for this project will discharge to open basins. Typically the criterion is to attenuate the difference in the runoff rate for pre vs. post for the SFWMD 25-year, 72-hour storm. The criterion is per Chapter 6, Section 6.2 and 6.3 of the ERP Manual. However, for the portion of the project within the Caloosahatchee River basin, any proposed right of way area will be required to meet the 30.1 CSM (cfs per square mile) limiting discharge criteria per SFWMD directive. To determine the actual allowable discharge rate for each basin, the allowable discharge per pre vs. post criteria will be calculated for the existing right of way area, and per the CSM discharge criteria for the proposed right of way area (including proposed roadway and

pond site right of way), and summed to determine the total allowable peak discharge rate at each outfall location within the Caloosahatchee River basin.

4.2.5 TAILWATER AND OUTFALL CONDITIONS

The seasonal high water for each outfall was estimated by assessing USGS contour maps, field observations, and water and stain line elevation measurements. Most of the pond alternatives are located adjacent to or in reasonable proximity to the outfall, either a wetland or lateral ditch. Those that are not conveniently located adjacent to a receiving water body will need to be piped to the outfall location. It is recommended that the tailwater elevations be established during design by evaluating the results of the geotechnical and biological assessments.

4.2.6 CRITICAL DURATION

Rule Chapter 14-86 of the Florida Administrative Code requires using a multiple storm approach when assessing the peak discharge rate (pre and post) from a project. Per Chapter 5.1 of the FDOT Stormwater Management Facility Handbook, a storm for storm approach is preferred. This approach necessitates the need to also model the more frequent FDOT design storms (2-year through 50-year) in addition to the 100-year storm event. However, it is also acceptable, upon approval by the District Drainage Engineer, to meet the attenuation requirements for just the critical duration storm events only. A storm for storm approach results in larger pond sizes than a critical duration only approach. For this project, meeting the 30.1 CSM limiting discharge criteria for the portions of the project located within proposed right of way will likely govern the discharge criteria and pond sizes required for attenuation.

4.2.7 FLOODPLAIN ENCROACHMENT VOLUME

The 100-year floodplain encroachment volume is defined as the proposed fill between the estimated seasonal high water elevation (if above ground) or the existing ground, and the proposed 100-year peak stage per Chapter 4, Section 4.4 of the ERP Manual.

As a result of the proposed SR 29 roadway improvements, portions of the existing floodplain will be impacted by the roadway widening and proposed pond sites. The impacts should be mitigated within the proposed ditches and ponds where possible. However, due to the extensive wetland impacts anticipated for this project, excavation of upland areas adjacent to the impacted floodplain is likely to be required for floodplain compensation. As no professionally estimated seasonal high water elevations were available for this study, the floodplain impacts could not be quantified. The floodplain impacts will need to be quantified during design, and the appropriate compensation areas identified.

The impacts to floodplains that are a result of bridge and cross drain capacities to convey water under SR 29 are proposed to be mitigated by the appropriate bridge and cross drain improvements.

4.3 POND SITE SIZING

Based upon an assessment of the existing conditions through field reviews, review of aerial and USGS maps and SCS soils data, preliminary offsite pond site alternatives were located for further investigation. Each site alternative was initially assessed for hydraulic feasibility based upon a SHGWT of the site estimated from preliminary SHGWT estimates, conveyance distance required, and the critical elevations upstream of the site. The critical elevations checked are at the low edge of pavement where one foot of clearance above the hydraulic grade line is desirable, and at the edge of pavement furthest from the pond.

Each offsite pond was sized to treat 2.5 inches of runoff from the proposed four-lanes, shoulders, and sidewalks. An additional 12 feet of paved area was included in the impervious calculation to account for turn lanes, median openings, and driveways to be conservative. The required treatment volume was increased by an additional 50% due to discharge to impaired water bodies.

Due to the CSM criteria imposed by SFWMD for the project area within proposed right of way Pond 9, to represent a typical pond site, was modeled in ICPR to test how much larger the pond would need to be to meet the CSM criteria. The result was to add an additional 25% pond site area increase (contingency) to accommodate the CSM criteria.

4.4 HYDRAULIC FEASIBILITY OF POND SITES

The hydraulic feasibility calculations for the offsite pond alternatives were based on rough estimates of the seasonal high water elevation at the outfall locations, as site seasonal high ground water elevations were not available. The pond sizing and hydraulic feasibility calculations will need to be updated after hand auger borings are obtained and seasonal high groundwater estimates are provided by the Geotechnical Engineer. The hydraulic feasibility calculations also calculate attenuation depth utilizing the NRCS equations. Refer to **Appendix 4.0** for the offsite pond hydraulic feasibility calculations.

4.5 BIOLOGICAL ASSESSMENT

Each site alternative was assessed by a Scientist to determine the presence of potential jurisdictional wetlands, and threatened and endangered species. The biological assessment for each of the pond site alternatives is included in **Appendix 6.0**. The results of the biological investigations will be discussed for each site alternative later in this report.

4.6 CONTAMINATION ASSESSMENT

A Level I hazardous materials investigation was conducted for each offsite pond alternative. The report is included as **Appendix 7.0.** The results of the investigation will be discussed later in this report.

4.7 CULTURAL RESOURCES ASSESSMENT

Each offsite pond alternative was assessed to determine the potential for significant cultural resources, including archaeological sites and historic structures. The report is included as **Appendix 8.0.** The results of these investigations will be discussed later in this report.

4.8 CONSTRUCTION AND ACQUISITION COSTS

The pond construction costs and land acquisition costs were not considered for this study. They will be assessed for each of the pond siting alternatives analyzed during the design phase.

4.9 EVALUATIONS AND RECOMMENDATIONS

The purpose of this study is to identify the general location of suitable pond site alternatives, estimate the site area required, and evaluate the environmental characteristics in the site vicinity.

The offsite pond alternatives were located as close to outfalls as practical, while avoiding wetlands wherever possible. Avoidance of wetlands is difficult or not possible in some basins due to the significant amount of wetlands within the hydraulically feasible locations within the basin. Where wetlands could not be avoided, it is recommended that isolated wetland treatment be considered. Berms could be constructed around the perimeter and the existing wetland be left in place in the interior of the pond, with the exception of inflow sumps to be constructed to allow the inflow pipe to enter the pond and the sump to collect incoming sediments.

Preliminary pond sizes were provided initially for the environmental assessments then further refined as the study progressed. Refinements were due to revisions in the typical section, seasonal high water estimates, the accommodation of a 50% increase in treatment to meet impaired water body criteria, and an additional 25% contingency to accommodate the CSM critera. As a result, the areas assessed as noted in **Appendix 6.0** are different that the final estimated site sizes.

The following subsections discuss in detail each alternative assessed. Refer to **Appendix 2.2** for the pond site alternatives maps that show the locations of each pond alternative assessed. A table summarizing the characteristics of each pond site alternative is provided for each project segment. The summary table provided for each segment is highlighted showing any features which may require additional investigation if pursued for design.

4.9.1 SEGMENT ONE

Segment One extends from approximately Station 188+50, just north of Favor Street and South of CR 80A, to approximately Station 500+00, north of SR 78. Located within the Caloosahatchee River Basin, discharge will be to lateral ditches and wetland systems that eventually discharge into the Caloosahatchee River. South of the river, one alternative, Pond A, was assessed to accommodate the improvements required to tie into the proposed SR 29

improvements adjacent to the south, and to facilitate the traffic movement from SR 29 onto the one way pairs proposed for Main Street and Bridge Street northward though downtown LaBelle.

No pond sites were proposed to accommodate the improvements from CR 80A to the bridges over the Caloosahatchee River as no new impervious area except turn lanes are proposed through downtown LaBelle, and an alternative for the new bridge was discussed and concurred with SFWMD.

The portion of the new bridge from the highpoint south towards LaBelle has been agreed with SFWMD to be treated with sediment and trash removal devices. There are several devices available by vendors or one can be designed by modifying a large manhole structure to accommodate a sump, baffles, and skimmers to retain the trash and sediments entering the system. Routine maintenance will be required to remove the trash and sediments and to maintain the effectiveness of the system. Refer to **Appendix 5.0** for examples of suitable devices for the removal of trash and sediments.

North of the river, nine pond sites were assessed within Segment One, Ponds 0, 1, 2, 3, 4, 5, 6-1, 6-2, and 7. These offsite ponds are proposed to accommodate the proposed widening of SR 29.

Each pond alternative is summarized in **Table E.1** included in the Executive Summary. Highlighted items require further investigation if the site alternative is selected. A detailed description for each pond alternative within Segment One follows.

4.9.1.1 POND A

Pond A is an approximately 1.6 acre site area located on the west side of SR 29. Pond A is also referred to as Pond South in the environmental assessments. The pond site is located north of and adjacent to the lateral ditch that serves as the outfall for the existing triple 29"x45" cross drain at Station 189+60. No easements for inflow or outflow pipes would be required for Pond A.

The contributing roadway basin to Pond A extends from the triple cross drain at Station 189+60 to CR 80A at approximately Station 200+00.

According to the NRCS web soil survey, the soils are mapped as Boca sand, with a hydrologic group A/D. The depth to lithic bedrock is approximately 24 to 40 inches, and the estimated depth to the water table is six to 18 inches. Boca sands are poorly drained soils located in flatwoods on marine terraces.

The site elevation is approximately elevation 18.0. A stain line was observed approximately half way up the barrel of the triple 29"x45" cross drain. Utilizing the available survey information, the stain line location is approximated to be at elevation 16.8. This elevation is approximately 1.2 feet lower than the site elevation, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, a 2.1 acre site is needed. As the available site area is 1.6 acres, this site alternative was given a **hydraulic feasibility** rating of **fair**. A vacant area of approximately 0.5 acres just south of CR 80A will be created as a result of splitting SR 29 into the one way pairs on Main Street and Bridge Street. Utilization of this vacant area to provide additional area for stormwater storage is recommended.

The Pond A site is within a residential area, and a residential mobile home is currently located on the site. There are **no wetlands** associated with this site.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

No protected species or suitable habitats were observed within the site.

A contamination assessment of the site ranked it as **medium** potential for **contamination**, based its location approximately 500 feet south of Handy Food Store #58. Handy Food Store has a history of discharges which have since been remediated. If

selected for design, a Level II contamination assessment should be conducted for the Pond A site.

4.9.1.2 POND 0

Pond 0 is an approximately 1.0 acre site area located on the west side of SR 29. The pond site is located north of and adjacent to the Caloosahatchee River. No easements for inflow or outflow pipes would be required for Pond 0.

The contributing roadway basin to Pond 0 extends from the high point of the bridge over the Caloosahatchee River, estimated to be at Station 282+00, to Buser Avenue at Station 293+30.

According to the NRCS web soil survey, the soils are mapped as Udifluvents, with no assigned hydrologic group. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is also greater than 80 inches. Due to the depth to the groundwater table, the soils were assumed to be hydrologic group A. Udifluvents are located in flood plains on marine terraces.

The site elevation is approximately elevation 13.0. The FEMA flood plain maps indicate the 100-year flood stage to be at elevation 9.0 in the adjacent river. This elevation is approximately 4.0 feet lower than the site elevation, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site is within open land, along the river bank of the Caloosahatchee River. There are **no wetlands** or surface waters located within this site.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the location of Pond 0 to the Caloosahatchee River, several listed bird species have the potential to occur within or adjacent to the site, including wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis. Suitable habitat is available within the open spaces of the site for the southeastern American kestrel, gopher tortoise, eastern indigo snake, gopher frog, Florida pine snake, and Florida mouse. No wildlife was observed within or adjacent to the Pond 0 site during the field evaluations.

A contamination assessment of the site ranked it as **medium** potential for **contamination** based its location adjacent to the Handy Food Store #82. Handy Food Store has a history of discharge. The discharge status is "on-going". There is a 24" to 30" air stripping tower located behind the gas station at the time of this study. If selected for design, a Level II contamination assessment should be conducted for the Pond 0 site.

4.9.1.3 POND 1

Pond 1 is an approximately 1.6 acre site area located on the east side of SR 29. The pond site is located south of and adjacent to the lateral ditch draining to the existing 8'x7' cross drain at Station 299+80. No easements for inflow or outflow pipes would be required for Pond 1.

The contributing roadway basin to Pond 1 extends from Buser Avenue at Station 293+30 to the ditch high point at approximately Station 311+10, and spans the limits of the existing contributing roadway basin to the 8'x7' cross drain. The roadway runoff conveyance system will be required to pipe from the north under the cross drain lateral ditch to enter Pond 1.

According to the NRCS web soil survey, the soils are mapped as Wabasso sand, with a hydrologic group C/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches. Wabasso sands are poorly drained soils located in flatwoods on marine terraces.

The site elevation is approximately elevation 12.0. A stain line was observed approximately half way up the barrel of the 8'x7' cross drain. Utilizing the available survey information, the stain line location is approximated to be at elevation 11.3. This elevation is approximately 0.7 feet lower than the site elevation, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

As the Pond 1 site is entirely comprised of a forested wetland system, it will have **significant wetland involvement** potential. The site consists of mixed wetland hardwoods dominated by swamp laurel, red bay, cabbage palm, and red maple.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat and close proximity to the Caloosahatchee River, several listed species have the potential to occur within Pond 1 including the mangrove fox squirrel, wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis. No wildlife was observed within or adjacent to the Pond 1 site during the field evaluations.

A contamination assessment of the site ranked it as **low** potential for **contamination**.

4.9.1.4 POND 2

Pond 2 is an approximately 1.9 acre site area located on the east side of SR 29. The pond site is located north of and adjacent to the lateral ditch that serves as the outfall for the 24" cross drain at Station 312+30. No easements for inflow or outflow pipes would be required for Pond 2.

The contributing roadway basin to Pond 2 extends from the ditch high point at approximately Station 311+10 to the ditch high point at approximately Station 333+20, and spans the limits of the existing contributing roadway basin to the existing 24" cross drain. The roadway runoff conveyance system will be required to pipe from the south under the cross drain outfall lateral ditch to enter Pond 2.

According to the NRCS web soil survey, the soils are mapped as Riviera fine sand, with a hydrologic group C/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero to six inches. Riviera fine sands are poorly drained soils located in drainageways on marine terraces.

The site elevation is approximately elevation 15.0. A stain line was observed approximately two-thirds the way up the barrel of the 24" cross drain. Utilizing the available survey information, the stain line location is approximated to be at elevation 14.5. This elevation is approximately 0.5 feet lower than the site elevation, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists of unimproved pasture that extends beyond the pond site on all sides. There are **no wetlands** or surface waters located within this site.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the southeastern American kestrel, Florida sandhill crane, Florida burrowing owl, gopher tortoise, eastern indigo snake, gopher frog, Florida pine snake, and Florida mouse have the potential to occur within Pond 2. No wildlife was observed within or adjacent to the Pond 2 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.1.5 POND 3

Pond 3 is an approximately 3.8 acre site area located on the east side of SR 29. The pond site is located 280 feet north of the lateral ditch that serves as the outfall for the triple 42" cross drain at Station 342+60. No easements for inflow or outflow pipes would be required for Pond 3.

The contributing roadway basin to Pond 3 extends from the ditch high point at approximately Station 333+20 to the ditch high point at approximately Station 374+50, and spans the limits of the existing contributing roadway basin to the existing triple 42" cross drain. The roadway runoff conveyance system will be required to pipe from the south under the cross drain outfall lateral ditch to enter Pond 3.

According to the NRCS web soil survey, the soils are mapped primarily as Oldsmar sand, with a hydrologic group C/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches. Oldsmar sands are poorly drained soils located in flatwoods on marine terraces. The southwest corner of the site extends into soils mapped as Floridana fine sand, depressional, with a hydrologic group C/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero inches with frequent ponding. Floridana fine sands are located in depressions on marine terraces.

The site elevation is approximately elevation 21.0. A stain line was observed approximately half way up the barrel of the triple 42" cross drain. Utilizing the available survey information, the stain line location is approximated to be at elevation 19.5. This elevation is approximately 1.5 feet lower than the site elevation, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists of improved pasture that extends beyond the pond site on southeast side. There are **no wetlands** or surface waters located within this site, however wetlands are located adjacent to the site.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the southeastern American kestrel, Florida sandhill crane, Florida burrowing owl, gopher tortoise, eastern indigo snake, gopher frog, Florida pine snake, and Florida mouse have the potential to occur within Pond 3. No wildlife was observed within or adjacent to the Pond 3 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.1.6 POND 4

Pond 4 is an approximately 3.3 acre site area located on the east side of SR 29. The pond site is located north of and adjacent to the lateral ditch that serves as the outfall for the existing double 42" cross drain at Station 380+45. No easements for inflow or outflow pipes would be required for Pond 4.

The contributing roadway basin to Pond 4 extends from the ditch high point at approximately Station 374+50 to the ditch high point at approximately Station 413+00, and spans the limits of the existing contributing roadway basin to the double 42" cross drain. The roadway runoff conveyance system will be required to pipe from the south under the cross drain outfall lateral ditch to enter Pond 4.

According to the NRCS web soil survey, the soils are mapped as Oldsmar sand, with a hydrologic group C/D. The depth to the restrictive layer is greater than 80 inches, and the

estimated depth to the water table is six to 18 inches. Oldsmar sands are poorly drained soils located in flatwoods on marine terraces.

The site elevation is approximately elevation 29.8. A stain line was observed approximately two-thirds the way up the barrel of the double 42" cross drain. Utilizing the available survey information, the stain line location is approximated at elevation 28.3. This elevation is approximately 1.5 feet lower than the site elevation, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists of improved pasture that extends beyond the pond site on all sides. There are **no wetlands** or surface waters located within this site.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the southeastern American kestrel, Florida sandhill crane, Florida burrowing owl, gopher tortoise, eastern indigo snake, gopher frog, Florida pine snake, and Florida mouse have the potential to occur within Pond 4. No wildlife was observed within or adjacent to the Pond 4 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.1.7 POND 5

Pond 5 is an approximately 3.8 acre site area located on the east side of SR 29. The pond site is located south of and adjacent to the North Okaloacoochee River. The existing crossing at SR 29 is a two span flat slab bridge, Bridge No. 050941, at Station 431+10. No easements for inflow or outflow pipes would be required for Pond 5.

The contributing roadway basin to Pond 5 extends from the ditch high point at approximately Station 413+00 to the ditch high point at approximately Station 457+20, and spans the limits of the existing contributing roadway basin to the North Okaloacoochee River. The roadway runoff conveyance system will be required to pipe from the north under the waterway to enter Pond 5.

According to the NRCS web soil survey, the soils are mapped primarily as Immokalee sand, with a hydrologic group B/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches. Immokalee sands are poorly drained soils located in flatwoods on marine terraces. The northwest corner of the site extends into soils mapped as Malabar fine sand, with a hydrologic group A/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero to 12 inches. Malabar fine sands are poorly drained soils located in drainageways on marine terraces.

The site elevation is approximately elevation 33.6. The downstream impoundment elevation is at approximately elevation 32.6. This elevation is approximately 1.0 foot lower than the site elevation, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists of improved pasture that extends beyond the pond site on all sides. There are **no wetlands** or surface waters located within this site.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the southeastern American kestrel, Florida sandhill crane, Florida burrowing owl, gopher tortoise, eastern indigo snake, gopher frog, Florida pine snake,

and Florida mouse have the potential to occur within Pond 5. No wildlife was observed within or adjacent to the Pond 5 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.1.8 POND 6-1

Pond 6-1 is an approximately 3.2 acre site area located on the east side of SR 29. The pond site is located north of and adjacent to the lateral ditch that serves as the outfall for the existing 30" cross drain at Station 473+00. No easements for inflow or outflow pipes would be required for Pond 6-1.

The contributing roadway basin to Pond 6-1 extends from the ditch high point at approximately Station 457+20 to the bridge high point at Station 482+00. The roadway basin contributing to the pond extends 220 feet into Basin 7 to avoid having to pipe that portion of Basin 7 under the waterway to Pond 7.

According to the NRCS web soil survey, the soils are mapped primarily as Pople fine sand, with a hydrologic group B/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches. Pople fine sands are poorly drained soils located in flats on marine terraces. The western edge of the site encroaches into soils mapped as Gator muck, depressional, with a hydrologic group C/D.

The site elevation is approximately elevation 35.8. The seasonal high water appears to be at the crown of the 30" cross drain. Utilizing the available survey information, the crown is approximated to be at elevation 33.4. This elevation is approximately 2.4 feet lower than the site elevation, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**. It should be noted however that the estimated seasonal high elevation at the outfall is nearly one foot below the low range estimated for the site seasonal high ground water table. The cross drain has flared end sections for end treatments therefore there is no headwall to obtain good stain

line measurements. It is possible that the assumption of the crown elevation may be low at this location, which would result in a larger site required for the pond.

The site consists primarily of upland mixed hardwoods. Approximately five percent of the western portion of the pond site is comprised of wetland scrub habitat. The site is also adjacent to freshwater marsh habitat. It is recommended that the site be reconfigured to minimize wetland impacts, and is ranked **medium** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the mangrove fox squirrel, wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis have the potential to occur within Pond 6-1. No wildlife was observed within or adjacent to the Pond 6-1 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.1.9 POND 6-2

Pond 6-2 is a second alternative that was assessed for Basin 6 with a slightly different configuration than Pond 6-1 to incorporate an isolated wetland. Pond 6-2 is an approximately 3.7 acre site area encompassing the isolated wetland, and is located approximately 300 feet east of SR 29. The pond site is located north of the lateral ditch that serves as the outfall for the existing 30" cross drain at Station 473+00. A 0.2 acre easement for inflow or outflow pipes would be required for Pond 6-2.

The contributing roadway basin to Pond 6-2 extends from the ditch high point at approximately Station 457+20 to the bridge high point at Station 482+00. The roadway basin contributing to the pond extends 220 feet into Basin 7 to avoid having to pipe that portion of Basin 7 under the waterway to Pond 7.

According to the NRCS web soil survey, the soils are mapped primarily as Malabar fine sand, with a hydrologic group A/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero to 12 inches. Malabar fine sands are poorly drained soils located in drainageways on marine terraces. The center of the site is open water.

The site elevation is unknown as it is outside of the range of available survey data, but is less than elevation 35 per the USGS topo quad maps. The seasonal high water of the site will need to be estimated by a biologist during design. This site was identified as an opportunity to provide isolated wetland treatment. A berm would be required around the perimeter, and an inflow sump is required for the inflow pipe. The interior portion of the wetland could be incorporated into the design to remain undisturbed. Isolated wetland alternatives typically result in better hydraulic feasibility as the treatment occurs below the seasonal high water elevation for isolated wetland treatment. Based on this logic, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists primarily of freshwater marsh habitat in the center, fringed by upland mixed hardwoods. It is recommended that the site be configured to incorporate the isolated wetland with as much of it to remain undisturbed as possible, and is ranked **high** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the mangrove fox squirrel, wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis have the potential to occur within Pond 6-1. No wildlife was observed within or adjacent to the Pond 6-1 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.1.10 POND 7

Pond 7 is an approximately 5.4 acre site area located on the east side of SR 29. The pond site is located approximately 600 feet north of an un-named waterway. The existing crossing at SR 29 appears to be a one span flat slab bridge at Station 482+00. With a span width less than 20 feet, the bridge does not have an assigned bridge number, and is noted as a box culvert on the straight line diagram. No easements for inflow or outflow pipes would be required for Pond 7.

The contributing roadway basin to Pond 7 extends from the bridge high point at Station 482+00 to the ditch high point at Station 527+00. The roadway basin contributing to the pond is 220 feet less than what contributes to Basin 7 in the existing condition to avoid having to pipe the portion of Basin 7 south of the bridge under the waterway to Pond 7. The 220 feet of roadway not included in Pond 7 will be routed to Pond 6 for attenuation and treatment.

According to the NRCS web soil survey, the soils are mapped primarily as Immokalee sand, with a hydrologic group B/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches. Immokalee sands are poorly drained soils located in flatwoods on marine terraces.

The site elevation is less than elevation 35.2. The downstream impoundment elevation is at approximately elevation 34.0. The distance from the top of the bridge to the stain line was measured. Utilizing the available survey information, the stain line is approximated to be at elevation 33.9. This elevation is approximately 1.3 foot lower than the site elevation, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists mostly of improved pasture and a sod farm on the eastern portion. A drainage ditch runs through the east side of the pond. Due to the presence of the drainage ditch, the site is ranked **low** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the southeastern American kestrel, Florida sandhill crane, Florida burrowing owl, gopher tortoise, eastern indigo snake, gopher frog, Florida pine snake, and Florida mouse have the potential to occur within Pond 7. Within the drainage ditch, several listed bird species may potentially occur including wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis. No wildlife was observed within or adjacent to the Pond 7 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2 SEGMENT TWO

Segment Two extends from approximately Station 500+00, north of SR 78 to Station 950+00 at CR 74. Located within the Caloosahatchee River Basin, discharge will be to lateral ditches and wetland systems that eventually discharge into the Caloosahatchee River.

Eleven pond sites were assessed within Segment Two, Ponds 8A, 8B, 9, 10, 11A, 11B, 12-13A, 13B, 14A, 14B-15-1 and 14B-15-2. These offsite ponds are proposed to accommodate the proposed widening of SR 29.

Each pond alternative is summarized in **Table E.1** included in the Executive Summary. Highlighted items require further investigation if the site alternative is selected. A detailed description for each pond alternative within Segment Two follows.

4.9.2.1 POND 8A

Pond 8A is an approximately 4.1 acre site area located on the west side of SR 29. The pond site is located approximately 250 feet south of Lone Pine Creek. The existing crossing at SR 29 is a three span flat slab bridge, Bridge No. 050035, at Station 582+60. No easements for inflow or outflow pipes would be required for Pond 8A.

The contributing roadway basin to Pond 8A extends from the ditch high point at Station 527+00 to the center of the bridge at Station 582+60. The roadway basin contributing to Pond 8A spans only the portion of Basin 8 located south of the bridge to avoid piping under the creek.

According to the NRCS web soil survey, the soils are mapped as Oldsmar sand, with a hydrologic group C/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches. Oldsmar sands are poorly drained soils located in flatwoods on marine terraces.

The site elevation is approximately elevation 31.8. The downstream impoundment elevation is at approximately elevation 31.8. The distance from the top of the bridge to the stain line was measured. Utilizing the available survey information, the stain line is approximated at elevation 32.8. On June 2, 2010 the water surface was measured at elevation 31.9, and is assumed to be a good approximation of the seasonal high water elevation. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists primarily of improved pasture with a freshwater marsh extending into the southeastern portion of the pond site. It is recommended that the site be reconfigured to avoid wetlands, and is ranked **low** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, several listed bird species have the potential to occur within the freshwater marsh portion of Pond 8A including the wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis. Within the improved pasture protion of the pond site, the southeastern American kestrel, Florida sandhill crane, Florida burrowing owl, gopher tortoise, eastern indigo snake, gopher frog, Florida pine snake, and Florida mouse have the potential to occur within Pond 8A. No wildlife was observed within or adjacent to the Pond 8A site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.2 POND 8B

Pond 8B is an approximately 2.5 acre site area located on the east side of SR 29. The pond site is located approximately 120 feet north of Lone Pine Creek. The existing crossing at SR 29 is a three span flat slab bridge, Bridge No. 050035, at Station 582+60. No easements for inflow or outflow pipes would be required for Pond 8B.

The contributing roadway basin to Pond 8B extends from the center of the bridge at Station 582+60 to the ditch high point at Station 604+60. The roadway basin contributing to Pond 8B spans only the portion of Basin 8 located north of the bridge to avoid piping under the creek.

According to the NRCS web soil survey, the soils are mapped as Oldsmar sand, with a hydrologic group C/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches. Oldsmar sands are poorly drained soils located in flatwoods on marine terraces.

The site elevation is approximately elevation 31.8. The downstream impoundment elevation is at approximately elevation 31.8. The distance from the top of the bridge to the stain line was measured. Utilizing the available survey information, the stain line is

approximated to be at elevation 32.8. On June 2, 2010 the water surface was measured at elevation 31.9, and is assumed to be a good approximation of the seasonal high water elevation. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists of improved pasture. A forested wetland is adjacent to the south side of the pond site. There are **no wetlands** or surface waters located within this site.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the southeastern American kestrel, Florida sandhill crane, Florida burrowing owl, gopher tortoise, eastern indigo snake, gopher frog, Florida pine snake, and Florida mouse have the potential to occur within Pond 8B. No wildlife was observed within or adjacent to the Pond 8B site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.3 POND 9

Pond 9 is an approximately 3.5 acre site area located on the east side of SR 29. The pond site is located north of and adjacent to the lateral ditch that serves as the outfall for the existing triple 30" cross drain at Station 625+00. No easements for inflow or outflow pipes would be required for Pond 9.

The contributing roadway basin to Pond 9 extends from the ditch high point at approximately Station 604+60 to the ditch high point at approximately Station 656+60, and spans the limits of the existing contributing roadway basin to the triple 30" cross drain. The roadway runoff conveyance system will be required to pipe from the south under the cross drain outfall lateral ditch to enter Pond 9.

According to the NRCS web soil survey, the soils are mapped as Malabar fine sand, with a hydrologic group A/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero to 12 inches. Malabar fine sands are poorly drained soils located in drainageways on marine terraces.

The site elevation is approximately elevation 32.2. A staked wetland line was shown in the available survey data at approximately elevation 30.8, and was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists of improved pasture in the southeast portion, freshwater marsh in the northwest portion, and wet prairie in the remaining portion of the site. This site is ranked **high** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the southeastern American kestrel, Florida sandhill crane, Florida burrowing owl, gopher tortoise, eastern indigo snake, gopher frog, Florida pine snake, and Florida mouse have the potential to occur within the improve pasture portion and or the wet prairie portion of the pond site. Within the freshwater marsh portion of Pond 9, the wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis have the potential to occur. No wildlife was observed within or adjacent to the Pond 9 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.4 POND 10

Pond 10 is an approximately 3.2 acre site area located on the east side of SR 29. The pond site is located north of and adjacent to the lateral ditch that serves as the outfall for the existing triple 36" cross drain at Station 664+00. No easements for inflow or outflow pipes would be required for Pond 10.

The contributing roadway basin to Pond 10 extends from the ditch high point at approximately Station 656+60 to the ditch high point at approximately Station 675+00, and spans the limits of the existing contributing roadway basin to the triple 36" cross drain. The roadway runoff conveyance system will be required to pipe from the south under the cross drain outfall lateral ditch to enter Pond 10.

According to the NRCS web soil survey, the soils are mapped as Malabar fine sand, with a hydrologic group A/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero to 12 inches. Malabar fine sands are poorly drained soils located in drainageways on marine terraces.

The site elevation is approximately elevation 33.2. The seasonal high water appears to be above the crown of the triple 36" cross drain. Utilizing the available survey information, the crown is approximated to be at elevation 32.2. This elevation is approximately 1.0 feet lower than the site elevation. Since the site is a wet prairie, the site elevation estimate was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists of wet prairie that extends in all directions from the site. This site is ranked **significant** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for **listed species**. Due to the availability of suitable habitat, the Florida sandhill crane and eastern indigo snake have the potential to occur within the pond site. No wildlife was observed within or adjacent to the Pond 10 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.5 POND 11A

Pond 11A is an approximately 2.6 acre site area located on the east side of SR 29. The pond site is located approximately 200 feet south of Cypress Branch. The existing crossing at SR 29 is a ten span flat slab bridge, Bridge No. 050033, at Station 696+00. No easements for inflow or outflow pipes would be required for Pond 11A.

The pond size is based on the assumption that the critical low edge elevations of the roadway within the basin will be raised at least one foot. Without raising the roadway, the estimated size for Pond 11A is 11.3 acres. Basin 11 has a history of roadway overtopping, and the analysis performed for the bridge replacement recommends that the bridge be raised. Refer to the Location Hydraulics Report for additional information.

The contributing roadway basin to Pond 11A extends from the ditch high point at Station 675+00 to the center of the bridge at Station 696+00. The roadway basin contributing to Pond 11A spans only the portion of Basin 11 located south of the bridge to avoid piping under the waterway.

According to the NRCS web soil survey, the soils are mapped as Pineda fine sand, with a hydrologic group C/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero to 12 inches. Pineda fine sands are poorly drained soils located in swamps within floodplains on marine terraces.

The site elevation is less than elevation 33.0. On June 2, 2010 the water surface at the bridge was measured at elevation 34.0, and is assumed to be a good approximation of the seasonal high water elevation. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good** if the road is raised a minimum of one foot, otherwise the hydraulic feasibility would be fair.

The site consists of mixed wetland hardwoods that extend beyond the site on all sides. This site is ranked **significant** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, several listed species have the potential to occur within the site including the mangrove fox squirrel, wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis. No wildlife was observed within or adjacent to the Pond 11A site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.6 POND 11B

Pond 11B is an approximately 4.7 acre site area located on the east side of SR 29. The pond site is located approximately 200 feet north of Cypress Branch. The existing crossing at SR 29 is a ten span flat slab bridge, Bridge No. 050033, at Station 696+00. No easements for inflow or outflow pipes would be required for Pond 11B.

The pond size is based on the assumption that the critical low edge elevations of the roadway within the basin will be raised at least one foot. Without raising the roadway, the estimated size for Pond 11B is 7.9 acres. Basin 11 has a history of roadway

overtopping, and the analysis performed for the bridge replacement recommends that the bridge be raised. Refer to the Location Hydraulics Report for additional information.

The contributing roadway basin to Pond 11B extends from the center of the bridge at Station 696+00 to the ditch high point at Station 764+60. The roadway basin contributing to Pond 11B spans only the portion of Basin 11 located north of the bridge to avoid piping under the waterway.

According to the NRCS web soil survey, the soils are mapped as Malabar fine sand, high, with a hydrologic group A/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches. Malabar fine sands are poorly drained soils located in drainageways on marine terraces.

The site elevation is assumed to be less than elevation 33.0. On June 2, 2010 the water surface at the bridge was measured at elevation 34.0, and is assumed to be a good approximation of the seasonal high water elevation. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good** if the road is raised a minimum of one foot, otherwise the hydraulic feasibility would be fair.

The site consists primarily of mixed wetland hardwoods, with a freshwater marsh within the west corner of the site. This site is ranked **significant** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, several listed species have the potential to occur within the site including the mangrove fox squirrel, wood stork, limpkin, little blue heron, snowy egret, tricolored

heron, and white ibis. No wildlife was observed within or adjacent to the Pond 11B site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.7 POND 12-13A

Pond 12-13A is an approximately 4.2 acre site area located on the east side of SR 29. The pond site is located approximately 400 feet south of the lateral ditch that serves as the outfall for the existing quadruple 15" cross drain at Station 801+00. No easements for inflow or outflow pipes would be required for Pond 12-13A.

The contributing roadway basin to Pond 12-13A extends from the ditch high point at approximately Station 764+60 to the bridge high point at Station 827+80. The roadway basin contributing to the pond extends 880 feet into Basin 13 to avoid having to pipe that portion of Basin 13 under the waterway to Pond 13B.

According to the NRCS web soil survey, the soils are mapped as Myakka sand, with a hydrologic group B/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches. Myakka sands are poorly drained soils located in flatwoods on marine terraces.

The site elevation is approximately elevation 35.2. The seasonal high water appears to be at the top of the headwall on the upstream side of the quadruple 15" cross drain. The cross drain was determined to be undersized. The estimated site elevation was utilized as the control elevation estimate for the hydraulic feasibility calculations. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists primarily of shrub and brushland habitat. There are **no wetlands** or surface waters located within this site.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for **listed species**. Due to the availability of suitable habitat, the eastern indigo snake has the potential to occur within the pond site. No wildlife was observed within or adjacent to the Pond 12-13A site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.8 POND 13B

Pond 13B is an approximately 3.5 acre site area located on the east side of SR 29. The pond site is located approximately 470 feet north of York Branch. The existing crossing at SR 29 is a three span flat slab bridge, Bridge No. 050032, at Station 827+80. No easements for inflow or outflow pipes would be required for Pond 13B.

The contributing roadway basin to Pond 13B extends from the center of the bridge at Station 827+80 to the ditch high point at Station 870+70. The roadway basin contributing to Pond 13B spans only the portion of Basin 13 located north of the bridge to avoid piping under the waterway.

According to the NRCS web soil survey, the soils are mapped primarily as Basinger fine sand, with a hydrologic group A/D. Malabar fine sand, with a hydrologic group A/D, is also present along the southwest edge of the site. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero to 12 inches. Basinger and Malabar fine sands are poorly drained soils located in drainageways on marine terraces.

The site elevation is assumed to be less than elevation 35.8. On June 2, 2010 the water surface at the bridge was measured at elevation 37.5, and is assumed to be a good

approximation of the seasonal high water elevation. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists of wet prairie. This site is ranked **significant** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for **listed species**. Due to the availability of suitable habitat, the Florida sandhill crane and eastern indigo snake have the potential to occur within the pond site. No wildlife was observed within or adjacent to the Pond 13B site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.9 POND 14A

Pond 14A is an approximately 3.8 acre site area located on the east side of SR 29. The pond site is located approximately 350 feet south of Turkey Branch. The existing crossing at SR 29 is a two span flat slab bridge, Bridge No. 050031, at Station 911+00. No easements for inflow or outflow pipes would be required for Pond 14A.

The contributing roadway basin to Pond 14A extends from the ditch high point at Station 870+70 to the center of the bridge at Station 911+00. The roadway basin contributing to Pond 14A spans only the portion of Basin 14 located south of the bridge to avoid piping under the waterway.

According to the NRCS web soil survey, the soils are mapped as Myakka sand, with a hydrologic group B/D. The depth to the restrictive layer is greater than 80 inches, and the

estimated depth to the water table is six to 18 inches. Myakka sands are poorly drained soils located in flatwoods on marine terraces.

The site elevation is approximately elevation 38.8. On June 2, 2010 the water surface at the bridge was measured at elevation 37.9, and is assumed to be a good approximation of the seasonal high water elevation. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists primarily of wet prairie. A drainage ditch extends north and south through the site. This site is ranked **significant** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the Florida sandhill crane and eastern indigo snake have the potential to occur within the wet prairie portion of the site. Within the drainage ditch, the wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis have the potential to occur. No wildlife was observed within or adjacent to the Pond 14A site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.10 POND 14B-15-1

Pond 14B-15-1 is an approximately 6.2 acre site area located on the west side of SR 29. The pond site is located north of and adjacent to Turkey Branch. The existing crossing at SR 29 is a two span flat slab bridge, Bridge No. 050031, at Station 911+00. No easements for inflow or outflow pipes would be required for Pond 14B-15-1.

The contributing roadway basin to Pond 14B-15-1 extends from the center of the bridge at Station 911+00 to CR 74 at Station 950+20. The roadway basin contributing to Pond 14B-15-1 spans only the portion of Basin 14 located north of the bridge to avoid piping under the waterway, and all of Basin 15. The portion of Basin 15 north of the existing 36" cross drain at station 941+00 will need to be piped under the lateral ditch to the pond. This cross drain serves as a relief structure for the bridge crossing at Turkey Branch therefore it contributes to the same wetland system.

According to the NRCS web soil survey, the soils are mapped as Basinger fine sand, with a hydrologic group A/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero to 12 inches. Basinger fine sands are poorly drained soils located in drainageways on marine terraces.

The site elevation is approximately elevation 38.8. On June 2, 2010 the water surface at the bridge was measured at elevation 37.9, and is assumed to be a good approximation of the seasonal high water elevation. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists primarily of wet prairie that extends beyond the site from all sides. A drainage ditch runs through the southeast portion of the site. This site is ranked **significant** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the Florida sandhill crane and eastern indigo snake have the potential to occur within the wet prairie portion of the site. Within the drainage ditch, the wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis have the potential to occur. No wildlife was observed within or adjacent to the Pond 14B-15-1 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.2.11 POND 14B-15-2

Pond 14B-15-2 is a second alternative that was assessed with a slightly different configuration than Pond 14B-15-1 to incorporate an existing reservoir. Pond 14B-15-2 is an approximately 6.2 acre site area located on the west side of SR 29. The pond site is located approximately 300 feet north of Turkey Branch. The existing crossing at SR 29 is a two span flat slab bridge, Bridge No. 050031, at Station 911+00. No easements for inflow or outflow pipes would be required for Pond 14B-15-2.

The contributing roadway basin to Pond 14B-15-2 extends from the center of the bridge at Station 911+00 to CR 74 at Station 950+20. The roadway basin contributing to Pond 14B-15-1 spans only the portion of Basin 14 located north of the bridge to avoid piping under the waterway, and all of Basin 15. The portion of Basin 15 north of the existing 36" cross drain at station 941+00 will need to be piped under the lateral ditch to the pond. This cross drain serves as a relief structure for the bridge crossing at Turkey Branch therefore it contributes to the same wetland system.

According to the NRCS web soil survey, the soils are mapped as Basinger fine sand, with a hydrologic group A/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is zero to 12 inches. Basinger fine sands are poorly drained soils located in drainageways on marine terraces. Open water is mapped within the northwest portion of the site.

The site elevation is approximately elevation 38.8. On June 2, 2010 the water surface at the bridge was measured at elevation 37.9, and is assumed to be a good approximation of the seasonal high water elevation. Based on the results of the hydraulic feasibility calculations, this site alternative was given a **hydraulic feasibility** rating of **good**.

The site consists primarily of wet prairie with a reservoir within the northwest half of the site. A drainage ditch runs through the southeast portion of the site. This site is ranked **significant** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, the Florida sandhill crane and eastern indigo snake have the potential to occur within the wet prairie portion of the site. Within the reservoir, the American alligator has the potential to occur. No wildlife was observed within or adjacent to the Pond 14B-15-2 site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.3 SEGMENT THREE

Segment Three extends from Station 950+00 at CR 74 to Station 992+00 at US 27, and includes an interchange at CR 74, improvements along CR 74, and new alignment for SR 29 to US 27. The west side of SR 29, and a 23.4 acre basin contributing to the existing 24" cross drain at Station 974+10 within Segment Three is located within the Fisheating Creek Basin, where discharge will be to lateral ditches and wetland systems that eventually discharge into Fisheating Creek. The area east of the 24" cross drain basin, including the area where the new alignment of SR 29 to US 27 is proposed, contributes to the Caloosahatchee River Basin.

Two pond sites were assessed within Segment Three, Ponds 16A and Pond 16-17. These offsite ponds are proposed to accommodate the proposed widening of SR 29 and CR 74, and the new alignment associated with the interchange and the relocation of the intersection of SR 29 with US 27.

Each pond alternative is summarized in **Table E.1** included in the Executive Summary. Highlighted items require further investigation if the site alternative is selected. A detailed description for each pond alternative within Segment Three follows.

4.9.3.1 POND 16A

Pond 16A is an approximately 3.8 acre site area located on the north side of CR 74, west of SR 29. The pond site is located east of and adjacent to an outfall ditch. No easements for inflow or outflow pipes would be required for Pond 16A.

Pond 16A is sized to accommodate the CR 74 improvements west of SR 29. The pond size is a very rough estimate due to the lack of survey information needed to estimate the site elevation and seasonal high ground water table elevation. As it is located within the Fisheating Creek Basin, it does need to provide an additional 50% treatment volume to meet the impaired water body criteria, but it does not need an additional 25% area increase contingency to meet CSM limiting discharge criteria.

According to the NRCS web soil survey, the soils are primarily mapped as Immokalee sand, with a hydrologic group B/D. Along the western edge, the site is mapped as Basinger fine sand, with a hydrologic group A/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is six to 18 inches within the Immokalee soils and zero to 12 inches within the Basinger soils. Immokalee sands are poorly drained soils located in flatwoods on marine terraces. Basinger fine sands are poorly drained soils located in drainageways on marine terraces.

The site elevation is unknown, but is less than elevation 40 according to the USGS topo quad maps. It is assumed this site alternative has a **hydraulic feasibility** rating of **good** due to its proximity to the drainage ditch.

The site consists primarily of wet prairie that extends beyond the site from all sides. This site is ranked **significant** for **wetland involvement** potential.

There are **no historical structures** associated with this site.

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for **listed species**. Due to the availability of suitable habitat, the Florida sandhill crane and eastern indigo snake have the potential to occur within the site. No wildlife was observed within or adjacent to the Pond 16A site during the field evaluations.

A contamination assessment of the site ranked it as **no** potential for **contamination**.

4.9.3.2 POND 16-17

Pond 16-17 is an approximately 68.8 acre site area located on the east side of SR 29 and south side of US 27. The pond site encompasses an existing borrow pit. No easements for inflow or outflow pipes would be required for Pond 16-17. Two outfalls could be incorporated, one to the US 27 ditch and the other to the east, to balance the attenuation to both the Fisheating Creek and Caloosahatchee River Basins, as both basins are involved for the proposed roadway improvements contributing runoff to Pond 16-17.

Pond 16-17 will be utilized to accommodate the CR 74 improvements east of SR 29, and the realignment of SR 29 with US 27. The pond size is large as it entirely encompasses an existing borrow pit.

According to the NRCS web soil survey, the site is mapped as open water. Adjacent soils are primarily mapped as Pomello fine sand, with a hydrologic group A. Immokalee sand is also mapped adjacent along the south eastern edge, with a hydrologic group B/D. The depth to the restrictive layer is greater than 80 inches, and the estimated depth to the water table is 24 to 42 inches within the Pomello soils and six to 18 inches within the Immokalee soils. Pomello fine sands are moderately well drained soils located in rises on marine terraces. Immokalee sands are poorly drained soils located in flatwoods on marine terraces.

The site elevation is unknown, but is higher than elevation 40 according to the USGS topo quad maps. It is assumed this site alternative has a **hydraulic feasibility** rating of **good** due to its large size.

The site since being excavated has become a freshwater marsh habitat. This site is ranked **significant** for **wetland involvement** potential.

There are **no historical structures** associated with this site, however it is located adjacent to one historic linear resource, the Atlantic Coast Line (South Central Florida Express) Railroad (8GL456).

The site was rated to have **low archaeological potential**.

The site is suitable **habitat** for a variety of **listed species**. Due to the availability of suitable habitat, several listed bird species have the potential to occur within the freshwater marsh including the wood stork, limpkin, little blue heron, snowy egret, tricolored heron, and white ibis. No wildlife was observed within or adjacent to the Pond 16-17 site during the field evaluations.

A contamination assessment of the site ranked it as **low** potential for **contamination** due its location adjacent to a railroad corridor.

4.10 CONCLUSION

This Pond Siting Report identifies potential offsite pond alternatives to be considered during the design of SR 29. The study corridor begins south of CR 80A in Hendry County and ends at US 27 in Glades County. The entire corridor is located within impaired water bodies, and the majority of the corridor is required to meet CSM limiting discharge criteria for all proposed right of way areas including pond sites. It is our recommendation to incorporate dry shallow swales into the typical section to provide some dry retention treatment, and to utilize offsite ponds for

the remainder of the treatment and attenuation required. The acquisition of additional right of way is anticipated for both the roadway and offsite ponds.