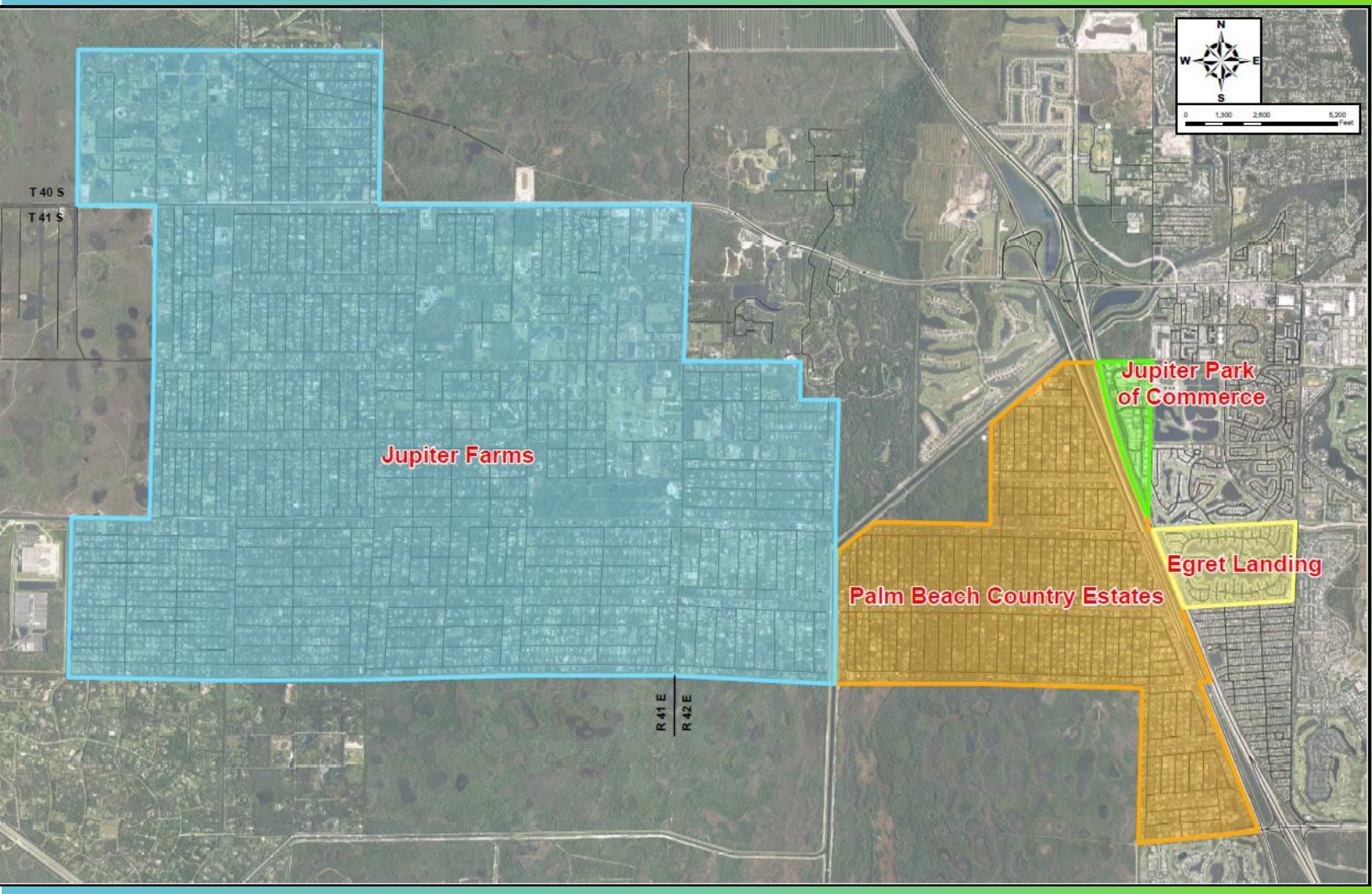
AECOM

September 20, 2018

South Indian River Water Control District

District Engineer's Annual Report

South Indian River Water Control District™



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Water Control District℠

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September 2018

Introduction

South Indian River Water Control District (SIRWCD or the District) is positioned as a strategic entity in the planning and management of water resources for Northern Palm Beach County. SIRWCD has an obligation to its landowners and to the surrounding area due to this strategic location (*Figure 1)* within naturally sensitive conservation areas. Clearly, SIRWCD is not an entity that can just look within its boundaries with regard to its authorized activities. To the contrary, a major portion of SIRWCD's activities require participation in programs that look at infrastructure needs and ecosystem management for the overall area and region. The District and its landowners share in the continued responsibility of being good stewards in maintaining compatibility with these natural systems.

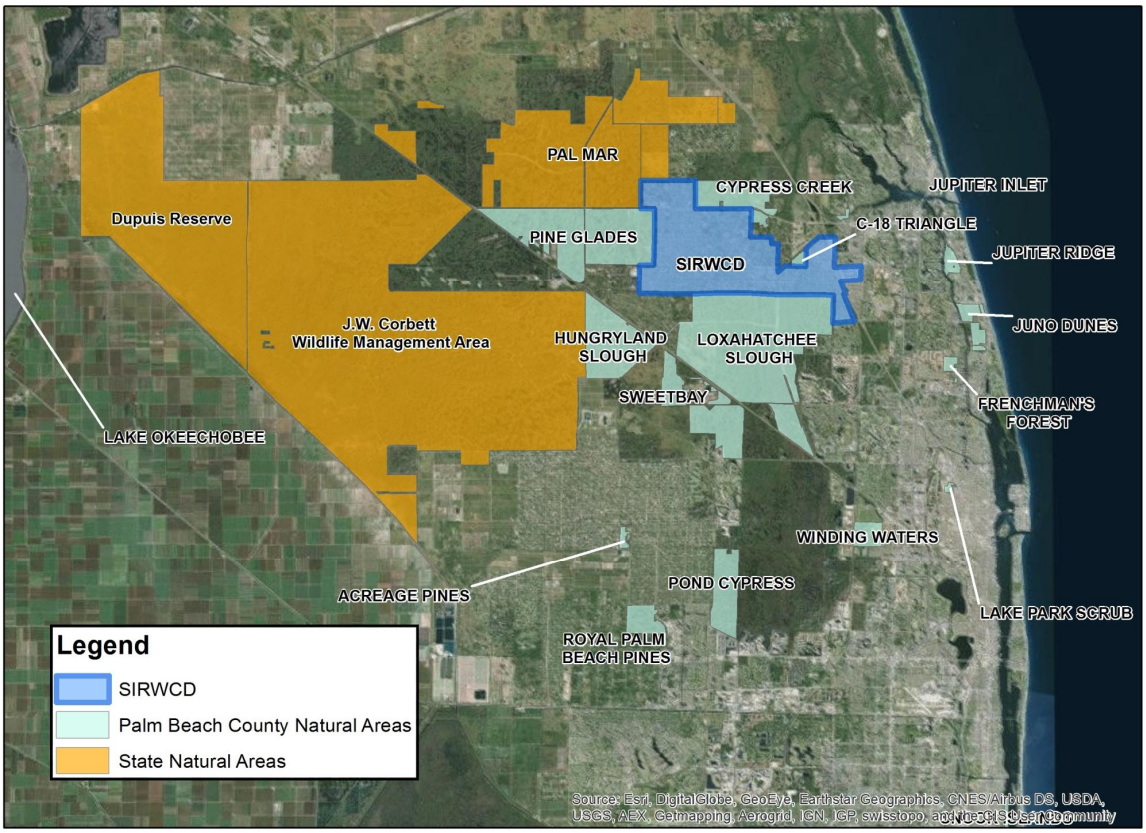

Figure 1. District Location

Existing and future water management issues evolve from plans being discussed by various regulatory agencies and/or committees with special interests in the overall future of water resources in Northern Palm Beach County, in Southern Martin County, the Loxahatchee River Basin and/or the Wild and Scenic portion of the Northwest Fork of the Loxahatchee River. These issues include planning and constructing new water management facilities that would allow for interbasin transfers of surplus water supplies to the Loxahatchee Slough, modifying existing water control facilities to enhance management plans for the Loxahatchee Slough, the establishment of minimum flows and levels for the Northwest Fork of the Loxahatchee River, and future improvements to the works of the District that will enhance and integrate the District's water management operations into the regional water management system.

Over the course of the year, the District has been investigating ways to increase storage and provide additional water quality treatment through its existing facilities. The District Engineer assists the Operations Manager in activities such as culvert replacements or renewals, drainage easement clearing, swale shaping, and roadway maintenance to aid in improving the District's level of service to its landowners. In addition, the engineer is evaluating other opportunities for possible capital improvements in the future.

Each year, it is appropriately restated and recognized in the engineering report that the SIRWCD Board of Supervisors, through its policies and procedures, is responsible for formulating direction regarding District operations and intergovernmental issues. This is accomplished through a respected structure in which the District is managed through its Board of Supervisors and supporting staff. The Board of Supervisors establishes policy and provides direction to staff concerning budget, priorities, relationship with other public entities, and landowner issues. Staff is responsible for implementing Board policy. Accordingly, staff responds pursuant to the Board's direction. Engineering tasks continue to be formulated to respond to the Board of Supervisors by implementing their policies and directives, as well as supporting the General Manager in resolving various landowner issues. The relationship between the Board of Supervisors and District staff has been extremely effective in both the delivery of services to the residents and landowners within the District, and prospective management in response to requirements that are imposed upon the District by other governmental entities.

With regard to the current status of the District, to the best of my knowledge and belief, the District is in compliance with all regulatory requirements that affect works of the District and their operation, and the works of the District continue to be operated and maintained in a manner that achieves the available level of service. A separate report prepared by the District's Operations Manager discussing operation and maintenance of District facilities is included as an appendix to this document.

Capital Improvements

Nineteenth Plan of Improvement

Based on a landowner initiative, a referendum was prepared by SIRWCD and verified by the Palm Beach County Supervisor of Elections to implement the application of Palm Beach County Standard asphalt on the petitioners' roadway surfaces as a roadway improvement project. On February 16, 2017, the Board of Supervisors authorized staff to develop the Nineteenth (19th) Plan of Improvement. A public hearing was held May 18, 2017 where the resolution was approved and the Board authorized the Engineer's Report for the 19th Plan of Improvement. The public hearing for the Engineer's Report and the Plan of Improvement was held June 29, 2017 and the plan was approved. This plan includes the Unit of Development RI-19, which consists of the application of Palm Beach County Standard asphalt on approximately 2.3 miles of roadway within the District. These roads are listed as follows and are shown in *Figure 3*.

- 76th Trail N between 160th Lane N and 162nd Court N
- 76th Trail N between 163rd Court N and 165th Street N
- 78th Drive N between 165th Street N and 167th Court N
- 154th Court N between 75th Avenue N and 81st Terrace N
- 159th Court N between 78th Drive N and 83rd Way N
- 160th Street N between 72nd Drive N and 75th Avenue N and 72nd Drive N from 160th Street N to 160th Lane N
- 175th Road N between Jupiter Farms Road and West End

The plan was submitted to South Florida Water Management District (SFWMD) for review and approval and has been approved. Construction documents were prepared for the project, and the project was advertised to bid on April 15, 2018 with bids submitted by potential contractors on May 15, 2018. Bids were received on May 15, 2018, and the board awarded the project on May 17, 2018. Construction began on July 9, 2018 (*Figure 2*) and is anticipated to be complete January, 2019. The preliminary estimate of probable construction costs for this plan is $901,000. The project was awarded at $858,054. The project is anticipated to be complete in January 2019.

Figure 2. Current Paving

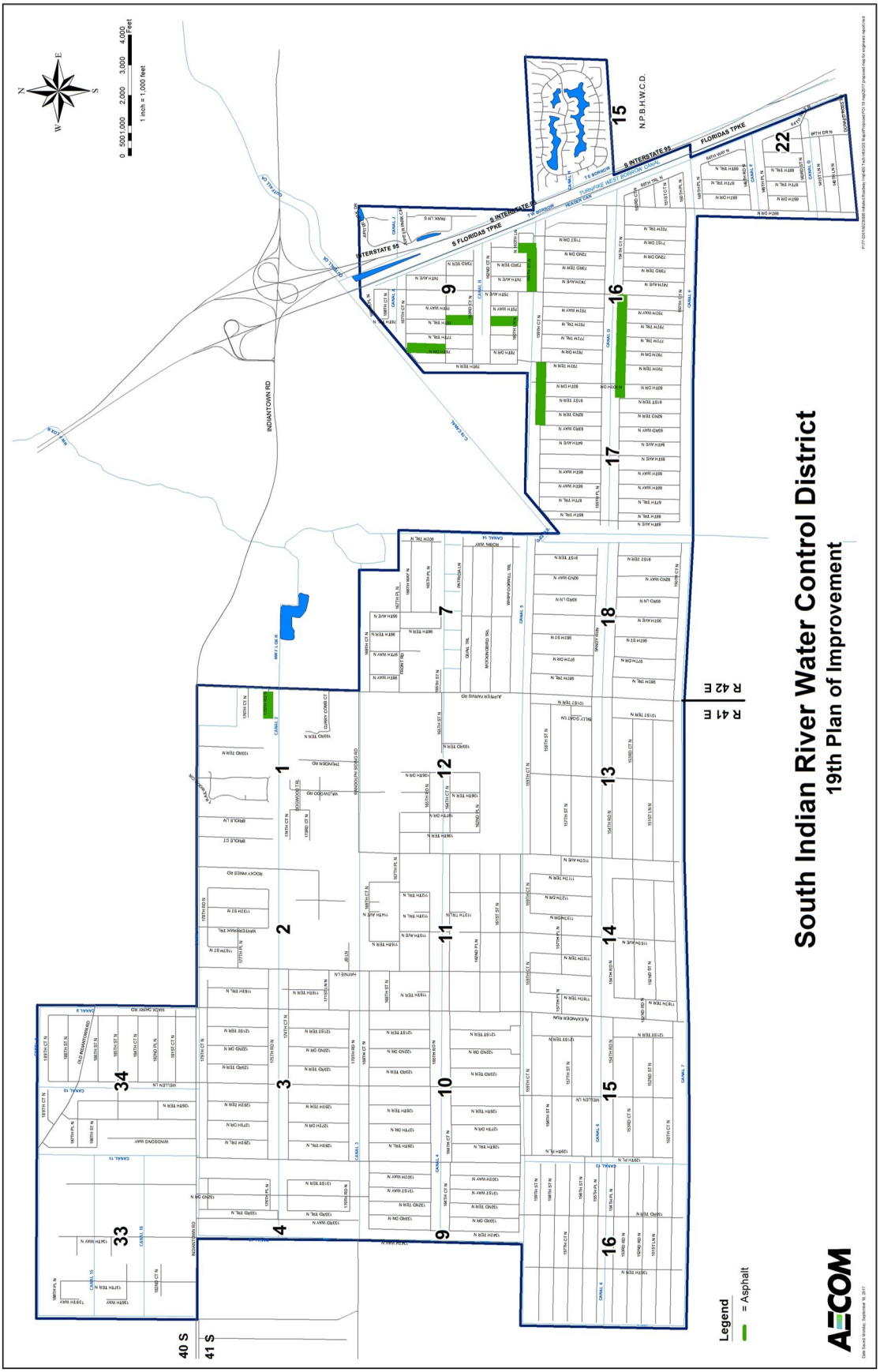

Figure 3. 19th Plan of Improvement

Proposed Landowner Initiated Roadway Project

Under the current Enhanced Stabilization Policy adopted on April 20, 2017, landowners are allowed to obtain petition forms from the District office for new requests starting on the first business day in February of each year and must return the petition by the last business day in April of the same year. Enhanced stabilization projects require a petition by landowners having signatures from more than 50% of the lots abutting the road segment or lots within the benefitted area, as determined by the District Engineer.

April 30, 2018 was the deadline for this year's acceptance of petitions, and the District received one petition for an enhanced stabilization project. The petition that was received and verified to meet the more than 50% requirement was for the roadway segment of 74th Avenue N. between 150th Court N. and 154th Court N. for an asphalt surface *(Figure 4)*. This segment is approximately 0.4 miles and has a preliminary cost estimate of $200,000.

The petition has been qualified, reviewed, and approved by the Board, District Manager of Operations, and District Engineer. A referendum ballot will be sent to all landowners on the road segment reflecting the estimated assessments. Under this policy a successful referendum requires an affirmative vote by at least 90% of benefited landowners for passage. The referendum will be sent out next fiscal year.

Figure 4. 74th Avenue N.

Proposed Capital Improvement Program

With the abundance of rainfall received this year, the concerns of pollutants entering the Loxahatchee River, and the concerns of reduced storage due to development, the Board has directed staff to re-evaluate the District's facilities to determine if capital improvements are needed to address these issues. The Board authorized staff to work on a conceptual plan to determine if the District should consider developing projects to provide additional storage and water quality treatment within the District. This plan will provide the District information on where these projects would benefit the most, develop cost estimates for projects, and provide the District a capital improvement plan that can be implemented over the next 5 to 10 years.

In conjunction with this plan, a section by section evaluation is being conducted to supplement operation and maintenance activities as well as determine if additional capital improvements are needed. This evaluation is more detailed than the conceptual plan and consists of obtaining detailed survey in order to design facilities to improve conveyance, add storage, and add water quality treatment. The District has started a pilot project on the evaluation of Section 7 (*Figure 5*) in Jupiter Farms. Survey data has been obtained and staff is beginning to determine where existing swales can be widened, proposed swales can be constructed, drainage easements can be cleared, and improvements to the outfall culverts can be made to help detain and treat water before discharging into the canals.

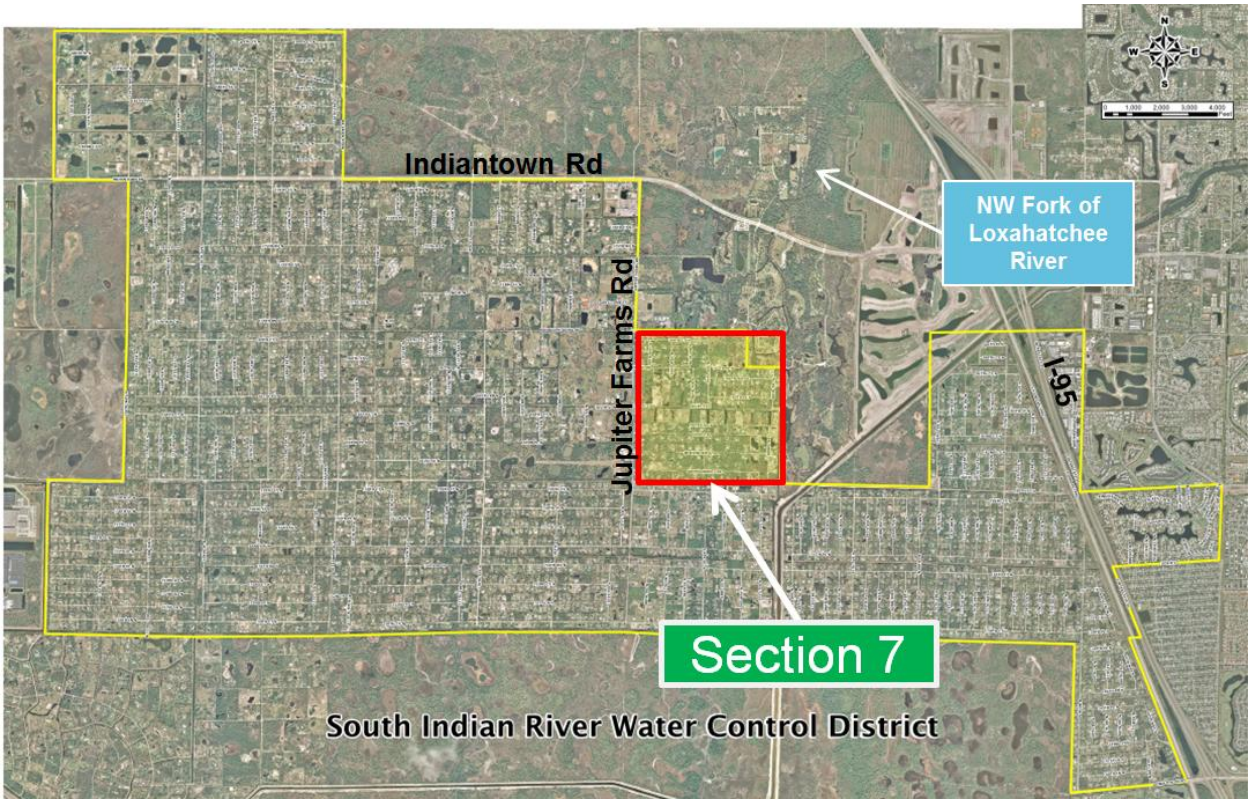

Figure 5. Section 7 Location Map

Resource Regulations

National Pollutant Discharge Elimination System (NPDES)

The current Palm Beach County Municipal NPDES Permit was issued by the Florida Department of Environmental Protection (FDEP) on September 8, 2016. SIRWCD is a co-permittee along with 34 municipalities, the Department of Transportation, Palm Beach County, and four special districts. In order to complete the permit-related activities that are performed collectively by the co-permittees, an NPDES Steering Committee was formed. The Steering Committee meets on a regular basis to evaluate the program, to provide training and resources to the co-permittees, and to assist with the preparation of the annual reports. Staff continues to attend the Committee Meetings as a Steering Committee Board member. This past year the meetings included discussions on the Loxahatchee River Reasonable Assurance Plan, the Pollutant Loading Assessment Program requirements, public education, the Annual Reports and Joint Report, and required refresher training videos on spill prevention, illicit discharges and sediment and erosion control. The Cycle 4/Year 1 Annual Reports were submitted to FDEP in February. In June, FDEP presented their comments on the previous year's Annual Report.

Waters of the United States (WOTUS) Proposed Rule

On April 21, 2014, the EPA and the Army Corps of Engineers proposed draft rules revising the definitions of Water of the United States or "WOTUS". The stated intent of the changes is to clarify what is and what is not a WOTUS. After many agency comments on the proposed rule, the rule was revised and the EPA and the Army Corps of Engineers published final rules revising the definitions of WOTUS that became effective on August 28, 2015. However if implemented as adopted, the new regulations will result in significant impacts on the NPDES program and municipal separate storm sewer system (MS4) permit holders because most ditches, stormwater conveyances, and certain flood control devices will be considered to be "WOTUS" and subject to permit conditions and numeric nutrient criteria.

On August 27, 2015, a federal judge in North Dakota granted a petition filed by 13 western states to enjoin implementation of the rules – making implementation and application of the rules throughout the rest of the country even less certain. In addition, other states including Florida filed lawsuits challenging the rule.

On October 9, 2015, the Sixth Judicial Circuit Court of Appeals issued a nationwide injunction stopping the WOTUS rule from being implemented. On March 6, 2017, the President of the United States issued an Executive Order directing EPA and Department of the Army to review and rescind or revise the proposed rule. To meet the objectives of the Executive Order, federal agencies are following a two-step process that will provide as much certainty as possible, as quickly as possible, to the regulated community and the public during the development of the replacement rule.

1. Step One – Repeal – The agencies are proposing to repeal the 2015 Rule and recodify the regulation that was in place prior to issuance of the 2015 Rule. This first step is to revise the Code of Federal Regulations to re-codify the definition of "Waters of the United States" which currently governs administration of the Clean Water Act, in light of a decision by the U.S. Court of Appeals for the Sixth Circuit staying a definition of "Waters of the United States" promulgated by the agencies in 2015. This action will simply make the text of the Code of Federal Regulations reflect the definition currently in effect under the Sixth Circuit stay. This action, when final, will not change current practice with respect to the how the definition applies, which is consistent with Supreme Court decisions, agency guidance documents, and longstanding practice.

   On June 29, 2018, the agencies signed a supplemental notice of proposed rulemaking to the proposed Step One Repeal. This notice clarifies that the agencies are proposing to permanently repeal the 2015 Rule in its entirety. As part of the initial proposal, the EPA and the Army indicated their intent to recodify the pre-2015 regulations—a longstanding regulatory framework—until the agencies finalize a new definition of WOTUS.

   The agencies are issuing the supplemental notice of proposed rulemaking to give the public an opportunity to comment on additional considerations that support the agencies' proposed repeal, some of which the agencies did not discuss in detail in the initial Step One proposal. The agencies are continuing to review the comments received on the July 2017 proposal. The public comment period closed on August 13, 2018.

2. Step Two – Revise – The agencies plan to proposed a new definition that would replace the approach in the 2015 Rule and the pre-2015 regulations, taking into consideration the principles that Justice Scalia outlined in the *Rapanos* plurality opinion. This second step is a public notice-and-comment rulemaking involving a substantive reevaluation and revision of the definition of "Waters of the U.S." in accordance with the executive order. On April 19, 2017, EPA initiated a formal process known as Federalism consultation, which requires agencies to conduct pre-proposal discussions with elected state and local officials and their associations where a rule may have implications for the distribution of power and responsibilities among federal, state, and local governments. On April 20, 2017, EPA, with the participation of Department of Army and the Army Corps of Engineers, initiated the consultation process with tribal leaders. Like the Federalism consultation, this process assures that the agencies consider tribal concerns and interests whenever EPA's actions and/or decisions may affect tribes, and it enables the agencies to coordinate with tribes and get their input before proposing a rule. The written comment periods for these consultation periods closed on November 28, 2017.

In addition to the two-step process above, on January 31, 2018, the Environmental Protection Agency and U.S. Department of the Army (the agencies) finalized a rule adding an applicability date to the 2015 Rule defining "waters of the United States." The 2015 Rule will not be applicable until February 6, 2020.

Given uncertainty about litigation in multiple district courts over the 2015 Rule, this action provides certainty and consistency to the regulated community and the public, and minimizes confusion as the agencies reconsider the definition of the "waters of the United States" that should be covered under the Clean Water Act.

The agencies' new rule is separate from the two-step process the agencies propose to take to reconsider the 2015 Rule.

The proposed rule published in the Federal Register on November 22, 2017. The public comment closed on December 13, 2017. Comments can be found in the docket. The final rule was signed on January 31, 2018, and was published in the Federal Register on February 6, 2018.

Due to active court cases on the rule, the United States is operating under two rules; the 2015 Clean Water Rule and the Pre-2015 Regulations and Guidance. Currently, Florida is operating under the Pre-2015 Regulations and Guidance. *Figure 6* shows which states are operating under the two rules.

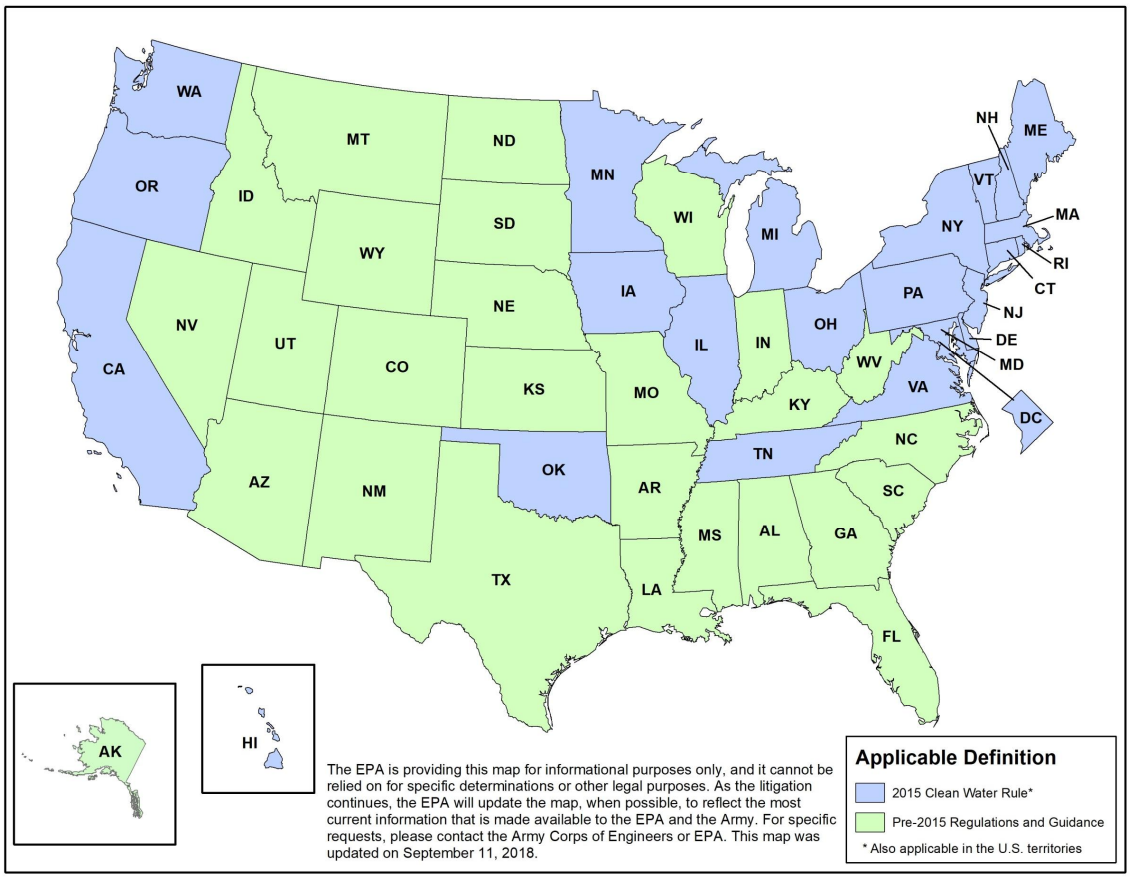

Figure 6. Applicable Definition

Public Facilities Report/Water Control Plan

Chapter 189 of the Florida Statutes, the Uniform Special District Accountability Act, requires the preparation and submission of a Public Facilities Report to governmental jurisdictions in which the District resides such as Palm Beach County, the Town of Jupiter, and South Florida Water Management District. Special Districts are required to submit an update to this report every five years and, at a minimum, the report must contain information as to the status of the District's public facilities and changes or revisions to those facilities that have occurred in the past year.

Since 1991, when the District filed its first Public Facilities Report, data collection has been an on-going process to provide for better and more accurate mapping of the works of the District. The Public Facilities Report is continually modified as each Plan of Improvement is added to the District's facilities. The current modification includes the Nineteenth Plan of Improvements. In accordance with Chapter 298.225 Florida Statutes, the Water Control Plan has been amended consistent with the preparation of the proposed Plan of Improvements during the last year.

With the re-evaluation of the District facilities, the conceptual plan may propose capital improvements to address water quantity and quality concerns. Should the proposed capital improvements be approved by the Board, the Public Facilities Report would be modified to illustrate these changes. The report would also include a capital improvement program as a result of the approved improvements.

Government Agencies

A summary of regulatory agencies and cooperative associations affecting SIRWCD is listed in the Annual Report each year. The following list is offered to inform the landowners of the number of regulatory agencies and cooperative associations with which the District conducts business and their potential impact on the District's capital improvements, operations, and maintenance.

- United States Environmental Protection Agency (EPA)
- United States Army Corps of Engineers (ACOE)
- United States Fish and Wildlife Service
- Florida Department of Environmental Protection (FDEP)
- Florida Department of Economic Opportunity (DEO)
- Florida Department of Transportation (FDOT)
- Florida Fish and Wildlife Conservation Commission
- South Florida Water Management District (SFWMD)
- Palm Beach County
- Loxahatchee River Environmental Control District (LRD)
- Town of Jupiter
- Loxahatchee River Preserve Initiative (LRPI)
- Northern Palm Beach County Improvement District (NPBCID)
- City of West Palm Beach
- Indian Trail Improvement District
- Jupiter Inlet District
- City of Palm Beach Gardens
- Martin County
- United States Geological Survey (USGS)
- Loxahatchee River Ecosystem Management Area Committee
- Loxahatchee River Management Coordinating Council (LRMCC)
- Solid Waste Authority of Palm Beach County (SWA)
- Numerous Citizen Interest Groups and Committees

Loxahatchee River Management Coordinating Council (LRMCC)

The LRMCC was established by Chapter 83-358, F.S. The Council is comprised of federal, state, and regional agencies and local representatives. It advises the FDEP and SFWMD on matters that affect administration of the Loxahatchee River, to identify and resolve inter-governmental coordination problems and to enhance communications. The Council is also responsible for the development of the Loxahatchee River Management Plan, which contains the principal goals to preserve and enhance the river's unique natural values, restore the river's historic hydrology and reverse the deleterious impacts of saltwater intrusion on the River's ecosystems.

Figure 7 shows a map of the Loxahatchee River.

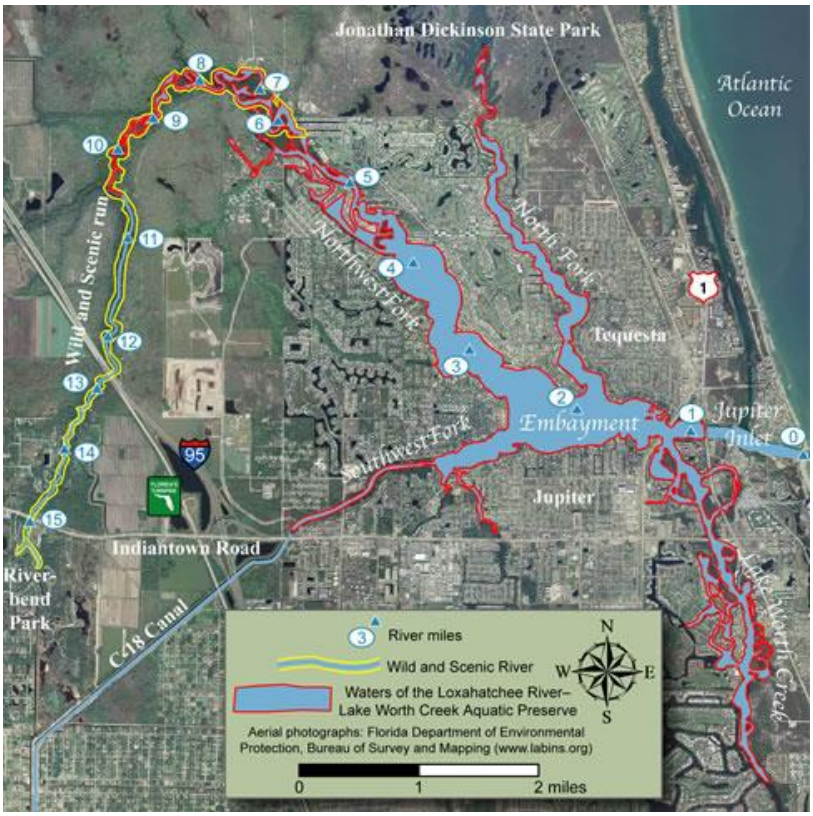

Figure 7. Loxahatchee River

They also continually assess the implementation of the plan's objectives. These objectives are:

- Preserve and enhance the river's unique natural and cultural values
- Restore the river's historical hydrologic regime and reverse deleterious saltwater intrusion

SIRWCD participates as a member of the Coordinating Council due to the fact that the Northwest Fork of the Loxahatchee River is the primary stormwater outfall for the entire portion of SIRWCD lying west of the SFWMD C-18 Canal, and the area east of the SFWMD C-18 discharges into the middle of the Loxahatchee River. SIRWCD and the LRMCC also have several mutual issues and interests.

Over the past year, the LRMCC has been actively monitoring projects that could affect the Loxahatchee River. These projects include the close out of the Lainhart and Masten Dam Refurbishment Project, the Loxahatchee River Watershed Restoration Project, the Project Development and Environment (PD&E) Study to Widen Florida's Turnpike from Indiantown Road to Okeechobee Road, the Riverbend Park project, and the development of a Reasonable Assurance Plan (RAP) for the Loxahatchee River. They also monitor activities that may affect the river such as supporting land acquisition activities by SFWMD.

Reasonable Assurance Plan (RAP)

On March 28, 2016, the FDEP approached the LRMCC on the proposed development of a Total Maximum Daily Load (TMDL) within some waterbody identification units (WBID) within the Loxahatchee River that have shown impairments in Chlorophyll a (nutrients) and Fecal Coliform as shown in *Figure 8*. FDEP suggested that instead of development of a TMDL through the state process, LRMCC could take the lead on developing a Reasonable Assurance Plan (RAP), which would replace the TMDL and subsequent Basin Action Management Plan. The RAP is a stakeholder driven plan that examines the impairments and prepares solutions to aid in restoring the Loxahatchee River from impairment. FDEP is developing a TMDL concurrently with the RAP process until the RAP process has been finalized by the stakeholders.

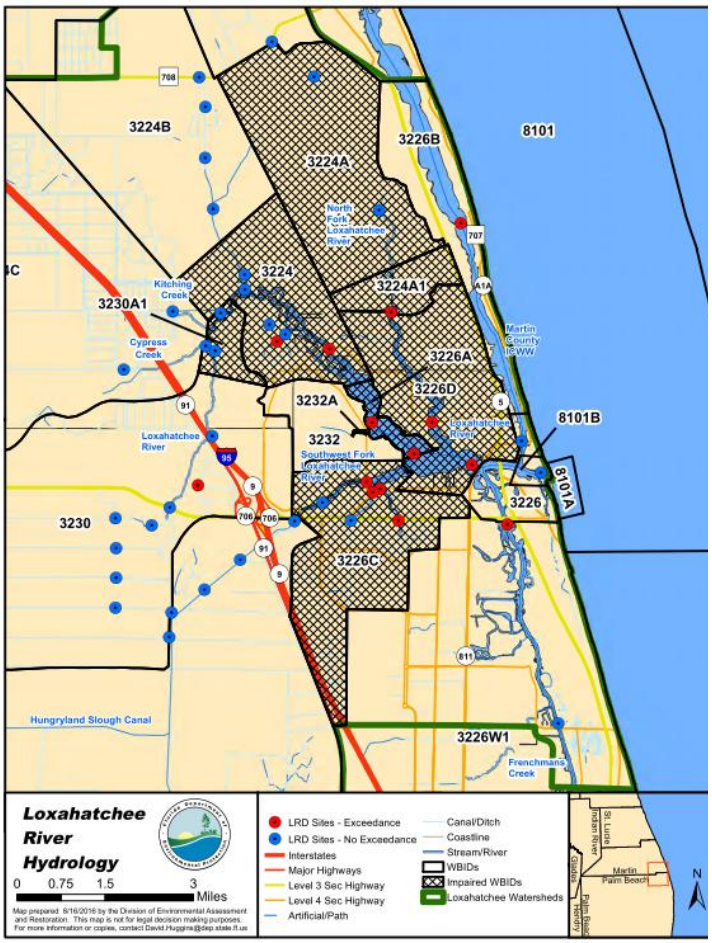

Figure 8. Impaired WBIDs

This year, stakeholders decided to move forward with the RAP. They also agreed on the methodology of the model for determining allocations and reductions. As part of the plan, stakeholders need to develop a water quality monitoring plan as well as submit projects to aid in reducing pollutants to restore the Loxahatchee River. FDEP is currently collecting projects from the stakeholders to determine if the current projects are sufficient for obtaining the necessary reductions. Staff continues to participate in the development of this plan.

Loxahatchee River Preservation Initiative

The Loxahatchee River Preservation Initiative (LRPI) is the outgrowth of a watershed management effort that the FDEP spearheaded in 1996. This multi-agency and stakeholder based advisory group was organized primarily for the purpose of soliciting, ranking and submitting to the Florida Legislature a list of projects focused on the preservation and restoration of the water quality and habitats of the Loxahatchee River (*Figure 9)* and its watershed. Agencies and stakeholders are given an avenue to apply for funding on several key projects that are critical to preserving the long-term health of the Loxahatchee and have not been implemented due

Figure 9. Loxahatchee River

to lack of resources and other regional priorities taking precedence.

SIRWCD participates as a member of the LRPI due to its location within the Loxahatchee River watershed. This year, SIRWCD applied for grant funding for Section 7 Drainage Improvements. This project is the first of the section by section analysis. A presentation for the approval of this project was held on August 28, 2018 for the fiscal year 2020 funding. SIRWCD presented swale improvements, drainage easement clearing, and updated outfall structures to help reduce water quantity and to provide water quality treatment. SIRWCD will continue to apply for grants in the future.

South Florida Water Management District (SFWMD) Everglades Restoration Strategies

The State of Florida and the EPA reached a consensus on new strategies for improving water quality in America's Everglades. The SFWMD's Everglades Restoration Strategies Regional Water Quality Plan has been developed in order to address water quality–based effluent limits for Stormwater Treatment Areas to meet NPDES permitting requirements by EPA. Under these strategies, the SFWMD is implementing a technical plan to complete several projects that will create more than 6,500 acres of new stormwater treatment areas (STAs) and 116,000 acre-feet of additional water storage through construction of flow equalization basins (FEBs). FEBs provide a more steady flow of water to the STAs, helping to maintain desired water levels needed to achieve optimal water quality treatment performance.

Construction of the treatment, storage and conveyance improvement projects in the Restoration Strategies Regional Water Quality Plan will be complete by 2025. Several projects are already operational, and many others are underway. These projects are shown in *Figure 10* and are described as follows:

- A-1 Flow Equalization Basin – With a capacity of 60,000 acre-feet, this project is the largest of three flow equalization basins in the plan. This project was completed in July 2015 and is operational.
- S-5AS Structure Modifications – Implementation of the projects within the plan will increase the use of this existing structure due to direct stormwater runoff north to the L-8 FEB for storage. As a result, some modifications and upgrades to the structure were required. This project was completed in May 2016 and is operational.
- L-8 Divide Structure (G-541) – G-541 is a fully automated water control structure located within the L-8 canal, just east of the L-8 FEB. This project was completed in July 2016 and is operational.
- S-375 Structure Expansion (G-716) – The new G-716 structure expands the capacity of the existing S-375 structure, located within STA-1 East. This structure was completed in April 2017 and is operational.
- L-8 Flow Equalization Basin – Building on a strategically located 950-acre former rock mine, this deep below-ground reservoir is capable of storing 45,000 acre-feet of water. Initially, this project will function as a multipurpose FEB to capture, store and deliver water to STA-1 East and STA-1 West to improve performance and restoration. When the STA-1 West expansion is operational, the L-8 FEB will transition to primarily storing stormwater runoff and delivering flows to optimize the treatment performance of STA-1 East and STA-1 West. The project was completed in July 2017 and is operational.

- STA-1 West Expansion – Located immediately northwest of the Arthur R. Marshall Loxahatchee national Wildlife Refuge, STA- West removed excess phosphorus and other nutrients from stormwater flowing into the Refuge and other parts of the greater Everglades. The 6,500-acre expansion of STA-1 West, which will take place in two phases, will double its effective treatment area and further reduce phosphorus concentrations. The STA-1 West Phase 1 Expansion construction is ongoing and is expected to be complete by December 2018. Phase 2 consists of land acquisition, which was completed in January 2018. Design is scheduled to start by October 2018 with construction completion in December 2022.
- G-341 Related Conveyance Improvements – This project is a multi-phase, multi-year project intended to improve conveyance within the eastern Everglades Agricultural Area, specifically in the Bolles East, Ocean and Hillsboro canals. Improvements to Bolles East Canal Segments 1 and 2 are complete. Segment 3 construction and Segment 4 design are ongoing. Construction completion is anticipated in December 2024.

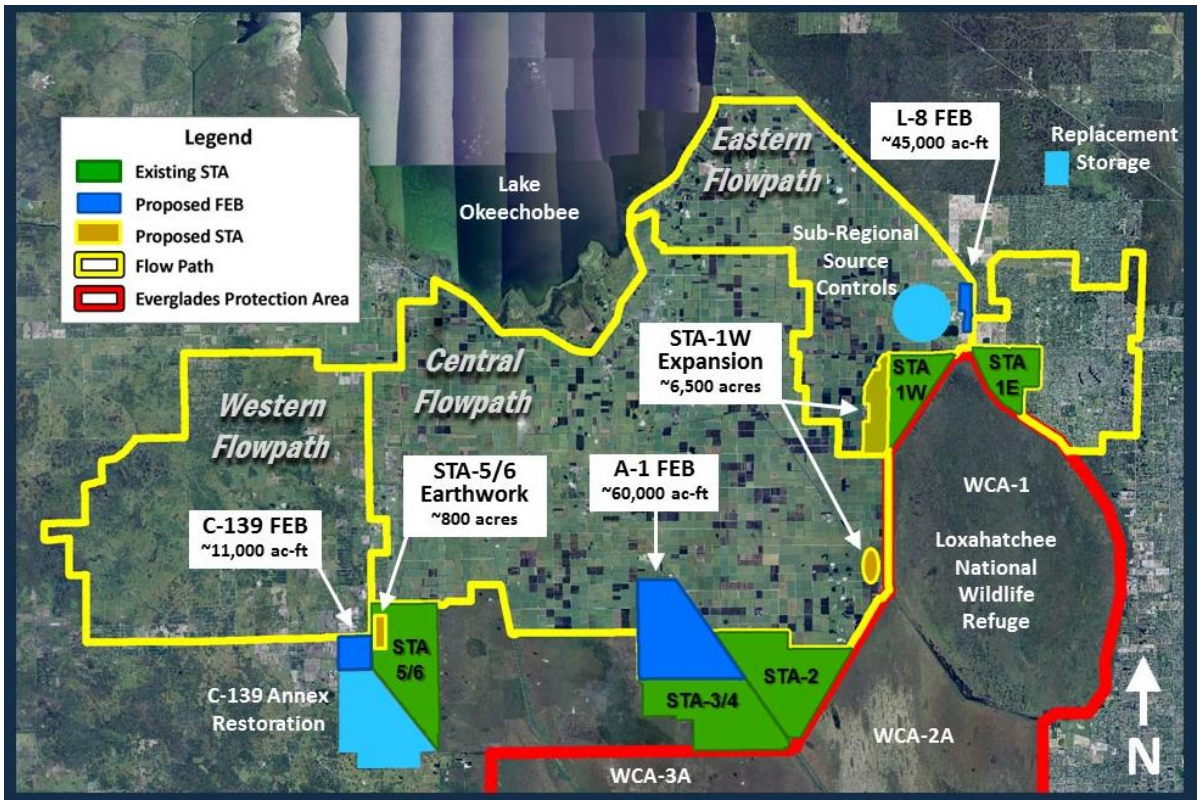

Figure 10. Final State Proposal of Key Projects and Components

Loxahatchee River Watershed Restoration Project (LRWRP)

In December 2014, SFWMD and the Army Corp of Engineers (ACOE) kicked off the Loxahatchee River Watershed Restoration Project (formerly known as North Palm Beach County – Part 1), which is part of the Comprehensive Everglades Restoration Plan (CERP). The renewed purpose of the project is to restore and sustain the overall quantity, quality, timing, and distribution of freshwaters to the federally designated "National Wild and Scenic" Northwest Fork of the Loxahatchee River for current

and future generations. This project also seeks to restore, sustain, and reconnect the area's wetlands and watersheds that form the historic headwaters for the river and its tributaries. *Figure 11* indicates the study area.

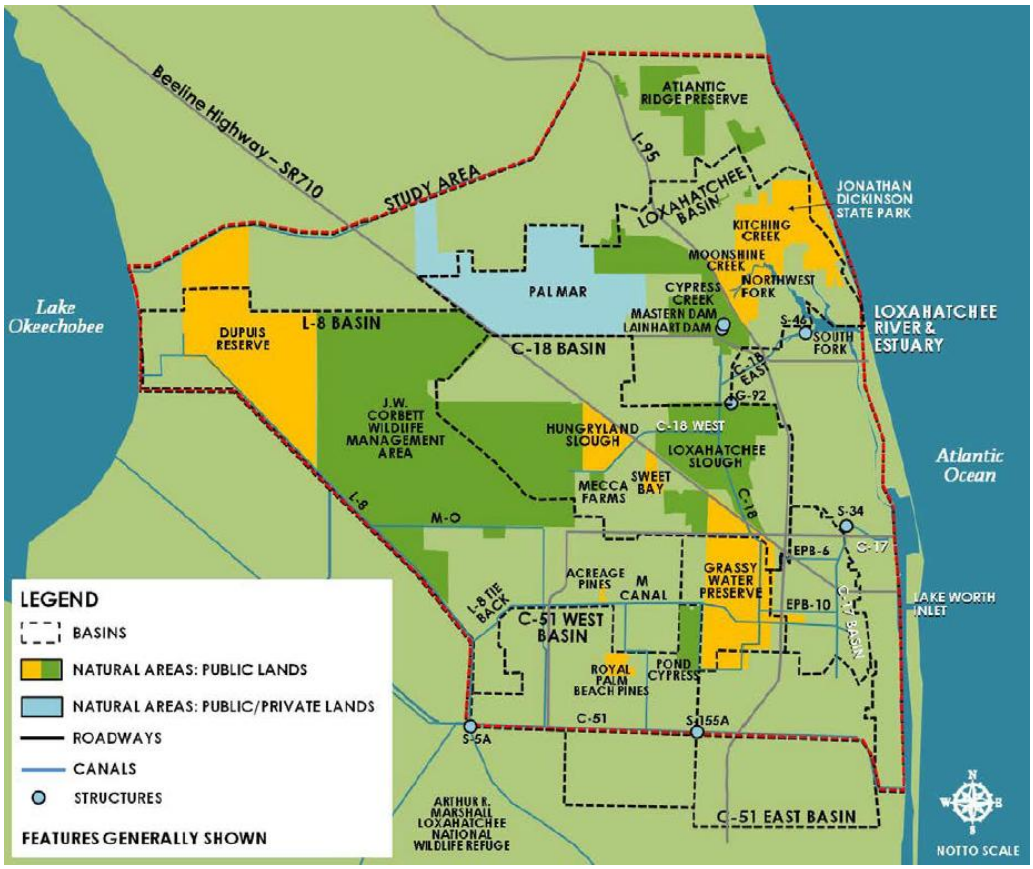

Figure 11. LRWRP Study Area

Planning efforts for the project were put on hold in 2011 and were restarted on January 12, 2015. The project was re-scoped under ACOE's New Planning Paradigm and existing plan formulation data and analysis is being used in the development of a final plan, known as a Project Implementation Report (PIR) and Environmental Impact Statement, to prepare for congressional authorization.

Over the past year, the SFWMD and the ACOE have been conducting the alternative formulation and analysis process of the plan formation. This consisted of evaluating alternative plan selections for determining the best project scenarios. A calibration report was produced to illustrate the existing watershed conditions at the same time that alternative project analyses are being conducted. As a result of these evaluations and updated modeling, Alternative 5R was selected for the tentatively selected plan (TSP). This plan consists of 10 components and is shown in *Figure 12.* On August 1, 2018, the PDT was notified that the ACOE Headquarters concurred with the PDT's recommendation for Alternative 5R. ACOE is now moving forward with completing the draft Project Implementation Report (PIR) and Environmental Impact Statement. Releasing the draft report for review by agencies and the public is contingent on approval for additional funds and time. The current scheduled date to release the draft report is October 26, 2018. SIRWCD has been attending these meetings along with participating in the engineering and modeling sub-team to ensure that SIRWCD's operations are being represented correctly within the modeling effort.

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ALTERNATIVE 5R

1. **Kitching Creek (Hydration):** Spreader canal; weir/plug (Jenkins Ditch)
2. **Moonshine Creek (MC) & Gulfstream East (GE) (Restoration):** Connect HSLCD ditch to MC; clear MC vegetation; weir in Hobe Grove Ditch; regrade adjacent area to historic topography
3. **Cypress Creek Canal (CCC) (Reduce Over-drainage):** Replace CCC weir to raise control elevation; raise berm at Ranch Colony; automate twin 84" culverts; pump and spreader swale; regrade CC southern forks;
4. **Gulfstream West (Restoration & Reduce Over-drainage):** Partial backfill & relocate southern end of HSLCD canal; small pump; construct flow through marsh to attenuate flow
5. **Palmar East (Restoration & Connectivity)** Plug ditches; remove pipes; improve northern berm; construct western berm; improve eastern berm; pumps at Thomas Farm; redirect drainage to GW flow-through marsh via north Nine Gems canal
6. **C-18W Reservoir (9,500 ac/ft & 4 ASR Wells):** Above-ground reservoir; inflow pump; discharge structure; seepage control; M-O Canal Connector and pump
7. **G-160 Structure (Reduce Over-drainage):** Improve hydroperiod in Loxahatchee Slough
8. **G-161 Structure (Connectivity):** GWP water to Loxahatchee Slough
9. **GWP Triangle (Connectivity)**
10. **M-1 Pump Station (Conveyance):** Deliver Lower M-1 Basin water to M-Canal, GWP, and G-161

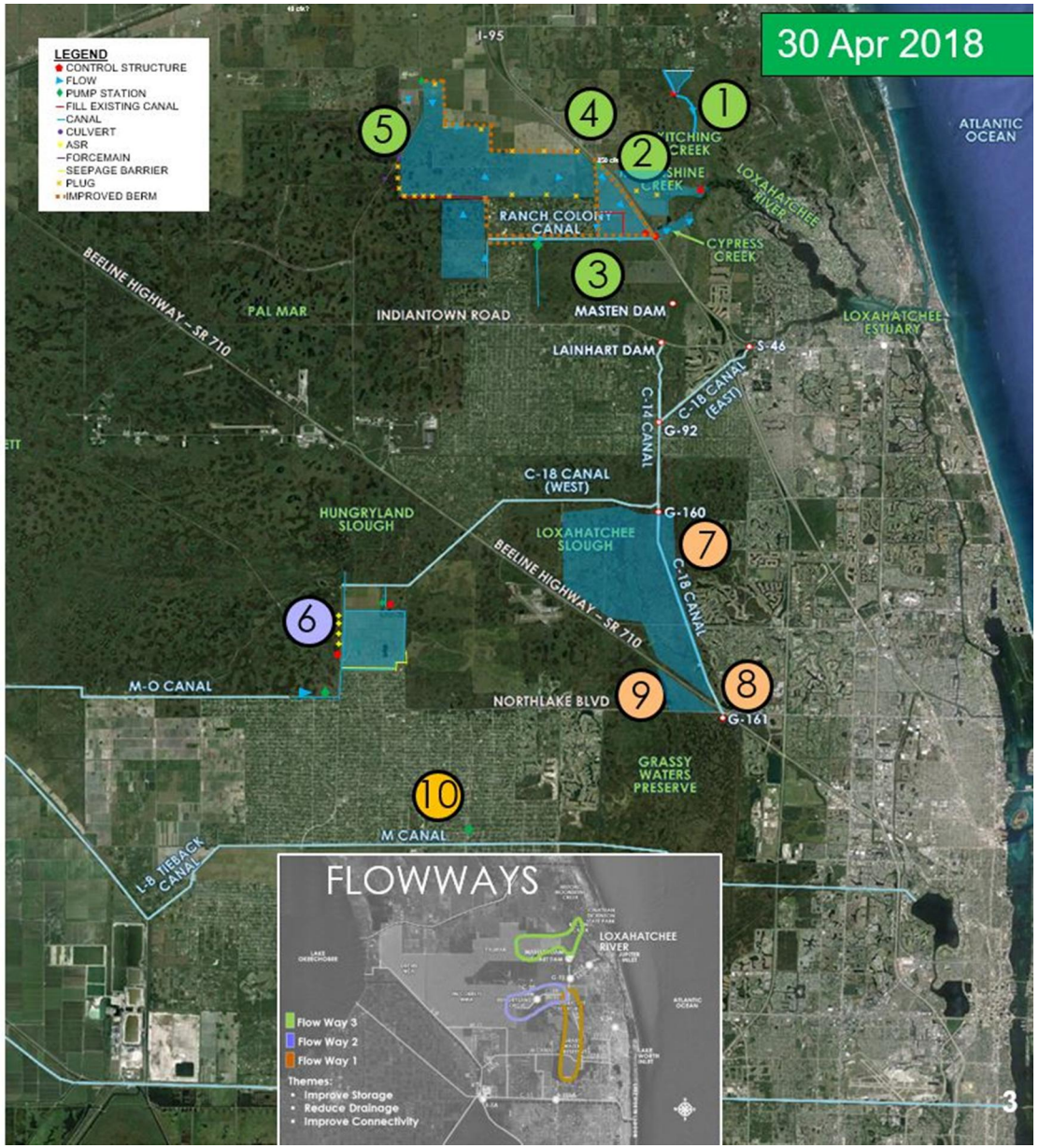

Figure 12. Alternative 5R

Florida Association of Special Districts

SIRWCD's Board of Supervisors and staff are active participants in the Florida Association of Special Districts (FASD). FASD is the recognized, collective voice of special purpose government across the State of Florida. This diverse network of both Independent and Dependent Special Districts have come together to provide resources uniquely developed to meet the needs of Florida's Special Districts. The purpose of the FASD is to keep the public informed of the benefits of Special Districts, update members with information useful to themselves and their community, review all government activities as they affect the interest of Special Districts, and to forward requests and comments to the Florida Legislature. FASD provides primary education and training to satisfy the educational requirements of Ch. 189, Florida Statutes. The purpose of the education program is to ensure that elected boards and district managers comply with Florida Statutes governing special districts. The Department of Economic Opportunity, Division of Community Development, assists with educational programs for board members and the annual conference by partnering with FASD.

The FASD holds regular meetings throughout the year where information from other water control districts, improvement districts, community development districts, and special taxing districts can be shared with regard to policies, procedures, operation, and maintenance issues. In addition, members of FASD are "watchdogs" for codes, ordinances, rules, and/or legislation that can either help or hinder the activities of Special Districts. To this end, a significant effort is put forward during the annual legislative session. FASD members continue to benefit from each other's experiences.

The FASD will continue to follow this order and represent the interests of its members and provide information on pertinent legal requirements, sunshine laws, economic challenges, environmental, emergency management, and homeland security issues.

Operation and Maintenance

Debris Removal

On September 10, 2017, Hurricane Irma made landfall just before last year's annual landowner's meeting. As a result of this storm event, the District has been working with the Federal Emergency Management Agency (FEMA) and the National Resource Conservation Service (NRCS) on debris removal within the canal system. For reimbursement from FEMA, the District identified approximately 27 sites along the perimeter canal system and 2 sites in Section 33. FEMA would only reimburse for the actual tree removal along the banks and within the canals. The NRCS reimburses for slope repair. The slope repair project includes 17 sites for minor repair and 1 site for rip rap stabilization. This contract is anticipated to begin September 2018.

Figure 13. Needed Slope Repair

Culvert Replacement Program

Figure 14. Canal Culvert under 175th

Culverts under driveways have been aging over the years. These culverts are the landowner's responsibility to maintain and to replace when their life span has ended. These culverts, when not maintained, collapse and block the secondary drainage system of the District. The District has instituted a culvert replacement program which allows the landowner's to pay the District for the replacement of their culverts. *Figure 13* shows a typical driveway culvert installation. To date, the District had installed 400 driveway culverts in Jupiter Farms and Palm Beach Country Estates.

In addition to driveway culverts, the District inspects the outfall culverts to the canals, cross drain culverts under roadways, and other culverts that the District operates and maintains. The District assesses the condition of these culverts and replaces them as needed. The District identified the two 60-inch diameter culverts under 175th Drive N. to replace this upcoming year. These culverts are being replaced due to their condition and due to the timing of the asphalt improvement of 175th Drive N. These culverts are being replaced with a 9 feet by 5 feet box culvert to aid in the reduction of debris blocking the openings during storms.

Canal Clearing and Maintenance

Figure 15. Excavator

The District's canal network consists of over 60 miles of canals which are continuously in need of being maintained, restored, and enhanced. The canal clearing and maintenance program's objective is to keep the canal sections easily accessible and, to the best extent possible, free from trees and other vegetation that may potentially enter the canal during a major storm event and thereby create a restriction that would aggravate flooding.

The canal clearing and maintenance program provides services that include clearing, grading and shaping of the canals as well as restoring, replacing or enhancing structural improvements. The program is an ongoing effort and the District has continued to work to maintain and achieve the desired goals.

The Board has authorized an on-going swale maintenance program which allows the District Engineer and General Manager to identify areas within SIRWCD that could be improved for conveyance and storage. District staff will continue to work toward the desired goals of the District in the swale maintenance program. *Figure 14* shows equipment that is used to clean swales.

Secondary Ditch Reclamation

Over the years, landowners have been filling in their swales and ditches that are used for our secondary drainage system or they do not realize that they have an outfall swale on their property. The District has been examining the outfall swales throughout the District to determine the need for vegetation removal and/or outfall pipe replacements. The District has also been conducting title searches to determine whether the outfall swales are under a drainage easement so the maintenance can be conducted. Several outfalls have been reclaimed this year. The District plans on continuing this service. *Figure 15* shows an example of a ditch that needs to be reclaimed on Mockingbird Lane, which will be part of the Section 7 Drainage Improvement Project.

Figure 16. Mockingbird Outfall Ditch

Policies and Procedures Manual

In accordance with the provisions of the Florida Statutes, the District maintains a Policies and Procedures Manual that is available to the public. The Manual presents and discusses items including: District organization, agenda formulation and execution, processing of permits that affect works of the District, the budget process, etc. Periodic revisions including deletions, additions, and amendments are made to maintain consistency with Florida Statutes and other codes and rules. The entire manual is being updated to include new policies that have been added throughout the year. The update will continue through next year and includes the new Enhanced Stabilization Policy that was approved in April 2017.

Roadways

There are approximately 189 miles of roads within SIRWCD. These roads give access to each subdivided parcel of land. Currently there are 93.7 miles of improved roads (paved and OGEM) and 94.3 miles of unpaved roads in SIRWCD. The improved roads include roads that are operated and maintained by Palm Beach County, the Town of Jupiter, and private entities or owners, which consist of approximately 42 miles of roadway.

Aquatic Weed Control Program

SIRWCD implements an Aquatic Weed Control Program in order to maintain the primary canals throughout the District. This Program is an ongoing process aimed at reducing and managing the amount of weeds in the canal network to allow unobstructed drainage following rain events. The Aquatic Weed Control Program is necessary to prevent canals from becoming overgrown and to provide a clean channel through the canal system to the outfall.

The program controls emergent vegetation growth through the use of herbicides approved in permits obtained from the State of Florida as well as mechanical removal of dead or accumulated vegetation that may present a potential for impeding the flow of storm water through the primary canal system.

In the future, greater emphasis may be needed for this program as a result of NPDES water quality programs, the FDEP and EPA proposed storm water criteria, the Loxahatchee River Management Plan, and other intergovernmental coordinating activities.

Water Quality Monitoring

Due to the many ecological and regulatory pressures being exerted over the Loxahatchee River Basin area, it was recommended that the District sample and monitor water quality within and adjacent to its boundaries. The Loxahatchee River Environmental Control District (LRD) has been obtaining water quality samples in recent years. The existing locations sampled by LRD are depicted on *Figure 17*. LRD posts the results of these locations on their website.

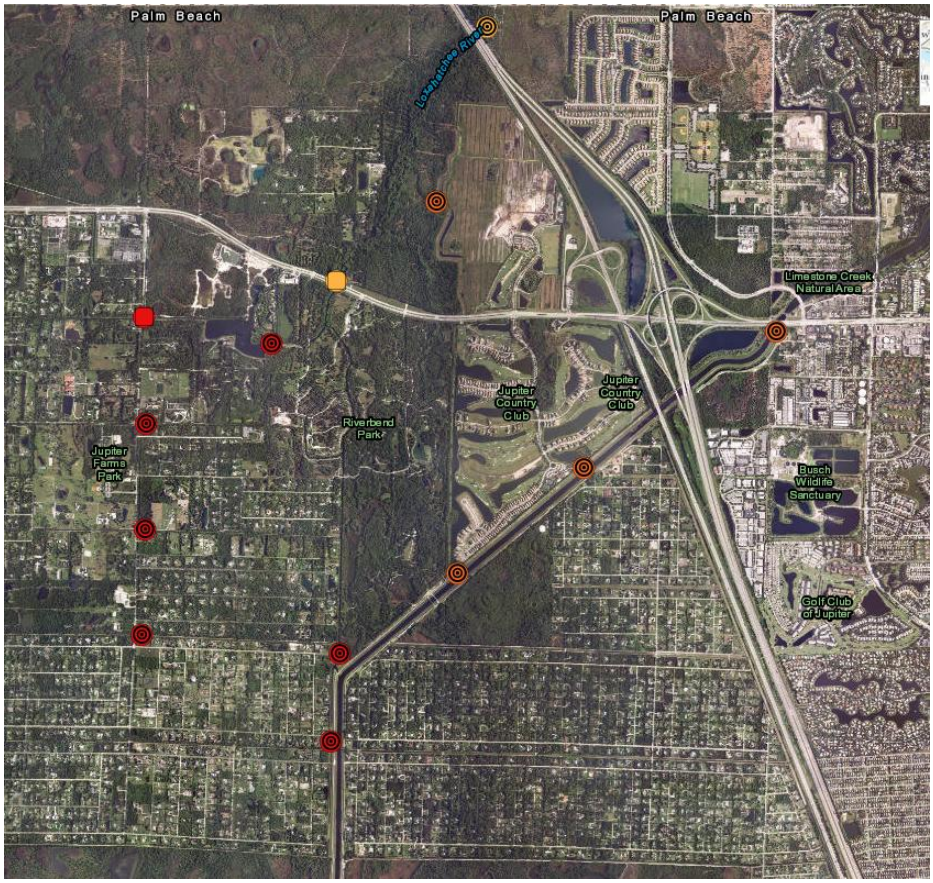

Figure 17. LRD Sampling Locations

Due to the water quality legislation, the Board of Supervisors instructed staff to implement a water quality monitoring program that augments and expands the current LRD program. In July 2011, SIRWCD entered into a contract with a water sampling and testing firm. The samples are tested to analyze the surface water and groundwater for various metal, organic and inorganic contaminants as well as water quality criteria. *Figure 18* illustrates the sampling locations for this program. Staff monitors these locations on a monthly basis. Samples are only taken when the District discharges outside its boundaries. This information is being used to monitor the District's discharge and will be used in future analysis as needed for the NPDES permit and the RAP.

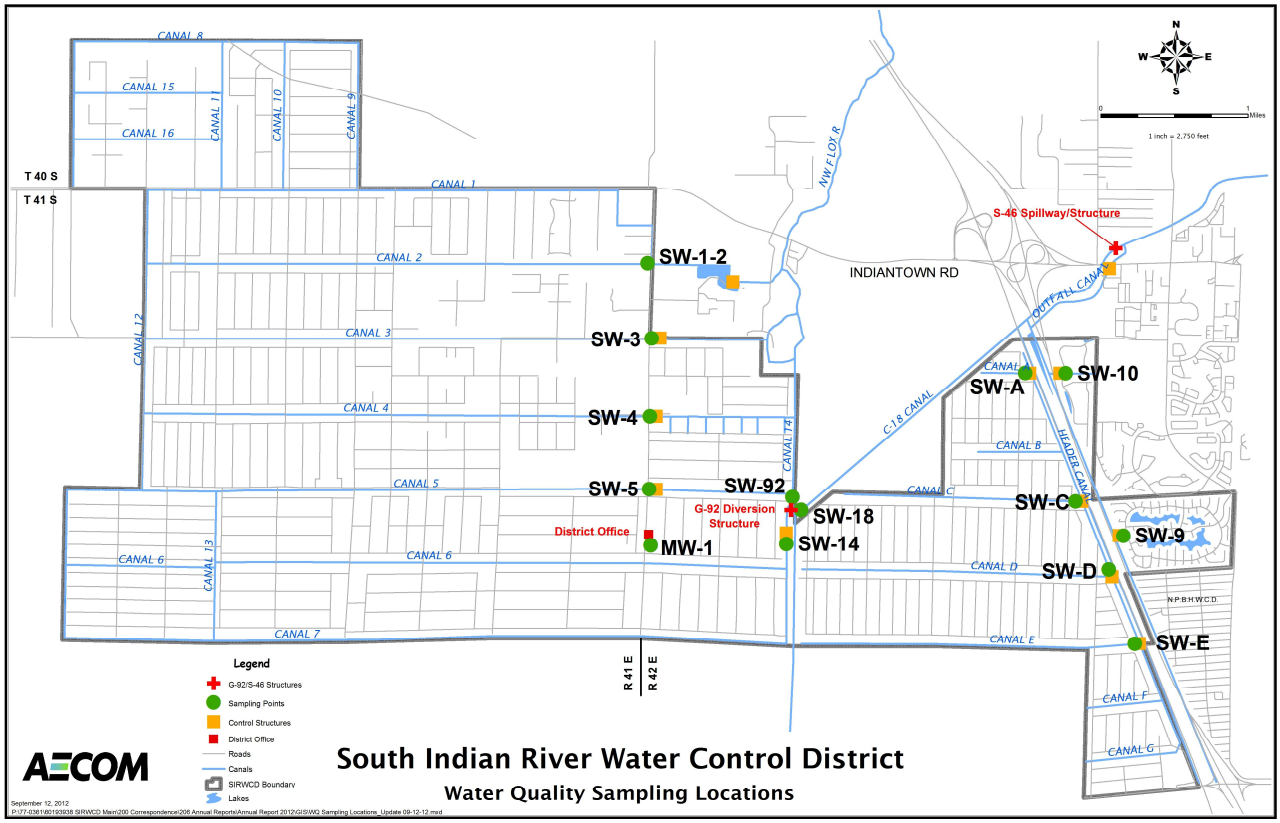

Figure 18. SIRWCD Sampling Locations

Rainfall

The SIRWCD work center monitors and records the total rainfall the District receives throughout the year. For the twelve month period from September 2017 through August 2018, the District received 105.13 inches of rainfall. The District's historical monthly rainfall data dating back to 1987 as well as the calculated monthly average rainfall is illustrated in *Table 1*. The average annual rainfall for SIRWCD is 66.15 inches with this year's data. The 2017-2018 year rainfall was approximately 39 inches higher than the historical rainfall average within the District. Historical rainfall data obtained by LRD, the Town of Jupiter Water Department (TOJ), and the SFWMD are shown below in *Tables 2*, *3*, and *4,* respectively.

The 2017-2018 monthly rainfall data from SIRWCD, LRD, and TOJ have been averaged to determine the rainfall for an area referred to as North County. The average total year rainfall in North County from September 2017 to August 2018 was 86.92 inches. The North County Averages can be found in *Table 5*.

The SFWMD data represents the historical averages of numerous rainfall measuring stations throughout Palm Beach County. *Table 6* and *Figure 19* compare the rainfall data from 2017-2018 SIRWCD, the 30 year SFWMD average, and the 2017-2018 North County average. The cumulative rainfall for 2017-2018 SIRWCD, the 30 year SFWMD average, and the North County average are shown in *Table 7* and *Figure 20*.

Table 1: SIRWCD Rainfall Data

Historical Rainfall Data (inches)													
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
1987-1988	8.08	6.03	12.92	1.25	4.00	2.60	3.20	2.50	9.30	13.25	14.20	10.75	88.08
1988-1989	1.00	1.35	1.70	1.75	0.40	0.25	4.10	5.50	1.90	6.95	7.90	6.75	39.55
1989-1990	3.80	3.75	1.40	2.15	1.10	1.80	6.20	2.20	4.85	5.85	4.85	9.40	47.35
1990-1991	11.35	3.05	2.65	2.55	7.75	4.20	4.25	7.35	5.50	15.90	9.80	5.72	80.07
1991-1992	9.95	4.35	4.85	0.55	0.75	6.25	4.70	3.00	2.45	16.85	2.80	11.95	68.45
1992-1993	9.00	0.75	9.85	0.75	12.60	4.15	10.75	2.10	7.18	7.30	4.75	3.73	72.91
1993-1994	8.15	12.00	2.57	0.47	2.09	4.12	1.67	2.50	2.65	7.23	4.91	9.77	58.13
1994-1995	7.55	7.15	7.87	7.51	2.32	1.83	2.68	3.57	1.43	10.08	10.73	14.80	77.52
1995-1996	4.78	25.90	0.71	1.22	1.39	1.00	11.94	2.01	10.62	7.39	9.74	8.31	85.01
1996-1997	7.41	6.60	4.37	0.98	4.11	6.41	2.51	7.24	5.45	14.60	6.18	12.39	78.25
1997-1998	10.26	1.78	3.53	5.45	6.54	7.84	4.78	5.71	1.91	1.88	8.74	7.13	65.55
1998-1999	10.81	4.03	10.86	1.26	9.76	0.68	0.37	0.87	2.59	16.38	7.21	15.22	80.04
1999-2000	9.79	17.41	0.76	5.39	1.23	1.55	3.27	4.16	0.89	3.21	7.33	2.49	57.48
2000-2001	6.45	12.06	1.03	3.15	1.10	0.03	5.56	0.65	5.92	9.78	8.28	11.81	65.82
2001-2002	14.26	6.65	3.17	2.73	1.25	6.41	1.29	5.31	2.03	10.56	9.71	5.63	69.00
2002-2003	3.67	2.40	3.13	2.95	0.17	1.61	7.62	6.22	10.70	5.81	2.62	9.41	56.31
2003-2004	4.65	6.45	5.81	3.38	2.09	2.07	0.81	2.11	3.11	3.95	8.66	7.70	50.79
2004-2005	25.72	1.44	1.39	1.04	1.50	1.44	9.44	2.05	6.80	12.69	4.07	7.00	74.58
2005-2006	13.21	11.80	3.08	0.74	0.43	2.97	0.67	2.67	2.39	8.59	6.06	12.04	64.65
2006-2007	4.56	2.22	1.58	3.58	0.28	1.40	0.74	3.37	5.09	10.72	12.93	9.44	55.91
2007-2008	12.38	7.55	1.92	4.43	0.95	4.07	4.15	2.32	4.78	8.14	5.40	9.07	65.16
2008-2009	4.98	4.62	1.47	2.08	0.05	0.74	4.89	1.39	11.15	6.30	8.87	6.68	53.22
2009-2010	3.82	1.92	2.92	7.32	1.86	2.15	9.46	4.98	6.50	7.06	5.71	9.99	63.69
2010-2011	9.20	1.20	1.59	0.44	3.21	0.39	2.33	1.02	3.91	7.10	7.63	7.70	45.72
2011-2012	9.72	11.30	1.59	2.00	0.75	6.62	4.50	1.18	6.93	5.97	4.30	15.66	70.52
2012-2013	3.87	4.59	0.51	3.66	1.22	2.40	1.18	3.60	8.72	9.65	10.74	9.35	59.49
2013-2014	9.40	0.81	6.98	1.49	11.65	2.84	4.43	1.62	6.14	11.80	9.37	5.90	72.43
2014-2015	7.23	4.25	1.58	1.27	1.41	10.97	3.06	4.36	2.67	4.63	7.26	8.69	57.38
2015-2016	9.50	0.98	3.62	10.04	7.91	3.51	6.40	1.67	5.65	6.47	2.21	10.42	68.38
2016-2017	4.25	4.71	0.21	2.48	2.25	3.19	1.32	6.64	4.22	11.26	11.04	2.48	54.05
2017-2018	12.42	18.46	7.20	1.23	3.81	0.49	0.52	5.74	17.71	17.00	11.45	9.10	105.13
AVG	8.43	6.37	3.64	2.75	3.09	3.10	4.15	3.41	5.52	9.17	7.60	8.92	66.15

Table 2: Loxahatchee River District (LRD) Rainfall

Historical Rainfall Data (inches)													
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
1974-1975	5.01	6.07	1.81	1.66	0.46	2.80	1.63	1.92	8.20	10.19	6.78	1.46	47.99
1975-1976	5.67	3.83	1.10	2.15	0.90	6.30	0.36	1.89	10.57	4.70	1.59	5.20	44.26
1976-1977	8.91	4.12	3.69	2.71	4.48	1.54	1.77	2.00	8.60	3.06	2.33	5.97	49.18
1977-1978	13.39	1.13	1.14	6.21	4.80	2.60	3.40	0.25	4.15	11.95	13.15	10.71	72.88
1978-1979	9.45	3.40	7.30	13.62	5.10	0.47	1.16	3.81	5.45	4.32	3.36	5.61	63.05
1979-1980	18.96	5.22	4.16	1.49	3.84	2.58	1.79	2.88	5.40	4.83	7.94	4.22	63.31
1980-1981	6.42	6.16	4.72	3.04	0.63	3.65	1.00	0.92	3.35	4.67	3.59	16.71	54.86
1981-1982	8.61	2.73	3.87	0.58	1.88	9.38	18.16	7.71	11.38	12.65	3.85	8.79	89.59
1982-1983	8.02	2.83	21.95	2.11	6.19	7.13	5.26	4.05	3.14	9.02	4.04	8.19	81.93
1983-1984	16.40	6.98	4.86	7.59	1.12	2.77	5.22	3.05	7.92	5.01	6.57	3.61	71.10
1984-1985	11.55	2.19	9.52	1.35	1.13	0.29	1.88	3.73	2.53	4.98	5.06	4.37	48.58
1985-1986	11.74	6.51	1.21	4.31	5.51	1.81	14.00	0.25	1.17	11.40	7.30	5.93	71.14
1986-1987	5.39	6.75	6.13	6.97	2.62	3.11	6.88	0.30	6.93	7.64	4.09	3.88	60.69
1987-1988	7.09	3.94	12.25	0.19	4.18	4.91	3.39	1.84	8.24	7.09	7.95	7.41	68.48
1988-1989	2.02	2.79	6.32	1.32	1.22	0.37	3.84	4.73	2.82	3.33	6.75	5.70	41.21
1989-1990	2.36	3.16	1.41	2.18	1.68	1.38	6.36	1.49	3.84	2.51	4.29	3.16	33.82
1990-1991	8.25	3.02	0.97	1.83	7.45	2.75	2.99	2.92	6.71	7.68	5.57	3.80	53.94
1991-1992	5.88	4.28	2.72	0.47	1.74	3.30	3.74	3.67	1.46	15.44	2.16	9.27	54.13
1992-1993	10.54	1.63	9.17	1.02	12.75	4.57	9.73	2.22	3.32	8.50	2.99	2.22	68.66
1993-1994	8.59	11.29	5.66	0.81	3.38	4.20	1.97	3.74	3.41	8.31	4.87	10.06	66.29
1994-1995	7.48	5.60	10.27	7.30	2.54	1.49	2.81	3.40	0.80	9.56	8.98	13.02	73.25
1995-1996	5.44	23.64	1.42	1.89	1.33	1.30	11.00	1.51	8.57	6.63	5.96	6.77	75.46
1996-1997	4.81	5.04	4.77	7.77	3.53	2.44	2.50	9.19	6.08	19.35	8.42	18.52	92.42
1997-1998	9.37	2.24	2.92	4.76	6.84	6.51	4.93	3.18	2.46	3.93	8.41	7.78	63.33
1998-1999	12.00	4.60	8.61	2.04	9.33	0.63	0.30	0.92	4.11	13.62	6.24	10.70	73.10
1999-2000	12.25	18.04	0.41	2.19	1.11	1.02	2.18	5.40	2.05	1.63	4.81	3.93	55.02
2000-2001	10.17	12.88	2.05	4.08	1.19	0.40	6.99	0.92	5.41	9.12	10.96	12.02	76.19
2001-2002	18.95	5.81	2.48	2.94	0.76	6.71	1.47	3.62	1.36	10.11	9.58	7.58	71.37
2002-2003	6.02	3.20	3.22	3.60	0.19	1.60	8.64	4.90	10.74	4.91	1.77	7.56	56.35
2003-2004	5.91	2.50	6.06	3.19	1.77	2.25	0.64	1.62	3.20	3.18	6.38	8.35	45.05
2004-2005	22.28	1.30	1.05	1.02	1.38	2.50	5.18	2.09	5.23	10.57	1.85	8.12	62.57
2005-2006	4.54	11.25	4.38	1.43	0.44	3.15	0.49	3.13	1.64	8.43	5.81	11.25	55.94
2006-2007	5.04	2.14	1.92	3.80	0.45	1.77	1.06	2.88	4.07	12.36	8.19	4.06	47.74
2007-2008	12.27	6.83	3.13	3.41	1.08	3.94	4.41	2.48	4.56	7.70	5.99	11.15	66.95
2008-2009	6.36	6.34	1.82	6.34	0.41	1.20	4.86	1.87	10.17	8.07	8.65	6.90	62.99
2009-2010	3.51	0.79	4.72	6.89	1.57	3.02	9.08	5.34	2.79	10.37	5.42	11.70	65.20
2010-2011	8.36	1.49	2.21	1.11	3.62	0.66	3.27	2.89	3.48	5.00	4.74	9.70	46.53
2011-2012	8.07	8.73	2.22	0.98	3.62	5.89	2.67	1.66	7.97	6.81	3.85	16.44	68.91
2012-2013	7.60	5.61	1.88	8.45	1.77	2.27	1.23	5.42	8.00	11.65	5.49	7.60	66.97
2013-2014	12.18	0.81	6.88	2.69	7.83	2.13	5.15	2.19	4.46	9.41	8.90	8.50	71.13
2014-2015	8.29	4.93	2.02	0.92	0.00	6.47	2.22	5.25	2.72	5.39	8.61	9.25	56.07
2015-2016	10.15	0.95	4.34	9.14	7.85	3.77	7.01	1.01	9.99	6.32	3.79	8.70	73.02
2016-2017	5.58	3.61	0.19	1.94	1.67	3.88	1.04	5.60	3.37	11.45	10.94	2.88	52.15
2017-2018	9.68	13.00	5.18	1.27	3.75	0.26	0.12	5.25	14.72	13.29	7.21	6.01	79.74
AVG	8.88	5.44	4.41	3.43	3.07	2.98	4.18	3.07	5.38	8.09	6.03	7.84	62.79

Table 3: Town of Jupiter Water Department (TOJ) Rainfall

Historical Rainfall Data (inches)													
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
1976-1977	4.65	4.62	3.20	0.80	3.33	1.70	0.70	2.09	3.00	5.20	5.80	8.25	43.34
1977-1978	14.06	2.90	2.97	7.70	4.80	2.60	3.40	0.25	4.15	11.95	13.15	10.71	78.64
1978-1979	9.45	3.40	7.30	16.39	5.05	0.22	1.34	3.98	6.14	4.31	2.63	5.49	65.70
1979-1980	16.86	5.98	4.54	1.58	5.00	2.67	1.91	2.50	6.12	3.61	9.69	5.22	65.68
1980-1981	6.65	6.33	4.83	2.00	0.62	3.11	1.12	0.46	4.60	6.16	3.27	15.65	54.80
1981-1982	7.20	2.56	1.75	0.36	1.70	6.54	14.70	8.24	14.14	13.25	2.82	6.97	80.23
1982-1983	7.94	2.16	22.49	2.59	6.26	8.10	5.11	4.29	3.38	9.40	3.25	8.30	83.27
1983-1984	15.21	8.29	3.94	7.20	0.79	3.49	6.50	2.97	9.04	2.30	6.13	3.65	69.51
1984-1985	10.23	2.40	13.80	0.17	1.13	0.29	1.88	6.66	1.95	4.66	4.65	4.49	52.31
1985-1986	15.65	5.15	0.73	4.02	5.38	2.23	14.00	0.28	1.19	13.60	5.44	5.25	72.92
1986-1987	4.24	6.75	6.13	6.49	1.86	5.17	7.58	0.34	3.57	7.18	3.68	3.28	56.27
1987-1988	9.07	8.12	13.58	0.31	3.86	5.94	3.51	1.48	7.10	7.98	8.79	8.60	78.34
1988-1989	2.41	2.53	2.40	1.11	1.04	0.53	4.46	3.90	2.60	3.07	5.69	4.87	34.61
1989-1990	2.47	3.21	1.24	2.54	1.35	1.40	5.95	1.94	5.07	2.32	4.07	4.60	36.16
1990-1991	8.81	2.90	1.43	1.83	10.86	3.15	3.32	2.59	6.65	8.28	6.29	3.06	59.17
1991-1992	6.38	5.42	3.02	1.31	1.74	4.16	3.81	3.58	1.50	15.44	2.61	10.40	59.37
1992-1993	9.35	1.66	9.90	0.95	18.13	3.64	5.22	1.97	2.62	8.45	2.79	3.11	67.79
1993-1994	9.89	11.59	6.06	0.94	4.15	4.47	2.26	4.99	4.85	10.02	6.67	10.09	75.98
1994-1995	10.11	7.20	11.83	8.13	3.00	1.76	3.25	4.50	0.56	9.62	10.56	13.22	83.74
1995-1996	5.94	22.32	1.39	2.36	1.04	1.64	13.61	2.04	9.45	9.13	6.56	7.27	82.75
1996-1997	6.05	7.81	5.48	1.71	3.95	2.31	4.25	7.16	4.97	14.56	7.96	14.48	80.69
1997-1998	9.02	2.80	2.99	5.14	6.43	7.73	5.39	3.03	3.35	4.00	6.48	6.53	62.89
1998-1999	13.46	5.60	9.95	1.91	10.83	0.83	0.26	1.01	3.64	14.35	7.93	9.77	79.54
1999-2000	14.92	18.09	0.73	2.59	1.06	1.22	3.28	6.27	1.50	1.10	4.61	1.75	57.12
2000-2001	9.50	12.44	1.54	2.79	1.24	0.32	5.81	0.99	4.24	9.70	9.72	11.99	70.28
2001-2002	18.47	6.27	3.11	2.64	0.70	7.68	1.24	5.05	0.76	13.32	9.36	6.96	75.56
2002-2003	5.75	3.46	3.59	3.66	0.23	1.76	9.22	5.50	10.09	4.07	1.90	9.83	59.06
2003-2004	5.70	2.05	6.14	3.67	1.77	2.46	0.85	1.60	2.78	2.83	3.89	8.00	41.74
2004-2005	27.63	1.28	1.09	1.11	1.50	1.53	7.93	2.27	4.46	11.96	2.43	8.63	71.82
2005-2006	6.89	10.51	5.08	1.70	0.56	2.75	0.46	3.55	1.63	8.00	4.07	10.69	55.89
2006-2007	5.43	2.21	1.35	7.62	0.50	2.40	0.77	3.17	3.80	15.62	9.45	3.79	56.11
2007-2008	10.21	8.21	1.56	2.42	1.10	4.21	4.59	3.07	3.78	9.03	6.08	13.60	67.86
2008-2009	6.25	5.55	1.51	1.90	0.23	1.65	6.12	1.87	10.40	9.81	8.34	5.60	59.23
2009-2010	2.22	1.22	2.25	6.90	1.61	2.25	7.90	4.26	2.56	7.59	3.30	10.72	52.78
2010-2011	8.48	0.63	1.42	0.43	1.89	0.53	2.56	1.19	3.65	4.48	7.64	11.03	43.93
2011-2012	9.04	8.20	2.41	1.09	1.44	5.13	4.18	1.86	9.35	7.11	6.45	21.36	77.62
2012-2013	7.60	7.43	2.77	10.15	1.48	2.56	1.44	4.54	5.33	13.35	5.25	7.89	69.79
2013-2014	12.64	1.05	5.58	2.85	9.07	2.33	6.97	2.53	6.02	10.59	11.31	9.66	80.60
2014-2015	8.64	6.28	3.34	1.86	1.42	7.84	1.61	4.34	2.28	4.08	7.32	6.08	55.09
2015-2016	9.94	0.86	3.75	8.89	12.01	3.46	7.30	1.03	8.29	3.54	3.75	5.54	68.36
2016-2017	5.50	3.36	0.06	2.21	5.70	3.19	0.70	6.17	2.33	11.37	6.67	2.04	49.30
2017-2018	8.99	9.70	5.56	1.05	3.73	0.64	0.63	5.26	16.47	11.57	8.97	3.31	75.88
AVG	9.26	5.73	4.61	3.41	3.56	3.04	4.45	3.21	4.98	8.28	6.13	7.90	64.56

Table 4: SFWMD Palm Beach County-Wide Rainfall Averages

Historical Rainfall Data (inches)													
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
30 Year Avg. (1981-2010)	8.49	5.56	4.15	2.92	2.96	2.88	4.12	3.23	4.66	8.20	6.54	8.06	61.77
1995-1996	6.26	15.06	1.10	1.52	1.54	0.53	7.09	2.49	8.01	8.46	4.63	4.75	61.44
1996-1997	7.17	6.78	2.26	1.77	3.87	4.73	3.37	5.47	3.74	12.67	5.64	10.10	67.57
1997-1998	7.52	1.44	3.93	5.02	5.23	6.93	4.33	2.32	1.71	2.51	7.29	4.85	53.08
1998-1999	13.93	2.91	9.85	2.99	7.26	1.50	0.50	2.72	2.58	15.41	3.22	8.20	71.07
1999-2000	8.94	12.66	3.16	1.69	1.28	0.78	3.58	4.72	1.08	3.59	6.74	4.36	52.58
2000-2001	5.02	7.39	2.60	1.83	0.78	0.26	5.57	0.40	4.44	6.57	9.41	7.95	52.22
2001-2002	15.14	5.77	2.02	2.16	0.51	5.11	1.20	2.60	1.80	12.59	7.97	5.05	61.92
2002-2003	4.04	2.35	2.75	2.88	0.48	1.17	4.42	3.85	8.45	6.35	3.85	8.92	49.51
2003-2004	5.51	1.27	4.77	2.69	2.54	2.69	0.78	2.38	2.22	3.14	5.03	7.70	40.72
2004-2005	17.71	2.94	0.75	0.85	1.23	1.09	5.87	1.72	5.72	12.45	4.84	2.80	57.97
2005-2006	7.30	7.22	4.49	1.44	0.67	2.80	1.31	2.38	4.09	4.48	6.03	7.32	49.53
2006-2007	6.68	1.48	2.27	5.47	0.74	1.31	0.51	2.64	3.35	12.41	8.73	6.05	51.64
2007-2008	8.11	8.77	0.68	1.76	1.87	4.56	5.48	2.92	3.12	7.03	6.52	11.04	61.86
2008-2009	6.77	5.37	0.76	1.24	0.17	0.34	3.46	1.48	10.12	8.44	6.57	5.76	50.48
2009-2010	6.90	1.31	2.93	5.84	1.66	3.34	7.72	5.62	3.91	4.85	4.82	9.25	58.15
2010-2011	7.89	0.93	1.17	1.02	2.24	0.58	2.36	1.24	2.46	4.79	5.41	9.84	39.93
2011-2012	7.06	9.35	1.28	1.05	0.30	2.99	2.42	4.90	8.48	7.49	5.45	16.30	67.07
2012-2013	6.68	6.47	0.69	1.64	1.07	2.71	1.17	4.45	11.06	9.91	9.50	4.38	59.73
2013-2014	8.15	0.81	3.82	1.39	7.02	1.73	2.54	1.72	3.60	7.79	8.55	7.34	54.46
2014-2015	9.10	4.39	1.66	1.20	0.74	4.37	1.20	4.27	1.57	4.41	5.50	7.21	45.62
2015-2016	8.01	1.94	3.29	3.75	9.18	2.58	2.39	1.19	7.11	8.63	5.38	8.20	61.65
2016-2017	6.10	5.04	0.30	1.65	1.66	2.37	1.49	3.66	4.20	13.14	5.60	6.20	51.41
2017-2018	9.24	12.54	4.39	1.02	2.80	0.47	0.52	6.02	15.13	7.78	6.65	5.41	71.97

Monthly Averages are based on information provided by the South Florida Water Management District. These are weighted averages based on data from recording stations located throughout Palm Beach County. The 30 Year Average is an unofficial average of rainfall in eastern Palm Beach County for the period of 1981-2010.

Table 5: 2017-2018 North County Rainfall Average

Historical Rainfall Data (inches)													
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
SIRWCD Avg.	12.42	18.46	7.20	1.23	3.81	0.49	0.52	5.74	17.71	17.00	11.45	9.10	105.13
LRD Avg.	9.68	13.00	5.18	1.27	3.75	0.26	0.12	5.25	14.72	13.29	7.21	6.01	79.74
TOJ Avg.	8.99	9.70	5.56	1.05	3.73	0.64	0.63	5.26	16.47	11.57	8.97	3.31	75.88
N. County Avg.	10.36	13.72	5.98	1.18	3.76	0.46	0.42	5.42	16.30	13.95	9.21	6.14	86.92

N. County Avg. is based on the average monthly rainfall data from SIRWCD, the Loxahatchee River Environmental Control District (LRECD), and the Town of Jupiter Water Department (TOJ) through August 31, 2018.

Table 6: SIRWCD 2017-2018 Rainfall Analysis

Historical Rainfall Data (inches)													
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	TOTAL
SIRWCD 2017-2018	12.42	18.46	7.20	1.23	3.81	0.49	0.52	5.74	17.71	17.00	11.45	9.10	105.13
30 Year Avg. (1981-2010)	8.49	5.56	4.15	2.92	2.96	2.88	4.12	3.23	4.66	8.20	6.54	8.06	61.77
N. County Avg.	10.36	13.72	5.98	1.18	3.76	0.46	0.42	5.42	16.30	13.95	9.21	6.14	86.92

N. County Avg. is based on the average monthly rainfall data from SIRWCD, the Loxahatchee River Environmental Control District (LRECD), and the Town of Jupiter Water Department (TOJ) through August 31, 2018. Refer to *Figure 19* for a graphical representation of this data.

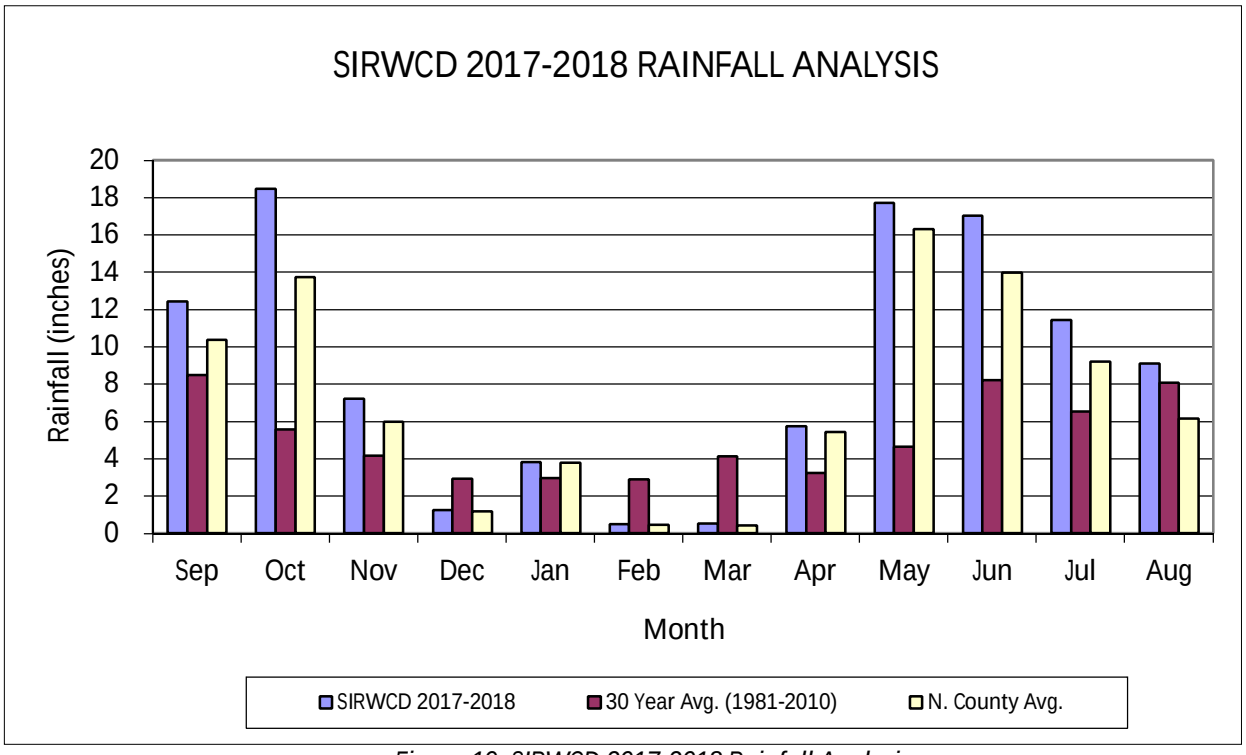

Figure 19. SIRWCD 2017-2018 Rainfall Analysis

Table 7: 2017-2018 Annual Cumulative Rainfall Comparison

Historical Rainfall Data (inches)												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
SIRWCD 2017-2018	12.42	18.46	7.20	1.23	3.81	0.49	0.52	5.74	17.71	17.00	11.45	9.10
30 Year Avg. (1981-2010)	8.49	14.05	18.20	21.12	24.08	26.96	31.08	34.31	38.97	47.17	53.71	61.77
N. County Avg.	10.36	24.08	30.06	31.25	35.01	35.47	35.90	41.31	57.61	71.57	80.78	86.92

The annual cumulative totals include the average monthly figures plus the prior monthly averages of the report year. Refer to *Figure 20* for a graphical representation of this data.

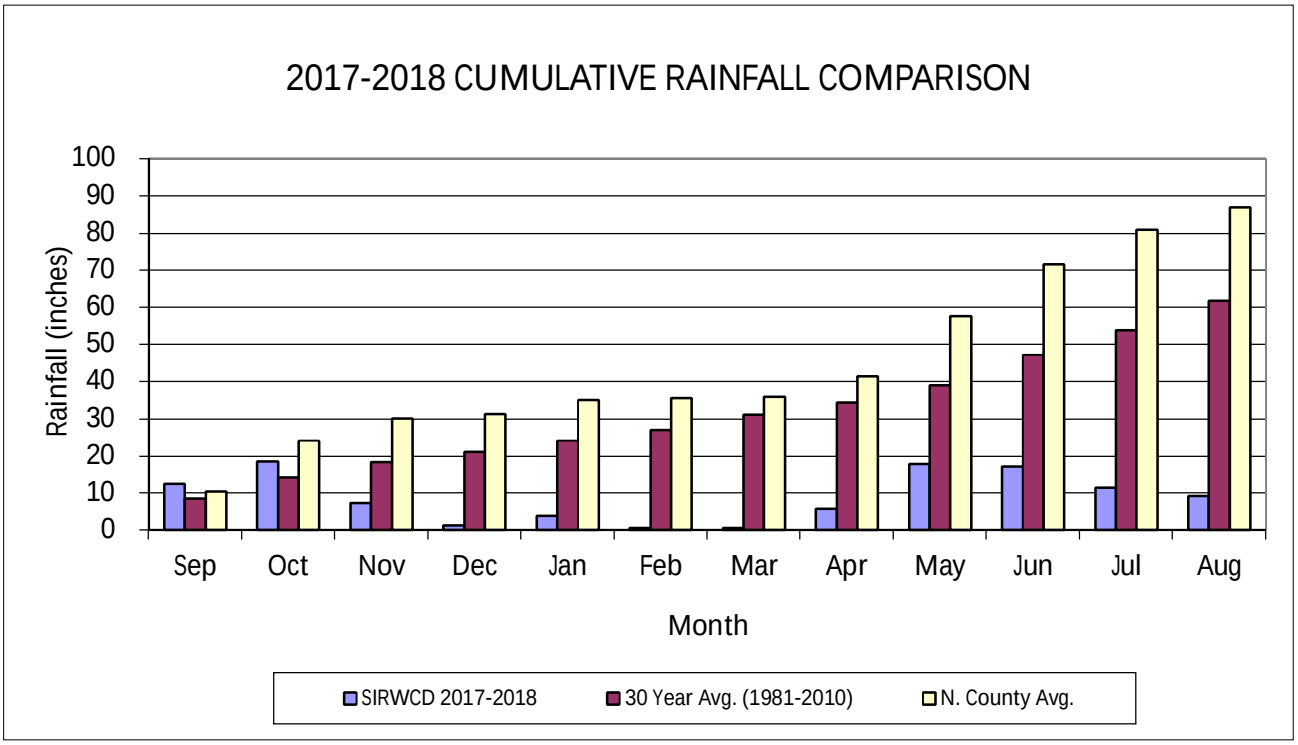

Figure 20. 2017-2018 Cumulative Rainfall Comparison

General Operation and Maintenance

Figure 21. Canal Maintenance

The District's Manager of Operations Annual Report is included in this document as Appendix A. It offers a summary of significant events and issues that have been identified by the Operations Manager. The Operations Manager and staff of the District are the agents for day to day activities. They are primarily focused on maintaining the primary and secondary elements of the surface water management system and the graded roadways throughout the District. Further, the Operations Manager facilitates interagency coordination with other public entities that operate and maintain assets within the District such as Palm Beach County Road and Bridge Division, Palm Beach County Parks and Recreation, Palm Beach County Fire Control, School District of Palm Beach County, Florida Department of Transportation, South Florida Water Management District, Town of Jupiter, the Loxahatchee River Environmental Control District, and others.

Each year, a portion of this report is utilized to state that the District's surface water management system is designed, operated, and maintained for a mostly rural residential community with some commercial, industrial, and urban residential areas. Accordingly, certain low-lying areas within the District will experience ponding and storage of water during the wet season and following significant storms. Swales will have standing water, and many areas will be saturated for extended periods of time during the wet season. The continued development of low-lying areas in the District will result in a commensurate consumption of storage within the District's watershed. Where ponds are excavated on individual lots to supply the fill for house pads and related improvements, the consumption of available storage is not as severe because the pond serves as a compensating factor. Unfortunately, many landowners have decided to fill in their ponds and the storage is being reduced. Due to these instances, the District has been working with Palm Beach County to enforce its rules concerning the filling of lots beyond what the Palm Beach Code allows. Palm Beach County is now implementing their code through a permit process and they have asked landowners to notify them possible activities. These issues are regularly discussed by the Board of Supervisors and District staff at the monthly meetings, with individual landowners, in forums and meetings within the District, and within the District's newsletter and other publications distributed throughout the District. The District's Board of Supervisors and staff work to assure that the surface water management system functions to the extent of its permitted capacity while recognizing the regulatory requirements imposed on the District by other agencies. All of the District work must be implemented within the adopted budget and utilization of existing manpower, equipment and any other resources available to accomplish the tasks.

General Comments

With approximately 90% of the District developed, operation and maintenance activities are the main focus. The District continues activities involving site specific drainage improvements that impact landowners, canal and culvert maintenance, and replacement or renewal of facilities that affect the works of the District. The District also continues to operate and maintain roadways and a park, as well as plan new capital and landowner initiated improvements. The staff investigates whether improvements should be made to other existing infrastructure, such as canals, bridges, or drainage structures.

The goals and objectives of SIRWCD are not inconsistent with those being discussed for the Loxahatchee River Watershed Restoration Project Delivery Team, the Loxahatchee River Management Coordinating Council, Department of Environmental Protection, Corps of Engineers, and South Florida Water Management District. However, the necessary ingredient is that all of these entities, including the District, must identify and implement action plans that merge the goals of each agency into a functional and affordable outcome. To that end, the District is exploring how it can improve its surface water management system while at the same time contributing to the enhancement of the Loxahatchee Slough and Loxahatchee River.

SIRWCD will continue to serve its landowners by providing support during emergency situations, maintaining and operating the surface water management system at optimal levels, and providing services that coincide with the system capabilities, board policies, and the community.

AECOM appreciates the opportunity to continue serving as your District Engineer, and we look forward to working with the Board of Supervisors, landowners, and staff in the coming year.

Appendix A

South Indian River
Water Control District™

Manager's Report for October 2017 through September 2018

From Hurricane Irma to one of the wettest summers in history, South Indian River Water Control District has truly earned the title of "Water Control District". Despite the rains, we have seen the benefits related to our drainage projects and maintenance programs that have been implemented over the past couple of years. The wet weather has also exposed areas that are still in need of improvement.

For those who are new property owners in the District, here is an overview of the drainage system. South Indian River Water Control District (SIRWCD) is a gravity fed storm water discharge system that functions as a dual basin system. Palm Beach Country Estates, Jupiter Park of Commerce, and Egret Landing are east of South Florida Water Management District's (SFWMD) Canal 18 and Jupiter Farms is west of Canal 18. In the system on the east side of the C-18, there are 15 miles of canals that drain west to east through 4 set elevation weirs prior to entering the Florida Turnpike's east borrow canal. Waters are then routed towards the southwest fork of the Loxahatchee River. On the west side of the C-18, there are 45 miles of canals that drain west to east through 5 water control structures to SIRWCD's Canal 14 then north the NW Fork of the Loxahatchee River. During heavy rainfall events, we receive assistance from SFWMD by way of the G-92 structure west of the C-18 and the PC8-A riser culvert in Palm Beach Country Estates.

On September 10, 2017, Hurricane Irma made landfall as a Category 3 storm in Key West. The storm dumped 8"of rain throughout the District and toppled numerous trees along the canals and roadway's. Despite the amount of rainfall, there were no reports of street flooding or any major drainage concerns. You might ask, "What limited the standing water?" Well, in addition to having the swales and canals for drainage, we also rely on the land for percolation. August was a very dry month. In fact, we only received 2" of rain when we average 10". The landscape was able to absorb most of the rainfall from the hurricane and keep the standing water to a minimum. Within 24 hours, the canals were back at operating levels.

That was not the case with the storm event of October 5, 2017, when 6"of rain fell in just over 2 hours, in the Jupiter Farms area. The persistent rain that followed after Hurricane Irma kept the ground saturated. Then that 6" of rain was more than the landscape could handle and the drainage system was overwhelmed. It took 72 hours for the canals to return to operating levels. What occurred on that October day is very difficult to prepare for; in fact, it is easier to prepare for a Hurricane.

The rainy season has been one for the record books. From May through August we recorded 55.26" of rain with some of the western sections of the District recording over 60". We received 85% of our annual rainfall in 4 months! Needless to say, this year's weather has delayed our day to day maintenance operations as well as District projects throughout the summer.

The Districts maintenance operations include road grading, mowing, swale and canal restoration, and culvert installation. Other areas that are subcontracted include aquatic weed control, water quality testing, and park maintenance. The District also interacts with other agencies and municipalities to provide service and information within the community. They include Palm Beach County Sheriff's Office, Fire Rescue, Road and Bridge, Engineering, and Code Enforcement. South Florida Water Management District, Solid Waste Authority, Safety Council of Palm Beach, Florida Association of Special Districts, The Loxahatchee River Preservation Initiative, The Loxahatchee River Coordinating Council, and The Department of Environmental Protection.

The District has approximately 100 miles of dirt roads and 87 miles of paved roads. The dirt roads are graded on average once a week and when needed, material is brought in to re-stabilize the road surface. The saturated conditions throughout the summer made it challenging to keep the roads in good condition and we received numerous calls related to "potholes" in the road. Wet roads are notorious for potholes and grading provides limited benefits. Grading destabilizes the road surface until local traffic can compact the material. The problem is, if the material is still wet, rather than compaction, the traffic will "push" the material which results in potholes. Over the past few years, "Best Management Practices" have been put into place to crown roads for storm water runoff. This procedure minimizes erosion and standing water which can contribute to the development of potholes within the roadway. Potholes are generally not an issue in the dry season, but we do receive calls for "ripples". Ripples develop when the surface of the road lacks moisture and becomes destabilized. Traffic moves the loose material back and forth until tiny waves or ripples develop. Again grading the road offers temporary relief. It takes the right amount of moisture to create significant compaction and extend the quality of the road. In addition to the weather, landscape debris that is placed out in the roadway affects our grading operations. We cannot properly grade roads that are overrun with debris. (FYI - SIRWCD does not pick up debris. That is the responsibility of the Solid Waste Authority.)

Paved roads are inspected annually and when needed, resurfaced with asphalt or micro-overlay. All road paving projects are landowner initiated.

The District's mowing operations have also been affected by the wet conditions. The District has 60 miles of canals and approximately 360 miles of roadside and outfall drainage swales. Normally, it takes 6-8 weeks to complete the schedule, but the wet conditions extended this by 3-4 weeks. The District has a "Do Not Mow List" for those landowners who choose to mow their own easements. You can contact our office for more information.

In March of 2016, The Board of Supervisors passed the driveway culvert replacement program. To date, the District has installed over 400 driveway culverts in Jupiter Farms and Palm Beach Country Estates. This program was created to replace inoperable culverts and ensure proper elevation. This program has been so successful that we now have a crew with equipment and materials to increase our installs from 4 to 8 per week. Though the District will install the culvert, it's still the responsibility of the landowner to maintain the culvert and keep it free of sediment buildup. To find out whether your culvert is in need of replacement or not, call our office for an inspection.

Along with culvert replacements, we are also focusing our attention on cleaning out and re-contouring roadside and drainage outfall swales, both a part of the District's secondary drainage system. Swales are designed for stormwater runoff, retention, and percolation and are also used to move stormwater to the main canals. If not properly constructed, they could create negative impacts to the drainage system. By clearing and widening the existing ditches and regulating the outfalls, stormwater can be effectively collected, treated and conveyed to surrounding District canals. These improvements to the secondary drainage system are more important than ever, now that the District is over 90% capacity. Opportunities for water retention are lost when vacant lots are developed and filled in. Widening the swales will help with retention and percolation. Water quality is also improved when swales are cleaned and vegetation is removed, by reducing the amount of decaying oxygen-consuming organic matter in the stormwater.

We regularly inspect our major canal and outfall systems for District culvert replacements and vegetation removal. The work is performed in-house or subcontracted, depending on the scope of work. These projects ensure maximum performance of the drainage system and create total access to our canal and outfall Rights-of-Ways and Easements. We also interact with Palm Beach County Road and Bridge to relay information related to the condition of numerous County culverts that are located in the District.

The District continues to apply regulated and permitted herbicides in the canal and outfall systems for the control of aquatic weeds. These systems are checked regularly and sprayed on an as needed basis.

Each year, operators are trained to identify any illicit discharge that enters the drainage system. When an illicit discharge is identified, the DEP is contacted and the discharge is logged as part of our Annual National Pollutant Discharge Elimination System (NPDES) report. If you witness any activity involving illicit discharge or illegal dumping, please call our office immediately.

Safety is an important part of our operations. This year operators participated in the Florida Underground Storage Tank Class C Operator Training. Each operator was trained to identify and respond to emergency fuel spill situations. The District also conducts safety meetings for its employees on a quarterly basis to discuss concerns and learn how to implement safety related practices to the day to day operations. Employees can also attend seminars sponsored by the Safety Council of Palm Beach County. These training seminars keep safety at the forefront of our operations. In fact, for the 20th consecutive year, the District has received awards in vehicle and employee safety from the Safety Council.

This year, Operations Superintendent, Matt Wood, completed the Certified District Manager training program sponsored by the Florida Association of Special Districts. This educational program ensures that District Managers comply with the Florida Statutes governing Special Districts.

For more information about SIRWCD, you can visit our website at www.sirwcd.org, call us at 561-747-0550 or feel free to come by our office at 15600 Jupiter Farms Rd. We are open Monday through Friday, 8:00am-4:30pm.

SIRWCD
15600 Jupiter Farms Road
Jupiter, Florida 33478
T 561.747.0550
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About SIRWCD

South Indian River Water Control District (SIRWCD) was formed pursuant to Chapter 298, Florida Statutes in July of 1923. The initial works of SIRWCD were comprised of primary drainage canals, mainly used for agricultural purposes. In the mid 1960's, most of the property within the District was registered with the Florida Land Installment Sales Board for sale as a home site subdivision. Today, SIRWCD consists of approximately 12,500 acres and serves approximately 7,323 parcels with facilities such as canals, roads, swales, control structures, and parks.

More information on SIRWCD and its services can be found at www.sirwcd.org.