

## **SECTION 1 – INTRODUCTION**

This Fiscal Sustainability Plan (FSP) has been prepared for the Avondale Stormwater Improvement Project for the City of Pompano Beach. The purpose of this document is to assist the City with comprehensive fiscal planning for the long-term management of the new stormwater infrastructure associated with this project. This FSP applies to new stormwater infrastructure installed under this project.

### **PROJECT PURPOSE**

Based on the City's Stormwater Master Plan completed in 2013, the Avondale Neighborhood was identified as priority drainage basin in need of stormwater system improvements based on the historical flooding problems observed by City staff, the flooding complaints received from residents, and the results from the existing conditions stormwater model. In general, the Avondale Neighborhood is bound by I-95 to the west, SW 3<sup>rd</sup> Street to the south, Dixie Highway to the east and Atlantic Boulevard to the north. The neighborhood encompasses approximately 92 acres of land area. The Avondale Neighborhood primarily consists of residential properties with multi-family units. The City of Pompano Beach operates and maintains its own stormwater management facilities within City right-of-way to provide flood control and water quality treatment within the neighborhood. The existing drainage facilities within the neighborhood include interconnected catch basin inlets which discharge via three existing outfalls into the Old Pompano Canal. The City's Stormwater Master Plan identified the Avondale Neighborhood to be a priority area in need of stormwater infrastructure improvements to alleviate the flooding problems throughout the neighborhood.

The Avondale Neighborhood typically experienced significant flooding throughout the area during heavy rainfall events. Based on the results of the existing conditions stormwater model along with the observations by City staff, the flooding problem area was centered on SW 4<sup>th</sup> Avenue along with the adjacent intersecting roadways where most of the critical flooding occurs. The flooding problems within the Avondale Neighborhood were created primarily by the topography within the neighborhood along with variations in the water levels within Old Pompano Canal (SFWMD G16 Canal). In general, the surrounding roadways which form the perimeter around the neighborhood have a relatively higher ground surface elevation compared to the majority of the internal neighborhood roadways. This ground surface topography allows stormwater runoff to flow into the neighborhood from these perimeter roadways and also tends to trap any stormwater runoff within the neighborhood. The ground surface elevation within the public right-of-way areas typically range between 3.5 feet and 5.5 feet NAVD, which is relatively low when compared to the groundwater elevation and tailwater elevation at the existing drainage outfalls into the SFWMD G16 Canal. The canal levels within the SFWMD G16 Canal can also become elevated during and after significant rainfall events which limits the discharge capacity of these existing stormwater outfalls. Each of these factors led to the past flooding problems which have been observed within the Avondale Neighborhood.

The existing drainage system within the Avondale Neighborhood consisted of gravity pipes collecting stormwater runoff from the public right-of-way areas to eventually discharge to the SFWMD G16 Canal via three positive outfalls. The primary system was a network of interconnected drainage pipe ranging from 15-inches to 36-inches in diameter which collects stormwater runoff from the central and western portions of the study area for eventual discharge into the SFWMD G16 Canal via 36-inch outfall pipe. There are also two small independent systems with smaller outfalls into the SFWMD G16 Canal, which serve the northeast portion of the neighborhood. Although there were existing stormwater facilities within the Avondale Neighborhood, it did not provide an adequate level of service to the right-of-way areas within the neighborhood. In order to alleviate the previous flooding problems within the Avondale Neighborhood, stormwater improvements were implemented to enhance the performance of the existing stormwater management system within the neighborhood.

The primary purpose of the Avondale Stormwater Improvement Project was to reduce the flooding depth and duration within the neighborhood during significant storm events. Based on the analysis from the Stormwater Master Plan, the implementation of a stormwater pumping system into the SFWMD G16 Canal was identified to be the most effective option for reducing the peak flood stage and reducing the flood duration within the Avondale Neighborhood by increasing the discharge rate via the existing outfalls when the canal levels are elevated.

#### **STORMWATER IMPROVEMENTS**

During the design phase of this project, a Basis of Design Report was prepared to identify the most effective stormwater improvements that should be implemented within the Avondale neighborhood. According to the results of this design evaluation, the most effective stormwater improvements within the Avondale Neighborhood would include the implementation of the following system improvements:

- Convert an existing gravity outfall into a new stormwater pump station
- Expand the drainage pipe network to connect to the new stormwater pump station
- Install new exfiltration trench to provide additional storage capacity for stormwater runoff
- Install new backflow prevention valves at two existing gravity outfalls
- Restore roadway swale areas to provide additional storage capacity for stormwater runoff

#### **SECTION 2 – ASSET INVENTORY**

The Avondale Stormwater Improvements included the installation of the following stormwater infrastructure assets within the public right of way areas throughout this neighborhood:

- Concrete Drainage Structures (63)
- RCP Drainage Pipe (4,023 LF)
- RCP Exfiltration Trench (2,744 LF)
- Restored Roadway Swale Areas (30,800 SY)
- Backflow Prevention Valves (2)
- Stormwater Pump Station (1)

Please refer to Exhibit 1 – Stormwater Infrastructure Inventory within this report for a detailed breakdown of the new stormwater infrastructure implemented under the Avondale Stormwater Improvement Project.

#### **SECTION 3 – WATER AND ENERGY CONSERVATION EFFORTS**

In regards to any water conservation efforts, the proposed stormwater improvements within the Avondale neighborhood were designed to maximize the quantity of stormwater runoff retained on-site within new exfiltration trench and new roadway swale areas. Both of these components of the stormwater improvements within the Avondale neighborhood will allow stormwater runoff to infiltrate into the ground surfaces, which promotes the recharge of the groundwater.

The energy usage by the new stormwater pump station within the Avondale neighborhood will be controlled by the frequency and intensity of rainfall in the area. In regards to any energy conservation efforts, the proposed improvements were designed to minimize the stormwater runoff directed to the new stormwater pump station as feasible to minimize the operation of the pumps along with the associated energy usage. As site conditions within the Avondale neighborhood, the proposed stormwater improvements maximized the new exfiltration trench and new roadway swale areas, which provided additional storage capacity for stormwater runoff and will reduce the quantity of stormwater reaching the stormwater pump station.

#### **SECTION 4 – MAINTENANCE PLAN**

The existing stormwater management system requires a significant operations and maintenance effort by the City to ensure that it continues to operate at full capacity while complying with all regulatory requirements. The operations and maintenance of the stormwater management system is an on-going effort, which includes the routine inspection of drainage structures, the routine cleaning of drainage structures and piping, the repair of any damaged drainage structures, the replacement of any collapsed piping, the removal of any sediments and debris from the system, and annual compliance with regulatory programs. An adequate operations and maintenance program is necessary to limit flooding problems throughout the City during rainfall events.

The routine maintenance of drainage piping and structures on an annual basis is necessary to remove any sediment from the stormwater management system. Typically, sediments can accumulate within the drainage structures and drainage piping over time if the drainage system does not undergo routine cleaning. The accumulation of sediments within the drainage piping can significantly reduce the transmission capacity of the pipe, limit the discharge capacity from system outfalls, and slow the percolation rate via exfiltration trenches, which will slow the draining of stormwater runoff from the right-of-way areas during a rainfall event. The accumulation of sediments within the stormwater management system can also negatively impact the water quality within receiving water bodies when pollutant loading is transmitted within the stormwater runoff to the outfalls. The routine maintenance of outfalls from the stormwater management system into surface water bodies is also necessary on an annual basis. In coastal areas such as the City of Pompano Beach, many of the existing outfalls will have an accumulation of sediment and/or barnacles, which can negatively impact the performance of the existing stormwater management system. A partial blockage of the outfall pipe can significantly reduce the peak discharge capacity via the outfall, which will slow the draining of stormwater runoff from the right-of-way areas during a heavy rainfall event.

The routine inspection of drainage structures on an annual basis is necessary to identify any locations within the stormwater management system in need of system maintenance. According to the requirements of the NPDES Permit, all components of the stormwater management system must be inspected on a routine basis to ensure that it is operating appropriately. The new requirements of the NPDES Permit specify that the City must now inspect 10% of all drainage structures within the stormwater management system each year. The City must also prepare and submit an annual NPDES compliance report to FDEP for the structural controls and components of the stormwater management system. The City has also developed Standard Operating Procedures (SOPs) which have been developed to provide guidance on the frequency of inspections and maintenance activities related to the stormwater management system. The City must continue to track and report all routine inspection activities in order to meet the requirements of the NPDES Permit.

The City's Stormwater Management Utility provides funding for the operations and maintenance program for the existing stormwater management system. The primary role of the Stormwater Management Utility is to clean drainage structures and drainage pipe, to repair damaged drainage structures, to replace collapsed drainage piping, to remove collected debris and sediments from the system, and to inspect drainage structures on a routine basis. This effort is completed by staff members of the Stormwater Management Utility. The City Stormwater Management Utility tracks their performance measures on an annual basis which is outlined within table below.

**CITY OF POMPANO BEACH**  
**AVONDALE STORMWATER IMPROVEMENTS**  
**FISCAL SUSTAINABILITY PLAN (FSP)**

<b>Stormwater Management Utility Performance Measures</b>			
<b>Performance Measures</b>	<b>FY2015</b>	<b>FY2016</b>	<b>FY2017</b>
Structure Cleaning (EA)	1,656	1,998	1,849
Pipe Cleaning (LF)	92,118	102,660	102,073
Structure Repairs (EA)	45	75	14
Pipe Replacement (LF)	180	00	100
Debris Removal (TN)	264	417	554
Inspections (EA)	1,845	2,182	2,107

As part of the City's annual maintenance program for the overall stormwater management system noted above, the City will perform periodic inspections and maintenance of the new stormwater infrastructure within the Avondale neighborhood. Per the City's maintenance program, the operations and maintenance of the new stormwater infrastructure within the Avondale neighborhood will be an on-going effort, which will include the routine inspection of drainage structures, the routine cleaning of drainage structures and piping, the repair of any damaged drainage structures, the replacement of any collapsed piping, the removal of any sediments and debris from the system, and annual compliance with regulatory programs.

Please refer to Exhibit 1 – Stormwater Infrastructure Inventory within this report for a detailed breakdown of the new stormwater infrastructure implemented under the Avondale Stormwater Improvement Project along with the associated replacement costs.

**CITY OF POMPANO BEACH AVONDALE**  
**STORMWATER IMPROVEMENTS FISCAL**  
**SUSTAINABILITY PLAN**  
**EXHIBIT 1 - STORMWATER INFRASTRUCTURE INVENTORY**

INFRASTRUCTURE CATEGORY	INFRASTRUCTURE DESCRIPTION	QUANTITY	UNIT	ACCEPTANCE DATE	EXPECTED SERVICE LIFE	END OF SERVICE LIFE	EXPECTED REPLACEMENT COST	FUNDING SOURCE	ALTERNATE FUNDING SOURCE
STORMWATER PIPING	Reinforced Concrete Pipe (RCP) - 15"	725	LF	April 2019	30 years	April 2049	\$112,000	Stormwater Fees	
STORMWATER PIPING	Reinforced Concrete Pipe (RCP) - 18"	1,448	LF	April 2019	30 years	April 2049	\$234,000	Stormwater Fees	
STORMWATER PIPING	Reinforced Concrete Pipe (RCP) - 24"	1,246	LF	April 2019	30 years	April 2049	\$226,000	Stormwater Fees	
STORMWATER PIPING	Reinforced Concrete Pipe (RCP) - 30"	16	LF	April 2019	30 years	April 2049	\$4,000	Stormwater Fees	
STORMWATER PIPING	Reinforced Concrete Pipe (RCP) - 36"	588	LF	April 2019	30 years	April 2049	\$171,000	Stormwater Fees	
STORMWATER PIPING	Reinforced Concrete Pipe (RCP) - 18" Exfiltration	2,304	LF	April 2019	30 years	April 2049	\$789,000	Stormwater Fees	
STORMWATER PIPING	Reinforced Concrete Pipe (RCP) - 24" Exfiltration	440	LF	April 2019	30 years	April 2049	\$151,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - Type C Catch Basin	23	EA	April 2019	30 years	April 2049	\$195,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 48" Round Catch Basin	20	EA	April 2019	30 years	April 2049	\$194,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 60" Round Catch Basin	5	EA	April 2019	30 years	April 2049	\$55,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 48"x48" Catch Basin	2	EA	April 2019	30 years	April 2049	\$24,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 48" Round Manhole	6	EA	April 2019	30 years	April 2049	\$58,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 60" Round Manhole	2	EA	April 2019	30 years	April 2049	\$29,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 48" Control Structure	1	EA	April 2019	30 years	April 2049	\$12,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 48" Conflict Structure	1	EA	April 2019	30 years	April 2049	\$12,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 60" Conflict Structure	1	EA	April 2019	30 years	April 2049	\$19,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 6'x6'	1	EA	April 2019	30 years	April 2049	\$29,000	Stormwater Fees	
STORMWATER STRUCTURES	Precast Concrete Structure - 7'x7'	1	EA	April 2019	30 years	April 2049	\$36,000	Stormwater Fees	
FLOW CONTROL	Backflow Prevention Device - 24"	1	EA	April 2019	30 years	April 2049	\$39,000	Stormwater Fees	
FLOW CONTROL	Backflow Prevention Device - 36"	1	EA	April 2019	30 years	April 2049	\$62,000	Stormwater Fees	
FLOW CONTROL	Stormwater Pump Station - Dual Axial Flow Pumps	1	EA	April 2019	30 years	April 2049	\$1,620,000	Stormwater Fees	