

BROWARD COUNTY WATER AND WASTEWATER SERVICES ANNUAL REPORT FISCAL YEAR 2015



Our Best in Every Drop



Final Report Prepared July 2016 by
Brown and Caldwell, Inc.



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Section 1 Introduction

1.1 Purpose of the Report

The purpose of this Annual Report of Consulting Engineers for Water and Wastewater Services (WWS) of Broward County, Florida (County) is to provide the following:

- A review of the management and organization of WWS which operates the County water and wastewater systems (collectively, the Utility);
- A description of the Utility;
- A financial review of the Utility regarding historical and prospective debt service coverage, insurance requirements, and future system funding needs;
- A summary of projections of future impacts on the Utility, projections of revenues and expenses, and a review of the planned capital improvements of the Utility.

This report provides descriptions and observations of the Utility; the primary operating activities including the retail water and wastewater system which provides water and/or sewer service to approximately 56,591 customers and sewer only to approximately 2,799 customers, the North Regional Wastewater System which provides transmission, treatment and disposal services to other utilities on a wholesale basis and the Regional Raw Water System which provides raw water to other utilities; the water and wastewater capital improvement program (CIP); and the financial operations of the Utility.

Section 2 - Administration and Management

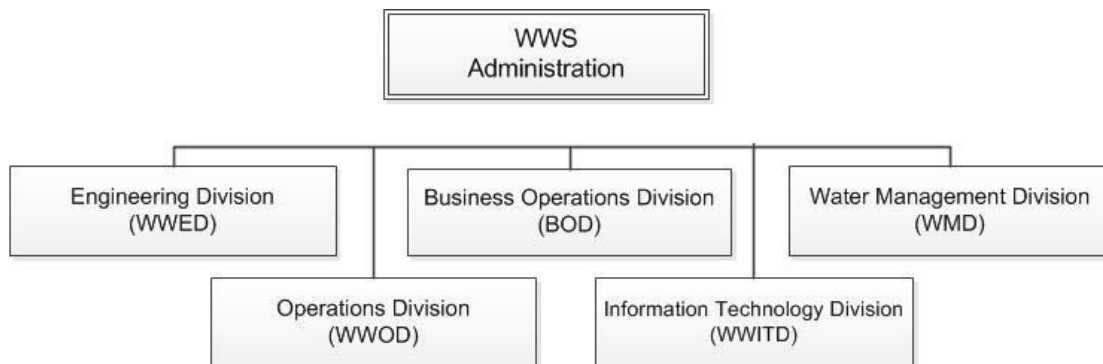
Section 2 Administration and Management

2.1 History and Organization of Water and Wastewater Services

The Broward County Utilities Division was established on January 31, 1962, with the County's purchase of a small, investor-owned water and wastewater utility. Between 1962 and 1975, the County acquired additional private utilities. In 1972, the Utility commenced construction of the North Regional Wastewater Treatment Plant (NRWWTP), and in 1975, the Utility began providing wholesale wastewater treatment service to large users. In 1976, to achieve fiscal consolidation, the County established uniform rates throughout its service areas. The water utility service area is divided into separate geographic districts; District 1 is served by Water Treatment Plant (WTP) 1A, District 2 is served by WTP 2A and District 3 is served by purchased water from the City of Hollywood, Florida.

Subsequent reorganizations created Water and Wastewater Services (WWS) consisting of five divisions. These divisions are Water and Wastewater Operations, Water and Wastewater Engineering, Water Management, Water and Wastewater Information Technology, and Business Operations. WWS operates within the Public Works Department, and is responsible for planning, construction, operation, maintenance, customer service, water management, and financial management of the Utility. Currently, WWS employs 352 people, including 21 certified water operators, 24 certified wastewater operators, 14 registered professional engineers, and 3 certified public accountants. There are 7 employees who are dual-certified as both water and wastewater operators. In addition, numerous employees hold recognized industry-specific certifications. An organizational chart, Figure 2-1, is provided below.

Figure 2-1 Water and Wastewater Services Organizational Chart



Under the County Code of Ordinances, the County exercises exclusive jurisdiction, control and supervision over the utility system or any part of a utility system owned, operated or maintained by the County. The Board of County Commissioners of Broward County, Florida (the Board) has the specific legal authority to fix, charge and collect from its customers, rates, fees, and charges, and to acquire, construct, finance and operate the Utility without supervision or

Section 2 - Administration and Management

regulation by any other political subdivision of the State (provided that environmental impacts are regulated as described herein).

2.2 Mission

The mission of Water and Wastewater Services (WWS) is multi-faceted. WWS is committed to performing as a benchmark comprehensive utility providing exceptional retail and regional water and wastewater management services and programs to its customers; and supporting continuous improvement while maintaining the quality of life in Broward County through sound environmental practices.

The overall goals established by WWS are as follows:

- To provide high quality and cost-effective services.
- To treat customers professionally and with the utmost respect.
- To operate the facilities and execute programs in a manner that protects the environment.
- To protect and enhance the natural resources of Broward County.
- To create and maintain a workplace in which employees are provided the opportunity to develop to their maximum potential.
- To maintain honesty and integrity in every aspect of the operation.

Water and Wastewater Services Administration

Water and Wastewater Services Administration manages and directs the activities of the five WWS divisions: Engineering, Business Operations, Information Technology, Operations, and Water Management. Administration approves operating and capital budgets, assures rates, fees, charges are sufficient to support fund activities and debt service requirements while providing appropriate coverage to maintain or enhance bond ratings; develops and implements financing plans for the successful implementation of the capital plan and policies to ensure environmentally safe water resources. Administration coordinates activities to identify efficiencies and synergies to reduce overall costs and enhance the delivery of services.

Administration also manages relationships with Large Users of the North Regional Wastewater System and the Regional Raw Water System. Administration coordinates the response to information requests from the County Commission and the general public. Administration promotes water conservation programs to benefit customers, preserve water resources and protect the environment; and monitors legislative and regulatory issues at local, regional, state and federal levels.

Section 2 - Administration and Management

WWS Administration highlights included:

- Water and Wastewater Services' water and sewer utility bonds maintained strong ratings— "Aa2", "AA+" and "AA" — from the three major rating services: Moody's, Fitch, and Standard & Poor's.
- The Retail Rates remained unchanged as compared to the previous fiscal year.
- The Regional Rates for wastewater and raw water were recalculated in conformance with large user agreements and recommended rates were approved by the Board for fiscal year 2015.
- Palm Beach County (PBC) and Broward County continued negotiations for the creation of a Regional Reclaimed Water System to support the NRWWS reclaimed water requirement under the Ocean Outfall legislation.

Water and Wastewater Operations Division

Water and Wastewater Operations Division (WWOD) is committed to supplying high quality raw and potable water; providing reliable water distribution and wastewater collection services; operating dependable transmission, treatment and disposal of wastewater services to large users in the north region of the County; and ensuring all services are delivered in a safe, efficient and cost-effective manner.

WWOD operates and maintains water treatment plants; re-pumping and storage facilities; lift stations, underground water distribution and sewage collection systems; and other support facilities. The division is responsible for the preparation and submittal of reports to comply with federal, state and local requirements (such as the Safe Drinking Water Act) and to ensure the reliable production of high-quality, safe, potable drinking water for our citizens. The division provides raw water from two regional wellfields to five large users and to Broward County retail operations as well as operates two retail wellfields that supply water to the County's 1A and 2A water treatment plants.

WWOD is also responsible for providing wastewater transmission, treatment and disposal services to eleven large users and to Broward County through the operation and maintenance of a regional wastewater treatment facility and related regional pumping stations. The division operates a reclaimed water facility, which provides reclaimed water to both industrial and retail customers. In addition, WWOD operates a state-certified laboratory, a nationally-recognized Industrial Pretreatment Program (IPP) and provides a critical environmental service through operating and maintaining a Septage Receiving Facility.

WWOD's highlights included:

- North Regional Wastewater Treatment Plant (NRWWTP) effluent ocean outfall nutrient reduction goals continue to exceed those established by the State of Florida in response to the ocean outfall legislation.

Section 2 - Administration and Management

- Four-Log (99.99%) virus removal infrastructure construction was completed at 2A Water Treatment Facility to increase levels of disinfection. This facilitates applying for and receiving four-log treatment credit for Ground Water Rule compliance.
- 3A Re-pump facility was transitioned from gaseous chlorine to sodium hypochlorite.
- Master Lift Station 440 was put in service after a complete mechanical, electrical, and SCADA rehabilitation. The SCADA system was integrated into the existing system until the District 4 SCADA project is completed.

Water and Wastewater Engineering Division

Water and Wastewater Engineering Division (WWED) is committed to managing the WWS Capital Improvement Program (CIP) by ensuring that cost-effective, reliable infrastructure is available in a timely manner to meet the current and projected demands and capacities for raw water, potable water, sanitary sewer and storm drainage within WWS service areas.

WWED is responsible for developing and implementing the CIP for services provided by WWS including water, wastewater and drainage. The division is also responsible for coordination of developer-donated facilities, the maintenance of record information on potable water and wastewater facilities, administration of potable water and sewer easements, and administration of permits to connect to the potable water and wastewater plants operated by WWS. WWED also provides general potable water and wastewater engineering support for Broward County. These processes ensure compliance with the County's minimum standards for construction and integrity of WWS systems.

WWED manages the following projects:

- The Local Utility Program (LUP) covers an area of 1,479 acres and includes installation of approximately 54 miles of pipeline. Construction started in 2009. Each project is designed based on its Utility Analysis Zone (UAZ).
- North Regional Wastewater Treatment Plant (NRWWTP) effluent disposal and treatment enhancements to comply with outfall legislation and proposed facilities operational modifications are estimated at \$171 million over the next 5 years.
- WWS established a Guaranteed Energy Savings contract for the construction of the energy conservation measures (ECMs) for the agency's wastewater treatment facilities. The goal of this project is to reduce the carbon footprint through the implementation of the ECMs, thus resulting in reduced operational costs and improved environmental efficiencies. Construction was completed in August 2015.
- WWS has initiated design for a comprehensive restoration project for the NRWWTP. The project will address improvements to aging infrastructure and will be accomplished in several phases. The first phase of improvements are expected to begin construction in 2016. The estimated cost of this project is \$105 million.

Section 2 - Administration and Management

Water Management Division

Water Management Division (WMD) is committed to developing, managing, operating, and maintaining the surface and groundwater resources within our service area to provide recharge for water supply and wetlands; saltwater intrusion abatement; drainage and flood control; and environmental enhancements.

WMD programs in engineering, management and development review provide for the planning, design, construction and right-of-way management of waterways, culverts, pump stations and water control structures that provide flood protection, surface and ground water recharge, saltwater intrusion abatement and urban water supply. Water supply planning, well site assessments, and permitting services are provided to apply for, obtain and assure compliance with public water supply and diversion and impoundment water use permits.

WMD highlights included:

- Providing support to water supply and water resource development programs, including the Broward County Water Supply Plan Update, Broward County Comprehensive Plan Goals, Policies and Objectives and supporting document updates, C-51 Reservoir Project, Integrated Water Resources Management Master Plan, Broward County Water Resources Task Force/Technical Team and the Broward County Water Advisory Board/Technical Advisory Committee.
- Preparing annual Alternative Water Supply and conservation updates, Consumptive Use Permit modifications, and maintaining submittal of monthly Consumptive Use Permit compliance information.
- Collection, analyses and tracking of wellfield withdrawals and surface water pumpages, water levels and chloride concentration sampling information required under Consumptive Use Permits for District 1A, District 2A/ North Regional Wellfield (NRW), South Regional Wellfield (SRW) and the Northern Recharge System.
- Providing hydrogeological technical support to WWOD and WWED for water supply and wastewater disposal projects.
- Providing assistance in the development of models to evaluate the impacts of predicted sea level rise on the 2A wellfield, the potential benefit of the C-51 Storage Reservoir and the Floridan Aquifer System's potential as an Alternative Water Supply.

Business Operations Division

Business Operations Division (BOD) is committed to supporting all WWS divisions by providing exceptional customer service and timely and accurate billing services; supporting sound financial management; fiscal planning and rate development; and providing efficient and effective support services.

Section 2 - Administration and Management

BOD provides accounting services for all divisions of WWS to provide timely financial reporting, ensure compliance with federal and state laws, professional accounting standards and County policies and procedures. The division provides customer services including meter reading and meter repair, monthly billing and collection of revenues. The division operates a warehouse for materials and supplies used in the operation and maintenance of utility infrastructure. BOD coordinates materials management, purchasing and contract administration functions for all operational and administrative activities in WWS. In addition, the division performs grounds and building maintenance services for over 200 locations owned and operated by WWS throughout the County. The division also coordinates the budgeting activities of all divisions of WWS, supports the development of fiscal plans and rates, fees and charges for the services provided by WWS and publishes an award-winning WWS employee newsletter.

BOD highlights included:

- Continuing to implement the “Toilet Credit” Program for WWS water customers to replace old high flow toilets with WaterSense high efficiency low flow toilets. Under the program, each approved customer receives a \$100 credit (a maximum of \$200 per customer) to their water bill to support water conservation efforts.
- Enhancing communication systems and employee training at the WWS customer payment centers and call center.
- Preparing complete and accurate WWS financial statements using CAFR online.
- Working with Water and Wastewater Information Technology Division to upgrade the Utility Management Software “Energy.”

Water and Wastewater Information Technology Division

Water and Wastewater Information Technology Division (WWITD) is committed to providing WWS divisions with current industry standard technologies to efficiently and effectively automate business functions and to providing a high level of service support for those systems.

WWITD provides specialized automation services to the water and wastewater utility by acquiring, developing and maintaining the latest technology solutions on its proprietary utility and SCADA networks. WWITD is responsible for desktop, server and network support for the WWS segment of the County’s administrative network.

The WWITD Director also manages the safety and physical security programs for WWS staff and facilities, which have been designated critical infrastructure by Homeland Security.

WWITD highlights included:

Section 2 - Administration and Management

- IT Operations
 - Went live with mobile implementation of Maximo using an application called DataSplice. Here is how this is being utilized in different areas at WWS:
 - Operations Division: WWOD is using DataSplice to log labor and equipment time used on Preventive Maintenance (PM) work orders do follow up work orders, and can skip a PM work order if needed. They are using iPads with DataSplice installed for these tasks. The iPads work in an offline mode, so they do not need connectivity to internet or Maximo when they are entering data.
 - Water Management Division: WMD is using DataSplice to enter Corrective Maintenance (CM) work order data. They enter work order data on chemical usage, labor, and material data on DataSplice-enabled iPads.
 - Warehouse: Warehouse is using handheld scanner equipment with DataSplice installed. Using these scanners, they are now able to do issues/returns, fulfill Work Order reservations, receive Purchase Order lines, print labels, and most importantly do a physical count of available inventory. the scanners are able to scan bin labels from up to 25 feet away, which allows them to check the contents of bins on the warehouse's top shelves (25 feet up) from ground level.
 - 75 percent completion of SCADA separation from the WWS Utility Network was achieved.
- 25 percent completion of Utility Network Upgrade was achieved. Plans and Programs
 - Negotiated contract with MTS Software Solutions for the continuing support of the Fortis Document Management application through December 2017.
 - Upgraded the Utility Billing (Energy) hardware to a more robust and current infrastructure to keep the application viable until the Utility Billing Software application is upgraded.

Section 3 - Retail Water and Wastewater Utilities System

Section 3 Retail Water and Wastewater Utilities System

This section describes the water and wastewater retail system including the service area, results of the physical inspection and review of the renewal and replacement program.

3.1 General Description

The retail water system supplies potable water to retail customers in several sections of the County and to one significant bulk water user. Over the past ten years, the County's retail water system has grown from 56,236 customers (connections) to its present retail base of 56,591. . Broward County's total population is approximately 1.8 million. Of this amount, WWS's customer base represents a population of approximately 180,952. The City of Coconut Creek, a sale for resale customer, has approximately 55,240 residents. Including the City of Coconut Creek, the retail water system serves approximately 13 percent of Broward County's total population.

The retail wastewater customer base has grown from 38,559 customers (connections) to its present base of 49,643 customers in the past ten years, representing an increase of 29 percent. This number will continue to grow through the County's extension of sanitary sewers into currently un-sewered areas. Treatment, transmission and disposal management is provided by the County-operated North Regional Wastewater System (the "Regional Wastewater System" discussed in Section 4 and collectively with the retail wastewater system the "Wastewater System") and by the Southern Regional Wastewater System operated by the City of Hollywood. A summary of the Retail Water and Wastewater systems is presented in Table 3-1.

Notably, finished water production has decreased in recent years. This may be attributable to slowdown in population growth and the County's water conservation efforts, including year-round lawn irrigation restrictions. Water conservation became increasingly important following a series of droughts from 2007 through 2009.

Section 3 - Retail Water and Wastewater Utilities System

Table 1 Summary of Retail Water System and Retail Wastewater System

System Component	Units	Fiscal Year 2006	Fiscal Year 2015	Change	Percent Change
Water System					
Customer Base	Customers	56,236	56,591	355	0.63%
Water Service Area	Square Miles	41.18	41.00	-0.18	-0.44%
Water Lines	Miles	683.27	712.00	28.73	4.20%
Water Plant Capacity:					
Plant Capacity	MGD ¹	46.00	56.00	10.00	21.74%
Avg. Daily Production ²	MGD ¹	23.95	20.07	-3.88	-16.19%
Max. Daily Production ²	MGD ¹	30.74	24.49	-6.25	-20.34%
Purchased Water	MGD ¹	7.036	6.79	-0.25	-3.49%
Wastewater System					
Customer Base	Customers	38,559	49,643	11,084	28.75%
Wastewater Service Area	Square Miles	40.9	40.2	-0.7	-1.71%
<p>¹ MGD = Million Gallons Per Day.</p> <p>² Droughts which began in April 2007 have resulted in reduced water use due to demand management efforts comprising water conservation initiatives, including year round lawn irrigation restrictions. Reduced water translates to reduced billed wastewater.</p> <p>Source: Broward County Water and Wastewater Services</p>					

Service Area and Customer Base

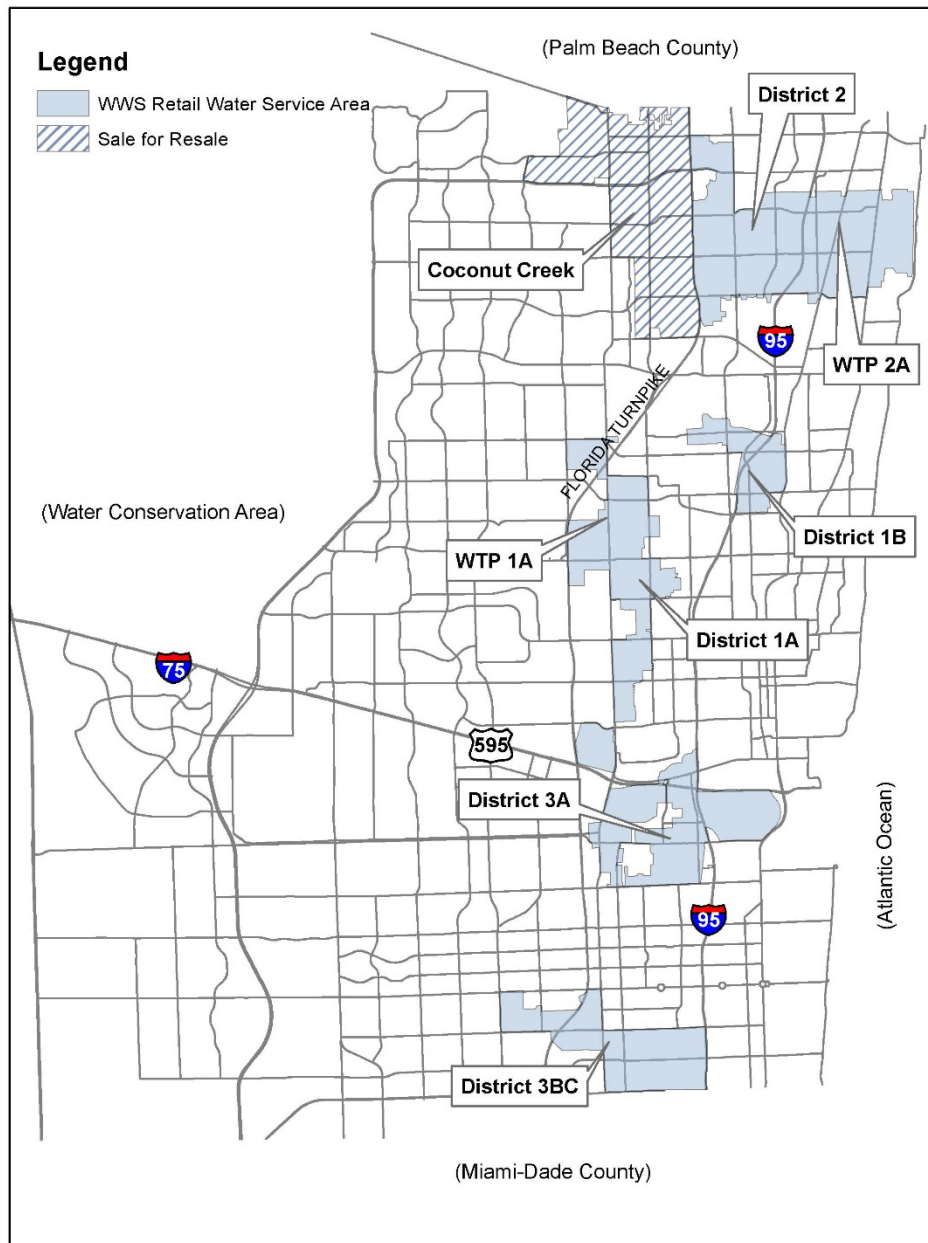
The retail water system is divided into three service areas - Districts 1, 2 and 3, which collectively cover approximately 41 square miles. Additionally, District 2 sells water to the City of Coconut Creek, which re-sells it to its customers. Two (2) Water Treatment Plants (WTPs), one each in District 1 and District 2, have a combined permitted water treatment capacity of 56 MGD (million gallons per day). However, potable water production is constrained by 20-year term consumptive use permits from the South Florida Water Management District (SFWMD). Based on the current 20-year permit, Biscayne Aquifer annual average allocation is 27.54 MGD through March 2028 and includes the North Regional Wellfield. Starting March 2013 a Floridan Aquifer allocation of 8.4 MGD average is included in the 20-year consumptive use permitted withdrawal. The Utility's five-year Capital Improvement Program (CIP) is predicated upon these

Section 3 - Retail Water and Wastewater Utilities System

allocations. Water for District 3 is provided by the City of Hollywood through a water for resale agreement.

The distribution systems in the three Districts contain approximately 712 miles of water distribution and transmission mains with 2-inch to 54-inch diameters. Figure 3-1 shows the geographic location of each service district as well as the large user (the City of Coconut Creek). Table 3-2 summarizes information on the production wells, treatment plants and water system storage capacity in each district.

Figure 3-1 WWS Retail Water Service Areas



Section 3 - Retail Water and Wastewater Utilities System

Table 2 Summary of Water System Facilities and Capabilities as of September 30, 2015

	District 1	District 2	District 3	Total
Production Wells	9	7	0	16
Wellfield Firm Capacity, (MGD) ^{1,2}	19.6	21.3	0	40.9
Treatment Plants ³	1	1	0	2
Permitted Plant Capacity (MGD) ^{2,4}	16	40	0	56
Current Permitted Allocation (MGD) ^{2,4}	10.04	17.5 ⁵	0	27.54
Storage Capacity (Million Gallons) ³	6.2	8.5	6	20.7
Distribution Mains (Miles)	246.0	248.8	217.1	712
Service Area (Square Miles)	11.9	14.8	14.3	41.0
Purchased Water (MGD) ²	0	0	6.79	6.79
Produced Water (MGD) ²	7.504	12.569	0	20.073

1 Firm Capacity refers to the available flow with the largest well in each district out of service.
2 MGD = Million Gallons Per Day
3 Includes clearwells, on site and distribution storage facilities.
4 Permit allocations are less than permitted treatment plant capacity.
5 Combined permit with North Regional Wellfield and includes finished water sold to Coconut Creek.

Source: Broward County Water & Wastewater Services

The Water System supplies water primarily to retail customers, but also serves the City of Coconut Creek under a resale agreement, which expires as described in Section 3.5. Without prior approval by the County, the City of Coconut Creek is prohibited from buying or otherwise providing water within its service area from any source other than the County during the term of the resale agreement, and cannot provide more than 100,000 gallons per day of water to any customer unless approved by the County. Presently, there appears to be no practical or economic incentive for the City of Coconut Creek to pursue development of its own facility or to develop alternative sources of supply. The County cannot charge rates to Coconut Creek greater than those charged to other customers in the same class. Billing based upon water meter readings is provided monthly.

A summary of historical treated water sold and consumption data, including service to the City of Coconut Creek, is shown in Table 3-3. Values for annual average daily consumption will differ from the sum of production plus purchased water due to system losses.

Section 3 - Retail Water and Wastewater Utilities System

Table 3-3 Summary of Treated Water Sold as of September 30, 2015

Fiscal Year	Average Number of Units¹	Average Number of Metered Customers	Total Billed Treated Water (1,000 GAL)	Total Billed Water for Resale (1,000 GAL)²	Annual Average Daily Consumption (MGD)
2006	83,725	52,938	10,362,713	2,005,205	28.39
2007 ^{3,4}	87,539	55,596	9,725,151	1,958,720	26.64
2008 ^{3,4}	89,452	57,003	9,063,644	1,868,562	24.83
2009 ^{3,4}	92,870	58,287	9,001,466	1,872,821	24.66
2010 ^{3,4}	93,183	58,323	8,628,876	1,754,856	23.64
2011 ^{3,4}	92,208	58,773	8,616,736	1,731,297	23.61
2012 ³	88,344	56,503	8,339,560	1,643,812	22.85
2013 ³	87,928	56,529	8,279,722	1,699,799	22.67
2014 ³	88,305	56,538	8,449,062	1,754,927	23.15
2015 ³	89,066	56,591	8,738,889	1,789,374	23.94

1 The term "unit" means individual living unit for residential (single family), multifamily, hotel/motel and mobile home categories. Several units may be served through one connection. For commercial, the term means the number of connections.

2 Included in the total water billed; most represents service to the City of Coconut Creek.

3 Droughts which began in April 2007 have resulted in reduced water use due to demand management efforts comprising water conservation initiatives, including year round lawn irrigation restrictions. Reduced water use translates to reduced billed wastewater.

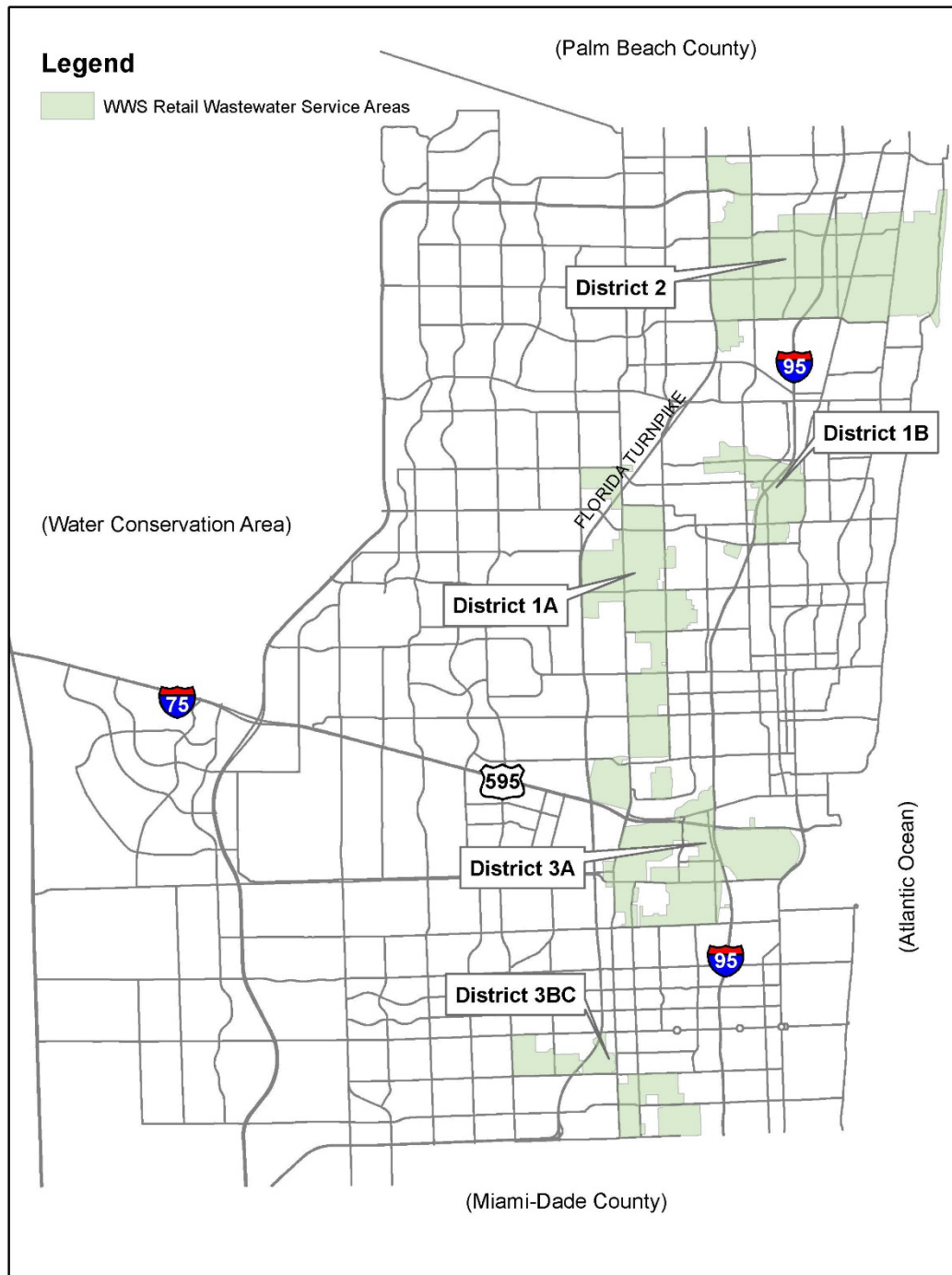
4 Included in Average Number of Metered Customers are sewer only customers.

Source: Broward County Water and Wastewater Services

The retail wastewater system service area covers approximately 40 square miles with approximately 440 miles of gravity sewers, 232 lift stations, 8 retail master pump stations and 111 miles of force mains. Figure 3-2 shows the service districts for the retail wastewater system. Table 3-4 presents retail wastewater system characteristics. A 10-year summary of the Retail Wastewater System customers and billed wastewater flows is presented in Table 3-5. Table 3-6 presents a five-year history of water usage by customer type.

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Figure 3-2 WWS Retail Wastewater Service Areas



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**Table 3-4 Retail Wastewater System Characteristics
as of September 30, 2015**

	District 1	District 2	District 3	Total
Service Area (Square Miles)	12.9	15.5	11.8	40.2
Gravity Sewer (Miles)	186.5	168.1	85.5	440.1
Lift Stations	75	95	62	232
Force Mains (Miles)	43.1	34.9	33.4	111.4
Retail Master Pump Stations	0	5	3	8

**Table 3-5 Summary of Billed Wastewater - Retail
as of September 30, 2015**

Fiscal Year	Average Number of Units ¹	Average Number of Metered Customers	Total Billed Treated Wastewater ² (1,000 GAL)	Annual Average Daily Flow (MGD)
2006	67,736	40,021	5,077,759	13.91
2007	70,361	41,297	4,915,383 ²	13.47
2008	71,718	42,163	4,830,155 ²	13.23
2009	74,146	43,591	4,828,210 ²	13.23
2010	74,547	44,953	4,744,985 ²	13.00
2011	74,691	44,856	4,891,742 ²	13.40
2012	77,247	46,911	4,872,721 ²	13.35
2013	78,020	47,799	4,996,843 ²	13.69
2014	79,466	48,873	5,165,058 ²	14.15
2015	80,995	49,643	5,372,243 ²	14.72

1 The term "unit" means individual living unit for residential (single family), multifamily, Hotel / Motel, and mobile home categories. Several units may be served through one connection. For commercial, the term means the number of connections and does not include large users

2 Billed wastewater is primarily based upon water sold.

Source: Broward County Water and Wastewater Services

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**Table 3-6 Water Usage - Five Year History (1,000 gallons)
Through September 2015**

Customer Class	Fiscal Year 2011	Fiscal Year 2012	Fiscal Year 2013	Fiscal Year 2014	Fiscal Year 2015
Residential	4,659,677	4,534,199	4,462,407	4,463,289	4,587,014
Commercial	1,785,623	1,756,142	1,740,148	1,868,525	1,961,350
Irrigation	440,139	405,407	377,368	362,321	401,151
Sale For Resale	1,731,297	1,643,812	1,699,799	1,754,927	1,789,374
Total¹	8,616,736	8,339,560	8,279,722	8,449,062	8,738,889
<i>1 Droughts which began in April 2007 have resulted in reduced water use due to demand management efforts comprising water conservation initiatives, including year round lawn irrigation restrictions. Reduced water use translates to reduced billed wastewater.</i>					
<i>Source: Broward County Water and Wastewater Services</i>					

3.2 Water System Regulatory Requirements

Current Water Quality Regulations

The Safe Drinking Water Act (SDWA, 1974) and the Safe Drinking Water Act Amendments (SDWAA, 1986) authorized the United States Environmental Protection Agency (EPA) to establish national primary and secondary drinking water regulations to regulate maximum permissible levels of contaminants in finished drinking water. These standards were incorporated into the State of Florida Water Quality Regulations beginning in 1993 and modified to address state-specific concerns. By doing this and meeting other specific requirements, the State was given the primary authority (primacy) to enforce SDWA requirements within its borders. The Florida Department of Environmental Protection (FDEP) is the state agency with primary enforcement responsibility. In Broward County, the authority to enforce drinking water regulations is delegated by FDEP to the Broward County Health Department, which is an Approved County Health Department (ACHD) as defined under the Memorandum of Understanding between FDEP and the Florida Department of Health.

The Water and Wastewater Operations Division (WWOD) performs the analyses for primary and secondary drinking water standards on raw and finished water as required under applicable sections of the SDWA and the State of Florida's Water Quality Regulations (Chapter 62-550, Florida Administrative Code (FAC)). No maximum contaminant levels (MCLs) were exceeded, no Treatment Technique (TT) violations were noted, and no Action Levels were exceeded during FY 2015. Additionally, samples required under the Unregulated Contaminant Monitoring Rule (UCMR) were analyzed and reported in FY 2015. WWS tests raw water quality only for the development of baseline data and as required under the Ground Water Rule as described below; MCL limitations do not apply for any raw water monitoring outside of fecal indicator triggered monitoring required under the ground water rule. The annual Consumer Confidence

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Report, which summarizes the results of drinking water quality testing results, is available at <http://www.broward.org/WaterServices/WaterQualityReport>

The Disinfectant/Disinfection By-Products Rule (D/DBP) requires all water treatment plants to comply with MCLs for byproducts of a number of common disinfectants. For WWS water treatment plants, byproducts of chlorine and chloramines, specifically total trihalomethanes (TTHMs) and five haloacetic acids (HAA5), are of primary concern. Stage II of this rule requires that the rolling annual average of TTHM and HAA5 levels be below their respective MCLs at each sampling site in the distribution system, whereas previously they were averaged over the entire system. Since Stage II compliance began in February 2012, WWS' water treatment plants have remained in compliance with D/DBPR requirements.

The Ground Water Rule was promulgated in 2009. This rule, which was adopted by reference in FAC 62-550.828 in December 2011, provides two Compliance options: triggered monitoring and 4-log virus treatment. Triggered monitoring uses sampling under the existing Total Coliform Rule (TCR) to trigger additional sampling requirements for raw water wells if needed. If any of the wells test positive for one of three fecal indicators, action must be taken, which typically includes issuing a precautionary boil water order for the affected system. Groundwater plants that provide 4-log (99.99%) virus treatment are not required to conduct triggered monitoring, but instead must maintain treatment conditions specified in its 4-log treatment authorization.

Currently, the County is in the process of implementing 4-log virus treatment in its 3A system. Improvements at the 1A WTP are complete, and 4-log treatment is currently in operation in the 1A system. Improvements at the 2A water treatment facility are complete and 4-log review and approval by the BCHD was received in 2015, and improvements at the 3A facility are in the design phase. In FY 2015, WWOD maintained continuous compliance with the Ground Water Rule.

The EPA promulgated the revised Total Coliform Rule (RTCR) rule on February 13, 2013 and minor revisions on February 26, 2015. Florida adopted the RTCR by reference under F.A.C. 62-550.830 on July 7, 2015. Florida currently has primacy for the revised rule, except for certain sections that cover systems serving less than or equal to 1,000 people. The RTCR is different from the old TCR in the following major ways:

- Systems were required to submit a formal sample siting plan (sample collection schedule and all sample sites, including sites for routine and repeat monitoring) by March 31, 2016 and start sampling per the plan starting on April 1, 2016.
- Total coliforms no longer trigger a violation, only *E. coli*. Acute violation of the MCL for *E. coli* includes:
 - If the system has an *E. coli*-positive repeat sample following a total coliform-positive routine sample.
 - If the system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

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- If the system fails to take all required repeat samples following an *E. coli*-positive routine sample.
- If the system fails to test for *E. coli* when any repeat sample tests positive for total coliform.
- Assessment and corrective action required based on monitoring results.
- Exceedance of the 5 percent total coliform threshold results in one of the following:
 - Utility must conduct Level 1 assessment if this is the first exceedance of the 5 percent total coliform threshold in the last 12 months. It is a basic examination of the source water, treatment, distribution system and relevant operational practices.
 - The State or another outside agency must conduct a Level 2 assessment if there is more than one Level 1 assessment triggered in a 12-month period, *E. coli* is detected, or certain monitoring violations occur. Level 2 assessments are more in-depth versions of Level 1 assessments.
 - Failure to assess and correct identified deficiencies is a Treatment Technique (TT) violation.
- Public notification is required for failure to assess/correct and or acute *E. coli* violations.

Monitoring results for seven currently-unregulated contaminants are included in the 2015 water quality report. The EPA requires utilities to periodically collect occurrence and concentration data of substances that are being considered for future regulation under the Unregulated Contaminant Monitoring Rule. Outside of time and resources required for analysis, these detections have no immediate compliance impact on WWS; however, it is recommended that WWS closely follow any future potential regulatory action for contaminants detected under the UCMR.

On May 5, 2014, updated cross-connection control rules under FAC 62-555.330, 62-555.360, and FAC 62-555.900 came into effect. These rules allow a dual check valve to be used in lieu of a reduced pressure principle-type backflow preventer (RPZ) at residences where an auxiliary (reclaimed or other) water source is present, reduce the required testing frequency for RPZs installed at residences from once a year to once every two years, and requires utilities to report cross-connection control compliance on a new two-page form. Going forward, WWS/BOD will be required to prepare and submit this form each year.

3.3 Water Supply

The primary source of water supply for WWS is the Biscayne Aquifer. Presently, WWS operates wellfields to supply water to the 1A and 2A Water Treatment Plants, with firm capacities of 19.6

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and 21.3 MGD, respectively. Additional water is provided to District 2 by the North Regional Wellfield with a firm capacity of 18.1 MGD. A physical description of the regional system and its wellfields is provided in Section 5. Water for District 3 is provided by the City of Hollywood.

In 1979, the Biscayne Aquifer was designated as a “sole source” drinking water supply by the EPA. The water in the aquifer is primarily replenished by rainfall, but is also recharged by water flowing from Lake Okeechobee and conservation areas through an extensive water conveyance system. Presently, in addition to the Utility, the Biscayne Aquifer is also the primary source for raw water supplies for the municipalities in Broward County, Miami-Dade County, Monroe County, and the southern portion of Palm Beach County.

Section 3.2 of the Source Specific Criteria of the South Florida Water Management District (SFWMD) Applicant’s Handbook for Water Use Permit Applications limits raw water usage from the Biscayne Aquifer for public water supply to the maximum quantity of water withdrawn over a consecutive 12-month period during the five years preceding April 1, 2006. Water supplies necessary to satisfy any demand which exceeds the maximum allowable withdrawal must come from an alternative water supply source, such as the Upper Floridan Aquifer, harvested stormwater or reclaimed wastewater to offset withdrawal impacts to the Everglades Water Bodies.

Due to the “withdrawal and treatment” cost-effectiveness of the relatively shallow Biscayne Aquifer, this aquifer is and is expected to remain the County’s primary source of raw water supply. Future water supply beyond what can be provided from the Biscayne Aquifer is available from the brackish Upper Floridan Aquifer. The County CIP for the Utility includes provisions to construct reverse osmosis facilities to desalinate water from the Upper Floridan Aquifer to meet projected future potable water demands. The County, Palm Beach County, several municipalities, and the SFWMD are also evaluating the economic and environmental benefit of a regional water storage reservoir project located in Palm Beach County known as the C-51 Reservoir Project. This project could potentially expand the availability of Biscayne Aquifer raw water by offsetting impacts to the Everglades Water Bodies. Should the C-51 Reservoir prove to be a reliable, lower cost alternative water supply option, the County would make use of the water made available by the C-51 Reservoir Project first before development of the brackish Upper Floridan Aquifer water source.

The Broward County Board of County Commissioners approved Resolution No. 2015-195 on April 7, 2015 supporting the C-51 Reservoir Project and encouraging water utilities to consider participating in the project in order to receive long-term raw water permit allocations from the South Florida Water Management District. The proposed C-51 Reservoir in western Palm Beach County has the potential to deliver a significant amount of water for future public water supply in Broward and Palm Beach Counties. Phase 1 of this project is projected to supply up to 35 MGD of water to the regional water supply system, and phase 2 is projected to supply up to 96 MGD. These projections are subject to change as the C-51 project continues to develop.

3.4 Water Supply Regulatory Requirements

The volume of raw water withdrawal from the Utility’s wellfields is regulated by the SFWMD. Each wellfield is governed by a Consumptive Use permit that stipulates the annual and monthly withdrawals that are allocated to each wellfield. As stated above, the 2007 Regional Water

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Availability Rule requirements limit withdrawals from the Biscayne aquifer to the highest consecutive 12-month period in the five years prior to April 2006. Water demand above the Biscayne limitation will need to be supplied by an Alternative Water Source. The County has accounted for the uncertainty that this rule represents in the water supply planning process by pursuing various Alternative Water Supply options such as the treatment of brackish upper Floridan Aquifer water, regional water availability offsets from C-51 water storage, use of reclaimed water to offset potable water irrigation uses, and encouragement of system-wide water conservation.

The potential need to develop an alternative water source will have implications for future treatment technologies, capital investments, and operation and maintenance costs. The Utility will evaluate the fiscal and environmental factors associated with each potential alternative supply source and will make timely decisions concerning water source and treatment development.

The County's Utility is permitted by the SFWMD to withdraw approximately 15.2 billion gallons of groundwater from their combined wellfields, including the Regional Raw Water Wellfields. The Utility holds three permits from the SFWMD for the wellfields 1A, 2A/North Regional Wellfield (NRW), and the South Regional Wellfield (SRW). The permit for the combined 2A/NRW wellfields was issued for a 20-year duration in March 2008 and the permit for the District 1A wellfield was issued for a 20-year permit duration in April 2008.

An application to renew the SRW permit was submitted in October 2007 prior to permit expiration. The County and the SFWMD are actively reviewing available information and the permit has been administratively extended while the review process continues. The SRW permit governs the withdrawal of raw water from the Biscayne aquifer for sale to four coastal raw water large users (Dania Beach, FPL, Hallandale Beach, and Hollywood) and the permit allocation is based on the projection of raw water demands by those large users. By the end of 2013, the SFWMD had issued Consumptive Use Permits to Dania Beach and Hallandale Beach. Hollywood's Consumptive Use permit was issued in 2010. Raw water demand projections from individual large users will provide the basis for the SRW permit renewal. The County is actively working with the SFWMD and wellfield Large Users to complete the renewal effort.

Monitoring of wellfield and individual well withdrawals, groundwater levels, and chloride concentrations are required as part of the consumptive use permits issued for each wellfield. Monitoring information is reported to the SFWMD in their ePermitting system monthly to ensure each permit remains compliant.

Table 3-7 below summarizes the Consumptive Use Permit allocations for each of the County Utility wellfields.

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Table 3-7 Summary of SFWMD Wellfield Permits as of September 30, 2015

Description	Wellfield		
	1A	2A/NRW	SRW
Permit Period:			
Issuance	4/10/2008	3/13/2008	10/10/2002
Expiration	4/10/2028	3/13/2028	10/10/2007 ¹
Total Allocations:			
Annual Average Daily (MGD)	13.9	22.1	14.2
Maximum Monthly (MGD)	15.2	24.3	-
Maximum Day (MG)	-	-	22.4
BISCAYNE AQUIFER WITHDRAWALS			
Annual Average Daily (MGD)	10.0	17.5	1
Maximum Monthly (MGD)	10.9	19.2	1
FLORIDAN AQUIFER WELLS			
Annual Average Daily (MGD)	3.9	4.6	1
Maximum Monthly (MGD)	4.2	5	1
Number of Wells – proposed	4 ²	4	-
Diameter (Inches)	16	16	-
Depth (Feet)	1,200	1,200	-
Proposed Implementation Date Modification ³	2019	2022	-
<p><i>1. Permit for SRW expired October 2007 and an application is under review with the SFWMD. It is expected that the SRW permit will be renewed in the ordinary course of events.</i></p> <p><i>2 Construction of two test wells was completed in 2014.</i></p> <p><i>3. Due to demand management efforts and lower growth, the implementation dates for alternative water supply were extended.</i></p> <p><i>Source: Broward County Water and Wastewater Services</i></p>			

Long-term water supply in South Florida may also be affected by the Comprehensive Everglades Restoration Plan (CERP) undertaken by the U. S. Army Corps of Engineers (ACOE) in coordination with the SFWMD and by regional water supply planning undertaken by the SFWMD and the FDEP. The intent of CERP was to provide multiple benefits to the South Florida ecosystem. While restoration of the Everglades is a primary objective of the plan, it also includes a provision for ensuring a reliable, adequate supply of fresh water for use by the environment, public water supply and agriculture while maintaining flood protection. The effect of CERP will be to reserve water resources for restoration of the Everglades without impacting existing legal users. Implementation through the Lower East Coast Water Supply Plan (LECWSP), and CERP account for future needs of water utilities by utilization of new surface water reservoirs and by implementation of Aquifer Storage and Recovery (ASR) wells. A decision by the State to endeavor to acquire the property owned and farmed by US Sugar as

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part of the CERP may limit the option of utilities to store and use excess stormwater as an alternative to water supply.

It is possible that the new water supply technologies could be delayed, or could be less effective than SFWMD and ACOE expect. Recognizing this, the Utility has taken multiple steps to assure that a continuous adequate raw water supply is available:

- The County is actively participating in the LECWSP, the CERP and the SFWMD regulatory revision process.
- A new surface water pump station has been designed to improve the effectiveness of the existing raw water recharged by three existing pump stations through the canal system.
- The County has constructed and operates a 10 MGD wastewater reuse facility to support potable water demand reduction.
- The County continues to implement the Integrated Water Resources Plan (IWRP) in order to maximize the utilization of available water. Current projects include the design of interconnects between the C-1 and C-2 Canals.
- The County continues to review potential use of the upper Floridan Aquifer as an alternative raw water supply source.
- The County continues to be engaged with the SFWMD and Palm Beach Aggregates to develop the C-51 Storage Reservoir Project as a potential water source to offset Regional Water impacts.
- The County continues to promote water conservation within the utility service areas and county-wide.

3.5 Overview of the Water System Facilities

District 1

District 1 has a combined service area of 11.9 square miles, FDEP permitted treatment plant capacity of 16 MGD, and 246 miles of water distribution and transmission mains. WWS maintains District 1 water system interconnections with the City of Fort Lauderdale, the City of Tamarac, the City of Plantation, and the City of Lauderhill to provide for emergency water supply.

District 2

District 2 includes the Utility's largest wholesale water customer, the City of Coconut Creek. The District, not including the City of Coconut Creek, has a service area of 14.8 square miles, a FDEP permitted treatment plant capacity of 40 MGD and contains 249 miles of water distribution and transmission mains. The facilities of District 2 are interconnected with the City of Deerfield Beach, the Town of Hillsboro Beach, the City of Pompano Beach and Palm Beach County to provide for emergency water supply.

The County has an agreement with the City of Coconut Creek under which the County has agreed to provide the City of Coconut Creek with potable water for a term that exceeds by one year the last payment of any potable water system debt obligation of the County. The City of Coconut Creek constitutes approximately 20% of the total potable water consumption by customers of the Utility, and pays compensation amounting to 4.7% of the Utility's gross revenues. The agreement provides that, except by written consent of the County or for emergency purposes, the City of Coconut Creek will not purchase water other than from the County or pump water into its water distribution system from its own facilities. The County has agreed not to sell water to anyone else within the defined service area and the City of Coconut Creek is not permitted to increase its water service area without the written consent of the County.

District 3

District 3 is the southernmost service area of the County and is geographically separated into subdistricts referred to as 3A and 3BC. 3A and 3BC receive potable water through connections principally with the City of Hollywood. District 3 has a combined service area of approximately 14.3 square miles and contains 217 miles of transmission and distribution mains. Subdistrict 3A has interconnects with the City of Fort Lauderdale, the City of Hollywood and the City of Dania Beach to provide for emergency water supply. Subdistrict 3BC has interconnects with the City of Hollywood for its primary water supply, and the Cities of Pembroke Pines and Miramar to provide for emergency water supply.

3.6 Overview of the Retail Wastewater System Facilities

District 1

District 1 has a service area of 12.9 square miles and includes 186.5 miles of gravity collection sewers and 75 lift stations. There are 43.1 miles of force mains. Transmission, treatment and disposal of wastewater are provided through the Utility's Regional Wastewater System.

District 2

The size of the District 2 service area is 15.5 square miles. The collection system consists of 168.1 miles of gravity sewer, 95 lift stations, 5 retail master pump stations, and 34.9 miles of force mains. Transmission, treatment and disposal of wastewater are provided through the Utility's Regional Wastewater System.

District 3

District 3 serves an area of 11.8 square miles. The gravity collection system has 85.5 miles of gravity sewer, 62 lift stations and 3 retail master pump station. The force main network contains 33.4 miles of pipe that delivers the wastewater from this area to the Southern Regional Wastewater Treatment Facility operated by the City of Hollywood. District 3A and District 3BC wastewater is treated by the City of Hollywood under a large user wastewater agreement with the County. The County has 5.883 MGD of reserved capacity in the Southern Regional Wastewater Treatment Plant. The City of Hollywood has 55.5 MGD of plant capacity. One (1) of the master pump stations is located within District 3.

The agreement between the County and the City of Hollywood contains a number of major provisions including: identification of the service area; requirements for the use of metering devices; reserve capacity requirements; restrictions on excessive flows; and charges for damages to the system. Debt service and operation and maintenance costs are paid on an actual flow basis. The agreement can be terminated by either party with a 365-day notice, if all financial requirements have been met. The City of Hollywood may not terminate the agreement, unless there shall be a readily available alternative means of treating and disposing of County wastewater.

3.7 Visual Inspection and Review

The visual inspection of the District 1 water treatment plant was performed on April 22, 2016. The District 2 water treatment plant was inspected on April 26, 2016. The District 3 water treatment plant (currently operated as a pumping station and booster chlorination facility), as well as distribution system storage and pumping stations 3B and 3C (part of the 3BC system), were inspected on April 27, 2016. These inspections were performed by Brown and Caldwell accompanied by WWS staff.

Water Treatment Plant 1A

WTP 1A was originally constructed in 1960 with a treatment capacity of 3.0 MGD, which was expanded to 10.5 MGD in 1979, and finally to 16.0 MGD in 1994. Overall, the plant is in good condition. Water quality standards were maintained at WTP 1A throughout the year. During the visual inspection of the plant, it was generally operating in a satisfactory manner. The plant is clean and well maintained. The following summarizes the observations resulting from the inspection:

- Raw Water Wells
 - Well 1 was down for maintenance. The wellhead and associated piping and valves appeared to be in good condition. Light corrosion was noted around the pump shaft. Electrical equipment was in good condition. The concrete slab was in good condition.
 - Well 2 was generally in good condition. The wellhead and associated piping and valves appeared to be in good condition. Light corrosion was noted around the pump shaft and piping. Electrical equipment was in good condition. The concrete slab was in good condition.
 - Well 3 was generally in good condition. The wellhead and associated piping and valves appeared to be in good condition. Light corrosion was noted around the pump shaft and piping. Electrical equipment was in good condition. The concrete slab was in good condition.
 - Well 4 was generally in good condition. The wellhead and associated piping and valves appeared to be in good condition. Light corrosion was noted around the pump shaft. Electrical equipment was in good condition. The concrete slab was in good condition.
 - Well 5 was generally in good condition. The wellhead and associated piping and valves appeared to be in good condition. Light corrosion was noted around the pump shaft and piping. Electrical equipment was in excellent condition. The concrete slab was in good condition.

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- Well 6 was generally in good condition. The wellhead and associated piping and valves appeared to be in good condition. Light corrosion was noted around the pump shaft and piping. Electrical equipment was in good condition. The concrete slab was in good condition.
- Well 7 was generally in good condition. The wellhead and associated piping and valves appeared to be in good condition. Light corrosion was noted around the pump shaft. Electrical equipment was in good condition. The concrete slab was in good condition.
- Well 8 was generally in good condition. The wellhead and associated piping and valves appeared to be in good condition. Light corrosion was noted around the pump shaft and piping. Electrical equipment was in good condition. The concrete slab was in good condition.
- Well 9 was generally in good condition. The wellhead and associated piping and valves appeared to be in good condition. Light corrosion was noted around the pump shaft and piping. Electrical equipment was in good condition. The concrete slab was in good condition. The building enclosure is in need of preventative maintenance and repair.
- Deep Well 1 is a new Floridan well that is still in the development and testing phase. Permanent wellhead equipment was not in place at the time of the inspection.
- Deep Well 2 is a new Floridan well that is still in the development and testing phase. Permanent wellhead equipment was not in place at the time of the inspection.
- Treatment Unit 1 (softener unit) was recently refurbished and was down for maintenance at the time of site visit. The interior, including the cone, mixer, and launders, were in good condition. The drive was removed from the unit and is currently being rebuilt. Electrical equipment and instruments appeared to be in good condition. Auxiliary pumps and associated piping, valves, and equipment were generally in good condition.
- Treatment Unit 2 is generally in good condition. The interior, including the visible parts of the cone and mixer were in good condition. Effluent launders showed moderate corrosion in several locations – this should be addressed via sanding and repainting. The drive appeared to be in fair condition. Electrical equipment and instruments appeared to be in good condition. Auxiliary pumps and associated piping, valves, and equipment were generally in good condition.

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- Filters
 - Filter 1 was generally in very good condition. Filter media appeared level and uniform. Piping and valves were in very good condition. Effluent launders were in very good condition. The control panel on the filter deck appeared to be in good condition. The overall structure appeared to be in very good condition.
 - Filter 2 was generally in very good condition. Filter media appeared level and uniform. Piping and valves were in very good condition. Effluent launders were in very good condition. The control panel on the filter deck appeared to be in good condition. The overall structure appeared to be in very good condition.
 - Filter 3 was generally in very good condition. Filter media appeared level and uniform. Piping and valves were in very good condition. Effluent launders were in very good condition. The control panel on the filter deck appeared to be in good condition. The overall structure appeared to be in very good condition.
 - Filter 4 was generally in very good condition. Filter media appeared level and uniform. Piping and valves were in very good condition. Effluent launders were in very good condition. The control panel on the filter deck appeared to be in good condition. The overall structure appeared to be in very good condition.
 - Filter 5 was generally in very good condition. Filter media appeared level and uniform. Piping and were in very good condition. Effluent launders were in very good condition. The control panel on the filter deck appeared to be in good condition. The overall structure appeared to be in very good condition.
 - Filter 6 was generally in very good condition. Filter media appeared level and uniform. Piping and valves were in very good condition. Effluent launders were in very good condition. The control panel on the filter deck appeared to be in good condition. The overall structure appeared to be in very good condition.
 - Filter 7 was generally in very good condition. Filter media appeared level and uniform. Piping and valves were in very good condition. Effluent launders were in very good condition. The control panel on the filter deck appeared to be in good condition. The overall structure appeared to be in very good condition.
 - Filter 8 was generally in very good condition. Filter media appeared level and uniform. Piping and were in excellent condition. Effluent launders were in very good condition. The control panel on the filter deck appeared to be in good condition. The overall structure appeared to be in very good condition.

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- The filter backwash pumps, piping, valves, gauges, and appurtenances appeared to be in good condition. Corrosion was observed on the baseplate of both backwash pumps that should be addressed during routine maintenance.
- Clearwell transfer pumps (4) were recently installed as part of the 4-log project at this facility, and all pumps, piping, valves, gauges, appurtenances, and associated structures appear to be in excellent condition.
- High Service Pumping
 - High service pumps 1, 3, and 5 appeared to be in very good condition. Pumps, piping, valves, gauges, appurtenances, and associated structures appear to be in very good condition.
 - High service pumps 2, 4, and 6 appeared to be in good condition. Pumps, piping, valves, gauges, appurtenances, and associated structures appear to be in good condition. High service pump electrical gear generally appeared to be in good condition.
- Solids handling
 - The gravity thickener structure and auxiliary pumps appeared to be in good condition.
 - The emergency gravity thickener structure, rake and drive, and auxiliary pumps appeared to be in good condition. This structure is currently only put in service on an as-needed basis.
 - Vacuum belt thickeners and associated vacuum pumps and electrical equipment generally appeared to be in good condition.
- Chemical feed and storage systems
 - The carbon dioxide feed system, including refrigerated storage tanks and solution feeder panels, appeared to be in excellent condition. These systems were recently installed as part of the 4-log project.
 - The ferric chloride feed and storage system was in fair to good condition. Bulk and day storage tanks appeared generally intact and functional. Metering pumps appeared to be functional. Calibration columns were open at the top, below the level of the day tanks. This represents a potential spill hazard. Consistent with current practices, each calibration column should be capped with a vent pipe routed to above the liquid level of the day tanks.

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- The dry polymer makedown and feed systems were in good condition. Makedown and dilution units appeared generally intact and functional. Metering pumps appeared to be functional. Calibration columns were open at the top, but appeared to be at or above the level of the tanks from which they are filled. It is recommended that these be screened or covered to prevent foreign objects from entering the system.
- The lime slaking and feed systems appeared to be in generally good condition. The lime silo, vibrator, rotary valve, and dosing unit appeared to be in good condition. Slakers appeared to be functional. Overall, the level of corrosion on equipment was less than expected and equipment appears to be well-maintained.
- The fluoride (HFS) feed and storage system was in fair condition. Bulk and day storage tanks appeared generally intact and functional. Metering pumps appeared to be functional. Calibration columns were open at the top, below the level of the day tanks. This represents a potential spill hazard. Consistent with current practices, each calibration column should be capped with a vent pipe routed to above the liquid level of the day tanks. Electrical and mechanical equipment was extensively corroded inside the day tank/metering room. This system should be considered for refurbishment.
- The sodium hypochlorite feed and storage system, which was recently installed, was in very good condition. Storage tanks are generally in very good condition. Containment area flooring is generally in good condition. Metering pumps are in very good condition. Metering pump piping is in good condition.
- The sodium hydroxide system is not in service, and is not anticipated to be put in service within the foreseeable future. The bulk tank shares a containment area with ferric chloride and fluoride. Since sodium hydroxide can react violently with both of these chemicals, consideration should be given to permanently removing this tank.
- The gaseous ammonia system is generally in good condition. Bulk storage tanks are in very good condition. Ammoniators are in good condition.
- The diesel fuel storage system is generally in good condition. Bulk storage tanks are in very good condition.
- Backup generators and associated equipment appeared to be in good condition.

Plant modifications performed through FY 2015:

- Structural repairs to Treatment Unit No. 1 (complete).

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- Receipt of 4-Log Virus Treatment final certification (complete).
- Construction of a new 1.0 MG concrete storage tank (ongoing).
- Improvement of site lighting (complete)
- Completion of new communication tower (complete)
- Rebuilding of filters No. 5 thru No. 8 and replace piping and media (complete)
- Drilling of second Floridan well (complete)

The plant modifications to be initiated for FY 2016:

- Construction of new 1.0 MG water storage tank (ongoing)
- Design of new electrical switchgear (ongoing)

Water Treatment Plant 2A

The WTP 2A was originally constructed in 1975 with a treatment capacity of 20 MGD. In FY 1994, the treatment capacity was expanded to 40 MGD with permitted capacity of 40 MGD. Water quality standards were maintained at WTP 2A throughout the year. Overall, the plant is in good condition and appeared to be operating satisfactorily at the time of the site visit.

A summary of the inspection observation for major subsystems is presented below:

- Raw Water Wells
 - Well 4 was in fair condition. The security fencing was intact. The wellhead and associated pump shaft, piping and valves appeared to be in fair condition. Electrical equipment was in fair condition. The concrete slab was in good condition.
 - Well 6 was in fair condition. The well building was intact and generally in fair condition. The wellhead and associated pump shaft, piping and valves appeared to be in fair condition. Electrical equipment was in fair condition. The building enclosure was in fair condition.
 - Well 7 was recently rehabilitated. The security fencing was intact and generally in good condition. The wellhead and associated pump shaft, piping and valves appeared to be in very good condition. Electrical equipment was in good condition. The concrete slab was in good condition.

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- Well 8 was recently rehabilitated and was generally in excellent condition. The security fencing was intact. The wellhead and associated motor, pump shaft, piping and valves appeared to be in excellent condition. Electrical equipment was in excellent condition. The concrete slab was in good condition.
- Well 9 was recently rehabilitated and was generally in excellent condition. The security fencing was intact. The wellhead and associated motor, pump shaft, piping and valves appeared to be in excellent condition. Electrical equipment was in excellent condition. The concrete slab was in good condition.
- Well 10 was generally in good condition. The security fencing was intact. The wellhead and associated motor, pump shaft, piping and valves appeared to be in good condition. Electrical equipment was in good condition. The concrete slab was in good condition.
- Well 11 was generally in good condition. The security fencing was intact. The wellhead and associated motor, pump shaft, piping and valves appeared to be in good condition with light corrosion noted on the motor base. Electrical equipment was in good condition. The concrete slab was in good condition. A small sunken area of asphalt was present adjacent to the well and should be repaired.
- Treatment Unit 1 is generally in good condition. Effluent launders showed light to moderate corrosion in several locations – this should be addressed via sanding and repainting. Electrical equipment and instruments also appeared to be in good condition. The drive mechanism was in fair to poor condition and may require a new gearbox. Auxiliary pumps and associated piping, valves, and equipment were generally in good condition.
- Treatment Unit 2 was down for maintenance. The interior, including the visible parts of the cone and mixer were in good condition. The drive is new and appeared to be in good condition. Electrical equipment and instruments also appeared to be in good condition. Auxiliary pumps and associated piping, valves, and equipment were generally in good condition. This unit was out of service at the time of observation.
- Filters
 - Filter 1 was generally in good condition. Filter media appeared level and uniform. Piping and valves in the filter gallery were in very good condition. Effluent launders were in very good condition. The overall structure appeared to be in very good condition. No issues were identified with instrumentation.
 - Filter 2 was generally in good condition. Filter media appeared level and uniform. Piping and valves in the filter gallery were in very good condition. Effluent

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launders were in very good condition. The overall structure appeared to be in very good condition. No issues were identified with instrumentation.

- Filter 3 was out of service for media replacement and other maintenance. Piping and valves in the filter gallery were in very good condition. Effluent launders were in very good condition. The overall structure appeared to be in very good condition. No issues were identified with instrumentation.
- Filter 4 was generally in good condition. Filter media appeared level and uniform. Piping and valves in the filter gallery were in very good condition, but corrosion was noted around the effluent piping wall penetration. Effluent launders were in very good condition. The overall structure appeared to be in very good condition. No issues were identified with instrumentation.
- Filter 5 was generally in good condition. The underdrain appeared to be in excellent condition. Piping and valves in the filter gallery were in very good condition. Effluent launders were in very good condition. The overall structure appeared to be in very good condition. No issues were identified with instrumentation.
- Filter 6 was generally in good condition. Piping and valves in the filter gallery were in very good condition, but corrosion was noted around the effluent piping wall penetration. Effluent launders were in very good condition. The overall structure appeared to be in very good condition. Local instrument readouts on the filter control panels were difficult to read.
- Filter backwash pump 1, piping, valves, gauges, and appurtenances appeared to be in fair to good condition.
- Filter backwash pump 2 was out of service for maintenance, and the motor has been removed, piping, valves, gauges, and appurtenances appeared to be in fair to good condition. A crack exists along the corner of the grout pad that should be repaired.
- Filter backwash pump 3, piping, valves, gauges, and appurtenances appeared to be in good condition.
- Filter backwash pump 4, piping, valves, gauges, and appurtenances appeared to be in good condition.
- Clearwell transfer pump 1 and 2 are in fair condition. Of the two pumps, the one operating was making a grinding noise. Also, County staff indicated that transfer pump 2 has significant vibration issues, and that transfer pump 1 may also have vibration issues. Clearwell transfer pump 3 and 4 are in good condition. All piping, valves, gauges,

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appurtenances, and associated structures appeared to be in good condition. Electrical equipment for transfer pumps 1 and 2 (and other filter equipment) appeared to be in fair condition, and should be further evaluated for potential replacement due to its age and condition. Electrical gear associated with transfer pumps 3 and 4 appeared to be in excellent condition and was recently upgraded.

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- High Service Pumping
 - High service pumps 1, 3, 4, 5, 6 and 8 appeared to be in very good condition. Pumps, motors, piping, valves, gauges, appurtenances, and associated structures appear to be in very good condition.
 - High service pump 7 appeared to be in functional condition. Pumps, piping, valves, gauges, appurtenances, and associated structures have extensive amounts of moderate corrosion and/or cracked paint. It is recommended that this pump be re-coated in the course of normal maintenance activities.
 - High service pump electrical gear generally appeared to be in fair to good condition.
- Solids handling
 - Gravity thickener 1: the structure, rake and drive, and auxiliary pumps appeared to be in good condition. The check valves on decant pumps 1 and 2 have a small leak and should be repaired or replaced.
 - Gravity thickener 2: the structure, rake and drive, and auxiliary pumps appeared to be in good condition. The check valves on decant pumps 1 and 2 have a small leak and the check valve on pump 3 has a moderate leak and should be repaired or replaced. This thickener was out of service for routine maintenance at the time of the site visit.
 - Vacuum filters and associated vacuum pumps and electrical equipment generally appeared to be in fair to poor condition. Units 1, 2, and 3 have severe corrosion resulting in leaks. These units should be repaired/rehabilitated as needed.
- Chemical feed and storage systems
 - The carbon dioxide feed system, including refrigerated storage tanks and solution feeder panels, appeared to be in excellent condition.
 - The ferric chloride feed and storage system was in fair to good condition. The bulk storage tank appeared generally intact and functional. Metering pumps appeared to be functional. Calibration columns were open at the top, below the level of the bulk tank (this system does not have a day tank). This represents a potential spill hazard. Consistent with current practices, each calibration column should be capped with a vent pipe routed to above the liquid level of the bulk tank. The County initiated the design process for improvements to this system in FY 2015

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- The dry polymer makedown and feed systems were in good condition. Makedown and dilution units appeared generally intact and functional. Metering pumps appeared to be functional. The County initiated the design process for updates to this system in FY 2015
- The lime slaking and feed systems appeared to be in generally good condition. The lime silo, vibrator, rotary valve, and dosing unit appeared to be in good condition. Slakers appeared to be functional.
- The fluoride (HFS) feed and storage system was in fair condition. Bulk and day storage tanks appeared generally intact and functional. Metering pumps appeared to be functional. Calibration columns were open at the top. This represents a potential hazard. Consistent with current practices, each calibration column should be capped with a vent pipe routed to above the liquid level of the day tank. Electrical and mechanical equipment was extensively corroded inside the day tank/metering room. The County initiated the design process for improvements to this system in FY 2015. Piping color coding issues previously observed for this system had been corrected at the time of the inspection.
- The sodium hypochlorite feed and storage system, which was recently installed, was in good condition. Storage tanks are generally in very good condition, except for Day Tank No. 1, which has a leak near the discharge flange. This leak should be repaired. Containment area flooring is generally in good condition. Metering pumps are in very good condition. Minor leaks have been noted in the metering pump piping at several locations; however, reduction in system operating pressures have reduced the occurrence of leaks in the system. Light to moderate corrosion was observed on transfer pump equipment in the bulk storage area. Transfer pump equipment in the day tank room was in the process of being rehabilitated. Two of the four transfer pumps located in the bulk storage area were out of service at the time of the inspection.
- The sodium hydroxide system is not in service, and is not anticipated to be put into service within the foreseeable future. The bulk tank shares a containment area with ferric chloride and fluoride. Since sodium hydroxide can react violently with both of these chemicals, consideration should be given to permanently removing this tank.
- The gaseous ammonia system is generally in good condition. Bulk storage tanks are in very good condition. Ammoniators are in very good condition.
- The diesel fuel storage system is generally in excellent condition. Bulk storage tanks are in very good condition.
- Backup generators and associated equipment appeared to be in good condition.

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- The 5 MG storage tank is in fair condition, with minor seepage cracks or spalls visible. Paint appears to be in fair condition. Staff noted that the tank requires a new internal lining.
- The 1 MG storage tank is out of service due to a failure of the tank floor and is not anticipated to be put into service within the foreseeable future. Paint appears to be in fair condition.
- The 0.5 MG storage tank is in good condition, with no observed cracks or spalls. Paint appears to be in fair condition.
- The backwash tank is in good condition. Paint appears to be in excellent condition.
- Plant staff indicated that the air conditioning unit for the main building is in poor condition and is in need of replacement.

Plant modifications performed through FY 2015:

- Installation of lighting improvements for the plant (ongoing)
- Rehabilitation of well No. 7 (complete)
- Installation of new chlorine analyzers
- Connection of North High Service Pump building drains to new public sewer system

Plant modifications for FY 2016:

- Repair of clearwell spalling, repaint clearwell and treatment units
- Rehabilitation of laboratory cabinets and counter tops
- Repair of the roof on the lime silo tower and replace bag house (ongoing).
- Rehabilitation of chemical feed systems (ongoing).
- Rehabilitation of switch gear at high service pump room at building No.1 (ongoing)
- Design of a new 5 MG storage tank (ongoing)
- Resealing, media replacement, and repainting of Filter #6 of 6

Water Distribution System 3A

In December 2001, the City of Hollywood began providing water for resale to the County in System 3A. Then re-pumping facilities consisting of high service pumps supplying the 3A distribution system, which includes the Fort Lauderdale/Hollywood International Airport were constructed at the site of the former WTP 3A. The 3A facility was inspected on April 27, 2016. In general, the 3A facility appeared to be in fair condition, with potential operational issues that WWS is in the process of addressing, and potential issues with the integrity of a partially decommissioned building that still houses a functional piece of equipment that is maintained by County staff. Observations from the site visit are provided below.

- High service pump 1 appeared to be in good condition. The pump appeared to be in good condition, with moderate corrosion noted around the pump base that should be addressed as part of routine maintenance. The diesel engine backup drive associated with this pump appeared to be in good condition.
- High service pump 2 appeared to be in good condition. The discharge isolation valves and check valves appear to have been recently replaced. The VFD for this pump appeared to be in good condition. The VFD was wired to an emergency generator located outside the building, and portions of the wires serving this generator were not in conduit. If the County desires to maintain the ability to serve this VFD with a backup generator, it is recommended that a permanent, hard-wired generator connection receptacle be installed.
- High service pump 3 appeared to be in good condition. The discharge isolation valves, check valves, and piping are in good condition. Electrical gear serving this pump was aging, but functional.
- High service pump 4 appeared to be in good condition. The discharge isolation valves and check valves appear to have been recently replaced. Electrical gear serving this pump was aging, but functional.
- The water storage tank appeared to be in good condition. Light spalling was noted on isolated locations on the outer surface of the tank. The paint on the exterior was in fair to poor condition.
- The inflow meter and associated piping, valving, and instrumentation appear to be in good condition.
- The temporary sodium hypochlorite feed and storage system appeared to be in very good condition. The chlorinator unit was in excellent condition. County staff anticipates replacing this system with a permanent system in the near term to support 4-log virus treatment.

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- The ammonia storage and feed system appear to be in good to fair condition. Moderate corrosion was observed on the piping within the ammonia storage building.
- The diesel fuel storage system appeared to be in fair condition. Containment was intact. Corrosion was noted at the base of the diesel tank, which warrants further assessment and determination of repair is needed.
- The main diesel generator appears to be in fair condition. The structure in which the generator is housed had severe deterioration and large patches of mold visible. The partially decommissioned building is scheduled to be demolished.

Plant modifications to the plant for FY 2015:

- Installation of a new temporary hypochlorite system and terminated the use of chlorine gas (complete).

Planned modifications to the plant for FY 2016:

- Demolition of the existing treatment plant and adjacent plant building (ongoing)
- Construction of a new 2.5 mg storage tank (ongoing)
- Construction of 4-log disinfection improvements, including an upgraded temporary hypochlorite system (ongoing)
- Construction of new building to house new generator (ongoing)
- Construction of a new by-pass system (ongoing)
- Implementation of new site lighting system (ongoing)

Water Distribution System 3BC

The 3B area of the 3BC distribution system water supply is fed primarily by the City of Hollywood through two 12-inch potable water interconnect treatment stations located at the City's south system perimeter (on Pembroke Road at Park Road and at S.W. 57th Avenue). Another connection from the City of Pembroke Pines supplies water to the North Perry Airport perimeter. The County maintains a 2.5 MG storage tank and high service pumps and an emergency generator, all in very good condition. These facilities are remotely monitored and controlled via SCADA equipment/instrumentation. The 3B storage and pumping facility was inspected by Brown and Caldwell on April 27, 2016.

Overall, the four distribution high service pumps at the 3B facility and their associated piping and valving appear to be in good condition. Staff reports that pumps 2 and 4 appear to have insufficient head capacity to pump into the system. It is recommended that WWS further

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evaluate this claim to determine what action is required. The storage tank appears to be in good condition, with minor spalling noted in certain locations. The exterior paint was chalking, and it is recommended that the tank be re-painted. The backup generator and associated equipment appeared to be in good condition. The temporary hypochlorite system installed previously appeared to be in good condition, and is slated to be replaced with a permanent system in the future. The pump building exterior was generally in good condition.

The 3C storage and pumping facility currently consists of a 2.0 MG concrete tank and three high service pumps, VFD controls, sodium hypochlorite disinfection system and emergency standby diesel engine with generator housed in a new concrete building structure. The facility is equipped with a SCADA system to allow staff to monitor and control the facility operation remotely. The entire site is fenced with a decorative fence in the front of the facility and a standard 6-foot high chain link fence on the sides and back of the property.

Overall, the three distribution high service pumps at the 3C facility appear to be in good condition. The gate valve for Pump 2 has a small leak from the valve bonnet. Pump 3 has some corrosion on the top half of the casing and on the coupling that should be addressed. Check valves for pumps 2 and 3 were recently replaced. The water storage tank appears to be in good condition. One of the two sodium hypochlorite storage tanks leaks and is out of service, while the other is in good condition. The leaky tank should be fixed or replaced to provide redundant hypochlorite storage capacity at this facility. The sodium hypochlorite transfer/tank mixing pumps are not functional, but staff reports that the turnover of chemical in the tank is sufficient to maintain hypochlorite quality and strength. The ammonia system was generally in good condition. The chlorine analyzers installed at this facility have recently been replaced and are in excellent condition. The backup generator appeared to be in good condition. The pump building exterior was in excellent condition.

Retail Lift Stations

There are a total of 232 lift stations operated by the County. A representative set of 20 lift stations were inspected by Brown and Caldwell on May 11, 2016. Overall, the mechanical and electrical components (control panels, variable frequency drives, motor control centers, generators, telemetry units, pumps, pipes, and accessories) appeared to be in variable condition, as described below. The following serves to summarize the observations made during the visual inspection of the lift stations:

LS 10D2 This submersible pump-type lift station is in generally good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in good condition, with light corrosion noted. The valve vault was flooded at the time of site visit and consideration should be made to have a sump pump or drain installed. The

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wetwell was in good condition, with the liner fully intact. The electrical panel was in good condition.

- LS 10E2 This submersible pump-type lift station is in generally fair condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in fair condition, with light to moderate corrosion noted. The valve vault was flooded at the time of site visit due to a clogged drain, which should be addressed during routine maintenance. The wetwell was in fair to poor condition, with the wetwell liner almost entirely gone and the underlying concrete beginning to erode. The electrical panel was in good condition.
- LS 10M This submersible pump-type lift station is in generally good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in good condition, with light corrosion noted. The wetwell was in good condition, with the liner fully intact. The electrical panel was in good condition.
- LS 10N This submersible pump-type lift station is in generally good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in good condition, with light corrosion noted. The wetwell was in good condition, with the liner fully intact. The electrical panel was in fair condition, with some light corrosion noted on interior components.
- LS 21D5 This submersible pump-type lift station is in generally fair to poor condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in poor condition. Piping and valving were generally in fair condition, with moderate corrosion noted. The wetwell was in fair to poor condition, with the wetwell liner entirely gone and the underlying concrete is beginning to erode. Structural rebar was exposed on the wet well below the entry hatch. The valve vault was full of sediment, with the piping and valves nearly covered in sand. The electrical panel was in good condition.
- LS 23F This submersible pump-type lift station is in generally good condition. No pump issues were observed or reported, but pumps were below the wetwell water

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surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in good condition, with light corrosion noted. The wetwell was in good condition, with the liner showing a minimal amount of peeling. The electrical panel was in fair condition, with some light corrosion noted on interior components.

LS 24B This submersible pump-type lift station is in generally fair to good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in poor condition, with the wet well hatch bolts broken requiring routing maintenance and repair. Piping and valving were generally in fair condition, with moderate corrosion noted. The wetwell was in fair condition, with the liner showing extensive peeling. The electrical panel was in good condition.

LS 24D This submersible pump-type lift station is in generally fair condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in poor condition, with severe corrosion noted and a small leak on one of the check valves. The wetwell was in fair condition, with the wetwell liner entirely gone. The electrical panel was in good condition.

LS 24E1-1 This submersible pump-type lift station is in generally good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in good condition, with light corrosion noted. The wetwell was in good condition, with the liner fully intact. The valve vault was flooded at the time of site visit and consideration should be made to have a sump pump or drain installed. The electrical panel was in good condition.

LS 25B This submersible pump-type lift station is in generally very good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in very good condition. Piping and valving were generally in very good condition, with light corrosion noted. The wetwell was in good condition, with the liner fully intact. The valve vault was flooded during site visit due to high tidal groundwater. The electrical panel was in good condition.

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- LS 27B This submersible pump-type lift station is in generally fair condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in fair condition. Piping and valving were generally in good condition, with light corrosion noted. The wetwell was in fair condition, with the liner showing extensive peeling. There appeared to be debris in the wet well which should be removed during routine maintenance. The electrical panel was in fair condition, with some light corrosion noted on interior components. The wet well vent pipe has corroded away and should be repaired.
- LS 27C This submersible pump-type lift station is in generally good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in good condition, with moderate corrosion noted. The wetwell was in good condition, with the liner showing minimal peeling. The electrical panel was in good condition.
- LS 27F This submersible pump-type lift station is in generally good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in good condition, with light corrosion noted. The wetwell was in good condition, with the liner fully intact. The electrical panel was in good condition.
- LS 30G This submersible pump-type lift station is in generally excellent condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in excellent condition. Piping and valving were generally in very good condition, with light corrosion noted. The valve vault was flooded at the time of site visit and consideration should be made to have a sump pump or drain installed. The wetwell was in excellent condition, with the liner fully intact. The electrical panel was in very good condition.
- LS 30U This submersible pump-type lift station is in generally excellent condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in very good condition. Piping and valving were generally in excellent condition, with light corrosion noted. The wetwell was in excellent condition, with the liner fully intact. The electrical panel was in good condition.

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- LS 32E This submersible pump-type lift station is in generally fair condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in fair condition, with moderate corrosion noted. The wetwell was in fair condition, with the liner showing extensive peeling. The electrical panel was in fair condition, with some light corrosion noted on interior components.
- LS 50B This submersible pump-type lift station is in generally fair condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in fair condition. Piping and valving were generally in fair to good condition, with light to moderate corrosion noted. The wetwell was in fair to poor condition, with the wetwell liner almost entirely gone and the underlying concrete is beginning to erode. The backup power generator appeared to be in fair to good condition. The electrical panel was in good condition.
- LS 50T This submersible pump-type lift station is in generally good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in good condition, with light to moderate corrosion noted. The wetwell was in good condition, with the liner showing minimal peeling. The valve vault was flooded at the time of the site visit and consideration should be made to have a sump pump or drain installed. The electrical panel was in excellent condition.
- LS 51D This submersible pump-type lift station is in generally fair condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in poor condition with the valve vault hatch hinges broken. This should be addressed during routine maintenance and repair. Piping and valving were generally in fair to good condition, with moderate corrosion noted. The wetwell was in fair to poor condition, with the wetwell liner almost entirely gone. The valve vault was flooded at the time of the site visit and consideration should be made to have a sump pump or drain installed. The electrical panel was in good condition.
- LS 56B1-1 This submersible pump-type lift station is in generally good condition. No pump issues were observed or reported, but pumps were below the wetwell water surface and could not be directly observed. The wetwell and valve vault hatches were in good condition. Piping and valving were generally in good condition, with

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light corrosion noted. The wetwell was in good condition, with the liner fully intact. The electrical panel was in good condition.

Section 4 - Regional Wastewater System

Section 4 Regional Wastewater System

This section describes the North Regional Wastewater System (NRWWS) including the service area, visual inspection and review of the renewal and replacement program.

4.1 General Description

WWS owns and operates the North Regional Wastewater Treatment Plant (NRWWTP), which has provided contract wholesale wastewater services to large users plus the County since 1974. The current large users include the Cities of Coconut Creek, Coral Springs, Deerfield Beach, Lauderhill, North Lauderdale, Oakland Park, Pompano Beach and Tamarac; and, North Springs Improvement District (NSID), Parkland Utilities, and Royal Utilities. Service is also provided to WWS Districts 1 and 2 retail wastewater systems. The NRWWS includes 11 master pumping stations and approximately 66 miles of force mains. All of the wastewater collected from retail Districts 1 and 2 and large user customers are treated at the NRWWTP located in Pompano Beach, Florida. The plant has a permitted treatment capacity of 95 MGD of which 87.015 MGD has been reserved by the large users and the County. During Fiscal Year 2015, the annual average daily flow rate at the NRWWTP was approximately 67.2 MGD, and the plant currently has sufficient capacity to meet the projected demands of all large users and the County to at least the year 2035.

The large user agreements are substantially similar. Each is for a term that exceeds by one year the last payment of any wastewater system debt obligation applicable to the NRWWS. In addition to stipulating points of connection and establishing minimum quality limitations on all wastewater, the agreements designate reserve capacity in the plant for each user and provide for the method to charge each user for the availability and provision of service. The agreements also require the large users to deliver all wastewater collected to the County. On a monthly basis, each user is billed a fixed charge depending upon the user's reserve capacity in the plant. This fixed charge is designated to recover each large user's equitable share of debt service including required coverage (1.2 x principal and interest). The operation and maintenance costs associated with provision of treatment and transmission service, also billed monthly to each large user, are based upon the large user's pro rata usage of the NRWWS. Additionally, the contracts provide restrictions on excessive and peak flows, limitations on types of waste allowed to be discharged, and requirements to pay for damages caused by a large user.

The NRWWTP was designed and constructed in accordance with a master plan approved by regulatory authorities specifically to encourage the use of regional, technologically advanced wastewater treatment processes and to discourage development and use of smaller, less efficient systems. A difficult permitting process, outstanding contractual obligations with the County and high capital costs of constructing and operating a new facility should discourage any large users from abandoning the NRWWS. The agreements as executed by the large users are binding and can only be terminated upon mutual consent of the County and the large user.

The NRWWTP utilizes an activated sludge treatment process for liquid treatment and an anaerobic digestion system for handling the biosolids produced from the liquid treatment process. After digestion, the sludge is dewatered and disposed of by landfilling and land spreading. The effluent from the liquid treatment process is either chlorinated and pumped

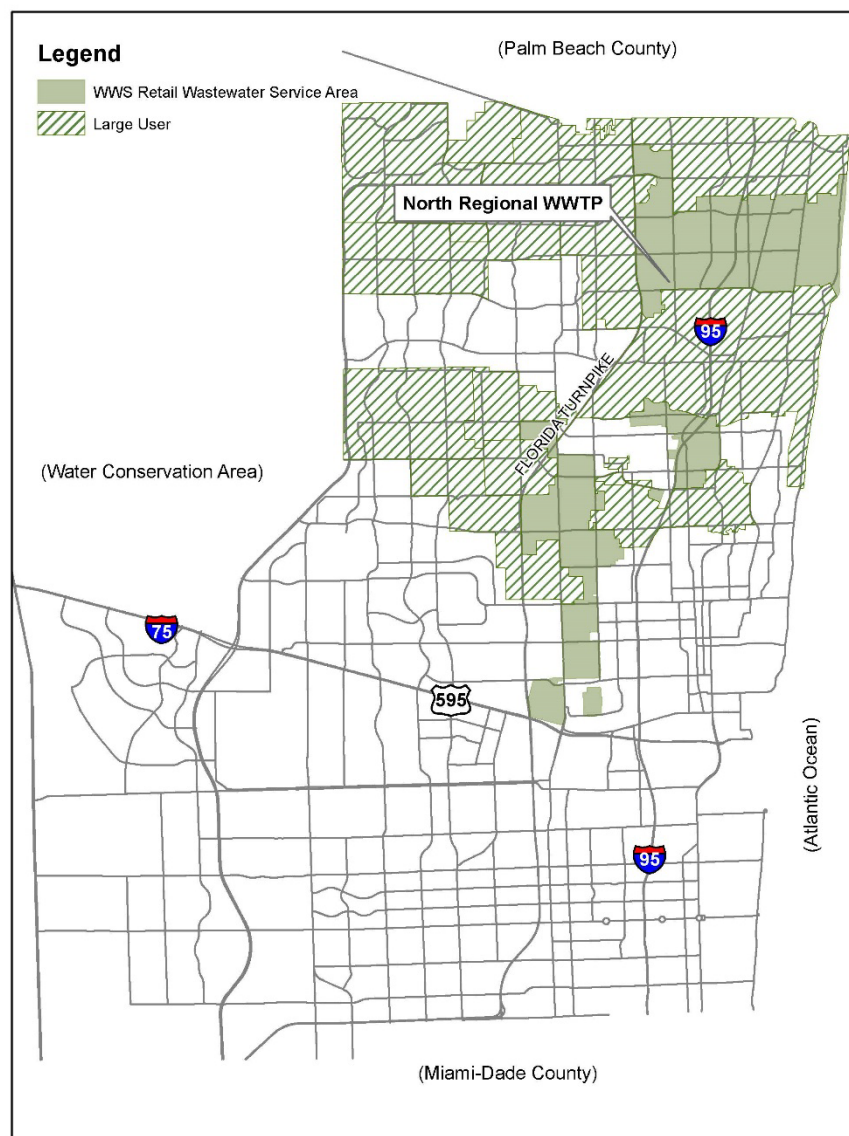
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through the outfall pipe into the Atlantic Ocean, disposed of in on-site deep injection wells, or chlorinated and filtered via the County's 10 MGD reclaimed water system. The reclaimed water is used for irrigation and industrial process water at the Waste-to-Energy Plant (Wheelabrator North Broward Plant), the Septage Receiving Facility and the NRWTP as well as for landscape irrigation at a nearby commerce center.

Service Area and Customer Base

Figure 4-1 shows the NRWWS service area. All of the wastewater collected from retail Districts 1 and 2, and all large user customers, are treated at the NRWTP located in Pompano Beach, Florida.

Figure 4-1 WWS Wastewater Large User Service Areas



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The NRWWS service area provides service to 35 percent of the population in the County through providing wholesale treatment services to large users and services to the County's retail customers in Districts 1 and 2 (District 3 treatment is provided by contract with the City of Hollywood at the South Regional Wastewater System). Service is provided pursuant to individual, contractual agreements between the County and each large user. Generally, such agreements specify each large user's reserve capacity in the plant and provisions for billing and payment for service. As noted, the large users and WWS have currently subscribed to 87.015 MGD of the 95 MGD of treatment and disposal capacity.

Table 4-1 provides a summary of historical large user wastewater flow rates for treatment and disposal. The reserve capacity for each large user of the NRWWS is shown in Table 4-2. Table 4-3 provides information on the wastewater annual flows for the past five years. Collectively the system user will not exceed permitted plant capacity through at least 2035. As such, obligations to individual large users for wastewater flows do not currently constitute an issue from the standpoint of available plant capacity.

Table 4-1 Summary of Historical Large User Wastewater Average Monthly Flow for Treatment and Disposal (1,000 Gallons)

Large User	FY 2013	FY 2014 ¹	FY 2015	Change From Prior Year	% of Change
Coconut Creek	124,323	122,466	123,283	817	0.67%
Coral Springs	244,380	220,419	216,483	(3,936)	-1.79%
Deerfield Beach	177,375	170,908	168,645	(2,263)	-1.32%
Lauderhill	188,594	189,115	180,403	(8,712)	-4.61%
North Lauderdale	107,685	126,269	113,280	(12,989)	-10.29%
NSID	82,726	84,236	85,888	1,652	1.96%
Oakland Park	45,841	44,711	42,816	(1,895)	-4.24%
Parkland Utilities	6,217	6,339	6,457	118	1.86%
Pompano Beach	409,431	435,906	383,692	(52,214)	-11.98%
Royal Utilities	8,791	8,712	7,920	(792)	-9.09%
Tamarac	254,642	250,546	222,589	(27,957)	-11.16%
Subtotal	1,650,005	1,659,627	1,551,456	(108,171)	-6.52%
Broward County	414,721	446,743	403,257	(43,486)	-9.73%
Total	2,064,726	2,106,370	1,954,713	(151,657)	-7.20%

¹ Higher flows in FY 2014 compared to FY 2013 are believed to be related to infiltration and inflow associated with high rainfall in 2014

Source: Broward County Water and Wastewater Services

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Table 4-2 North Regional Wastewater System Reserve Capacity as of September 30, 2015 (MGD)		
Large User	Capacity	
	Treatment	Transmission
Broward County	19.420	19.42
Coconut Creek ¹	6.540	4.41
Coral Springs	9.790	9.79
Deerfield Beach	8.500	8.50
Lauderhill	7.100	7.10
North Lauderdale	4.400	4.40
N S I D	3.530	3.53
Oakland Park	1.520	1.52
Parkland Utilities	0.265	0.27
Pompano Beach ¹	17.000	N/A
Royal Utilities	0.450	0.45
Tamarac	8.500	8.50
Total	87.015	67.89
<i>1 All of Pompano Beach and portions of Coconut Creek do not use the North Regional Wastewater System transmission facilities.</i>		
<i>Source: Broward County Water and Wastewater Services</i>		

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Table 4-3 Summary of Large User Wastewater Treatment Annual Flows Five-Year History as of September 2015 (1,000 Gallons)

Large User (LU)	Fiscal Year 2011¹	Fiscal Year 2012²	Fiscal Year 2013	Fiscal Year 2014	Fiscal Year 2015
Coconut Creek	1,276,592	1,447,199	1,491,870	1,469,596	1,479,397
Coral Springs	2,516,794	3,128,012	2,932,561	2,645,025	2,597,792
Deerfield Beach	2,018,628	2,190,729	2,128,498	2,050,891	2,023,739
Lauderhill	2,000,517	2,403,809	2,263,122	2,269,385	2,164,841
North Lauderdale	1,078,407	1,427,346	1,292,221	1,515,225	1,359,362
NSID	991,983	1,115,514	992,712	1,010,832	1,030,656
Oakland Park	529,162	638,795	550,088	536,527	513,792
Parkland	74,642	76,984	74,607	76,065	77,485
Pompano Beach	4,496,220	5,009,080	4,913,176	5,230,870	4,604,300
Royal Utilities	90,004	90,382	105,492	104,544	95,037
Tamarac	2,642,672	3,529,445	3,055,706	3,006,553	2,671,066
Total LU	17,715,621	21,057,295	19,800,053	19,915,513	18,617,467
Broward County	4,046,268	4,931,347	4,976,657	5,360,913	4,839,080
Total LU and County	21,761,889	25,988,642	24,776,710	25,276,426	23,456,547

1 The infiltration and inflow programs, water conservation efforts and water restrictions appear to have reduced water sales and the amount of water returned to the wastewater system between FY 2010 and FY 2011.

2 Higher flows in FY 2012 compared to FY 2011 and FY 2013 are believed to be related to infiltration and inflow associated with high rainfall in 2012.

Source: Broward County Water and Wastewater Services

4.2 Wastewater System Regulatory Requirements

Operations of the NRWWTP are regulated by the EPA, the Florida Department of Environmental Protection (FDEP) and the Broward County Environmental Protection and Growth Management Department (EPGMD). Regulatory requirements are focused on effluent management, sludge disposal, reclaimed water and industrial pretreatment.

In Fiscal Year 2015, the North Regional Wastewater Treatment Plant (NRWWTP) had no permit violations. The NRWWTP is in compliance with effluent quality standards.

4.3 Wastewater Effluent Management

The NRWWTP currently disposes of treated effluent via an open ocean outfall and deep injection wells. Additionally, a portion of the effluent is treated to public-access quality and distributed for reuse via a reclaimed water system. The open ocean outfall is regulated through the Federal National Pollutant Discharge Elimination System (NPDES) permit program,

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administered by the FDEP. Deep injection wells are permitted by the FDEP Underground Injection Control Section.

The County's facility permit from the FDEP rates the NRWWTP at 95 MGD and acknowledges 66 MGD of effluent disposal capacity through the ocean outfall. The current NRWWTP permit was issued on January 25, 2013 and became fully enforceable in March 2013.

The FDEP continues to promote a reduction of nutrients in the face of opposition to ocean discharges from interested groups. They have worked with the wastewater utilities with ocean outfalls (including Broward County) to reduce the economic impact of the Leah Schad Memorial Ocean Outfall Program, which became the law effective July 1, 2008. Initially, this law required that the disposal of effluent through ocean outfalls be eliminated by 2025. In 2013, the Florida Legislature passed the following amendments to the act:

- Allows peak flow backup discharges not exceeding 5% of the facility's cumulative baseline flow, measured on a 5-year rolling average and requires that such discharges meet the FDEP's applicable secondary waste treatment and water-quality-based effluent limitations.
- A detailed plan was submitted to FDEP in July, 2013 which identified technically, environmentally and economically feasible reuse options. The plan included an analysis of the costs associated with meeting state and mandated nutrient reduction requirements, and the detailed schedule for implementation of all necessary actions. Requires FDEP, SFWMD and the outfall utilities to consider the above information for the purpose of adjusting, as needed, the reuse requirements, and requires FDEP to report to the Legislature any changes that may be necessary in the reuse requirements by February 15, 2015.

In order to meet the advanced wastewater treatment requirements of the rule, the County has implemented cumulative nutrient reduction strategies including modifying the existing treatment process to augment biological nutrient removal and reduce outfall discharges via diversion to the existing deep injection well system.

In addition to the ocean outfall, the effluent management system also includes six Class I deep injection wells. The Operation Permit 0051336-502-UO for Injection Wells 1 through 6 was issued on July 2, 2010 and is valid for five (5) years. A Conditional Permit was recently issued.

The County's effluent management program currently includes a 10 MGD system providing highly treated reclaimed water for industrial and landscape uses. As a requirement of the Leah Schad Memorial Ocean outfall Program described above, the County will be required to increase production of reclaimed water by 2025 and is currently in discussions with Palm Beach County for the creation of a regional reclaimed water system to beneficially reuse up to 15 MGD of reclaimed water. Long-term effluent management improvements include combinations of injection wells, Biscayne Aquifer recharge, Floridan Aquifer recharge, offsite large user reuse, and residential reuse. An increase in the consumptive use permit raw water allocation for the water treatment facilities may be authorized by the SFWMD when effluent management results in the potential beneficial reuse of the reclaimed water.

4.4 Biosolids Management

Pollutant concentrations in wastewater residuals are regulated by both federal and state sludge regulations. The federal regulation that currently regulates disposal is 40 CFR Part 503. The Part 503 rule regulates five categories of wastewater residuals disposal: agricultural land application, non-agricultural land application, distribution and marketing, monofills and surface disposal. WWS currently employs landfilling (20,000 tons per year) and land-spreading (70,000 tons per year) for wastewater residuals disposal. The County has a current contract to dispose of biosolids by land application.

The County is currently managing most biosolids by land application of the treated residuals. Land application is a beneficial reuse of this wastewater treatment byproduct and is subject to both federal and state regulations. The County produces Class B residuals allowable for application to non-food agricultural sites.

In August 2010, revisions to the state regulations governing the treatment and disposal of biosolids, Chapter 62-640 F.A.C., went into effect. The NRWTP became subject to the new regulations upon renewal of the facility's operating permit in January, 2013. New land application sites were permitted under these new regulations. While land application continues to be an option, permitting of sites will likely be at greater distances, potentially making hauling to new disposal sites more costly. The County has secured alternate disposal capacity at a nearby Class I landfill and continues to investigate cost-effective long-term biosolids management alternatives. Disposal at the landfill meets all current federal, state and local regulations and since the landfill cogenerates electricity from its methane gas production, this disposal option is currently the most carbon neutral.

4.5 Wastewater Large User Agreements

The County is under obligation to provide large users with capacity under the terms of Large User Agreements (Agreements) it has executed with the cities of Coconut Creek, Coral Springs, Deerfield Beach, Lauderhill, North Lauderdale, Oakland Park, Pompano Beach and Tamarac, the North Springs Improvement District (NSID), and the private utility companies of Parkland Utilities, Inc. and Royal Utilities. The Agreements provide for wastewater transmission, treatment and disposal services. The Agreements terminate at the end of the County's fiscal year following the date all obligations, notes or bonds at any time issued for the NRWTP and associated transmission and disposal facilities, or any part thereof, are retired or satisfied. The current large user reserved capacity in the NRWTP is set forth in Table 4-2.

The Agreements are substantially alike in form and a brief summary of significant provisions follows:

- A. Provisions Pertaining to Connection to the County System. The Agreements require that during the term of the Agreement, each user, except the City of Oakland Park, will deliver all existing water flows collected by it to the County. Oakland Park sends a portion of their flow to the City of Ft. Lauderdale's wastewater treatment plant. The outstanding contractual obligations with the County and high capital costs of constructing and operating a new facility capable of meeting current effluent quality requirements may discourage any withdrawal of users from the NRWWS.

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The Agreements also identify the points of connection of the users' systems to the County's system, and state that the user will convey to the County land needed by the County for the point of connection and access thereto. The users agree to maintain their own systems, the elevation and pressure of which are required to be sufficient to deliver wastewater to the County's facility without backing up or reversing flow. The users' systems must include provisions to prevent excessive peak flow rates and extended periods of no flow. Each of the users must list estimates of its future flows in the Agreement and the user must submit annual updates of these estimates to the County. The County is required to use these estimates to plan future treatment capacity and to determine whether facilities should be extended or modified. The County's obligation to provide service is limited to the capacities reserved by users, which may be increased or decreased by amendment or modification to the Agreements. The Agreements allow users to lease or sell excess capacity to other users, subject to the County's approval. The County is required to install and maintain a meter at each point of connection to determine the volume and rates of flow and to inspect the meters at least annually to determine the accuracy thereof. The Agreements provide for credits or additional charges in the event of the inaccuracy of the meters. If the meters are inoperative, the users are required to pay an amount based on the average flow of the prior month.

- B. Provisions Relating to Discharge Sampling. The Agreements specify quality limitations for wastewater discharges. A user's failure to comply with these limitations places the user in default under this Agreement and allows the County either to initiate programs to bring the user's discharge into compliance at the user's expense or to seek damages from the user. A user's system must include a sampling station and the user must, upon receipt of written request from the County, submit a complete laboratory analysis of a composite sample of combined wastes leaving the user's facilities. The County and the user may enter into an agreement whereby the County would accept wastewater with a strength or other characteristic that exceeds parameters listed in an existing agreement. In this case, the County may impose surcharges on the system supplying such a wastewater.
- C. Provisions Pertaining to Charges. The County is required to conduct an annual review of the costs of providing service to users, which will provide the preliminary basis for establishing fees, rates and other charges for the next succeeding fiscal year. The fees and rates charged to the users constitute the full cost of the transmission, treatment and disposal services provided to the users, including operation and maintenance charges and debt service charges for both the NRWWTP and the NRWWS transmission facilities, and include an Improvement Repair and Replacement Surcharge. Such fees, rates and charges are required to be set at a public hearing by the Board, which must be held after 30 days written notice to the users. The Board is required to consider recommendations of the individual users or the advisory board, which is composed of representatives from each of the users. The operation and maintenance charges applicable to the NRWWTP or the transmission system are included in the monthly rate charged to the users based upon the users' actual monthly flow in thousands of gallons. The rate is to be set by dividing the total annual budgeted operation and maintenance expense for each fiscal year by the number of gallons estimated to be treated or

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transmitted in that fiscal year, and is to be adjusted at year end to reflect the actual number of gallons treated and actual operation and maintenance expense. This adjustment is either collected from, or remitted to, the large users in the subsequent year.

The debt service charge included in monthly rates charged to the large users include principal, interest and coverage requirements on debt obligations issued at any time for the NRWWS and is computed by determining the ratio of the amount of capacity reserved by the user to the amount reserved by all users. The debt service charge for the NRWWS transmission facilities is computed by reference to transmission reserved capacity in the same manner. A user's contribution to the Improvement, Repair and Replacement Surcharge, which is part of the monthly rate charged to users, may not exceed 10 percent of that user's monthly bill. In addition, the Agreements provide for additional charges in the event that a customer requests additional transmission or treatment capacity or in the event that the monthly flow of a user exceeds the capacity reserved by such user for three consecutive months. A user that fails to pay the monthly bill within 45 days of its due date is required to pay an interest penalty on the unpaid balance; and if the payment is not made within 60 days, the user is in default of the Agreement and the County may enforce the Agreement by suit. The users agree to establish service charges or other means of obtaining funds sufficient to enable them to pay the monthly charge.

- D. Provisions Pertaining to Additional Obligations of Both Parties. The Agreements provide that the County will extend and expand its NRWWS to provide for the user's scheduled flow. The users must deliver their wastewater to the County facilities for treatment and the County must accept all wastewater flows collected by the users, provided the amount of such flow does not exceed the capacity reserved by such users.
- E. Provisions Pertaining to Violations and Exceptions to the Terms of Agreements. If a user violates the Agreement, the County must give written notice of the violation and allow a reasonable time to correct the violation. The user must correct the violation within the stated time. If either party violates the Agreement, that party becomes liable to the other for any expense, loss or damage occasioned by such violation; provided that any payment by the County to a user for violation of any provision of the Agreement shall be from any legally available source other than the revenues pledged to any bondholders. If there is a dispute concerning a violation that cannot be settled, the user will pay the full amount billed, and the amount in dispute will be escrowed or held in a joint trust, interest-bearing bank account and held pending settlement of such dispute. Each user agrees to hold the County harmless from costs and expenses incurred by such user or the County in any litigation resulting from the improper introduction of materials by such user into the County facility. Any temporary cessation of wastewater transmission and treatment services caused by an act of God, a fire, strikes, casualty, necessary maintenance work, breakdown of or injury to machinery, pumps or pipeline shall not constitute a breach of the Agreement. The County is required to accept and dispose of wastewater transmitted by the users, if physically possible, regardless of the

degree of treatment available, until written notice to the contrary is received from a government agency.

- F. Provisions Relating to the Term of the Agreements and Cancellation. The users and the County were bound by the Agreements at the date of their execution. The County and each user may terminate their Agreements by mutual written consent. Otherwise, the Agreements terminate at the end of the County's next full fiscal year after all obligations issued at any time during the term of the Agreements for the NRWWS have been retired or satisfied.

4.6 Visual Inspection and Review

Master Lift Stations

Five Master Lift Stations (MLS 440, 451, 452, 454, and 462) were inspected on May 25, 2016. Lift stations were chosen based on their previous inspection history, with stations representing the longest time since inspection being selected. All five lift stations appeared to be in good condition and operating satisfactorily. A summary of the findings at each station is presented below.

MLS 440 This master lift station, an inline booster-type station, was recently refurbished and is generally in excellent condition. Pumps, motors, and interior station piping were in excellent condition. Pump control valves appeared to be in excellent condition. The backup power generator and fuel storage appeared to be in excellent condition. The building interior and exterior were generally in good condition.

MLS 451 This master lift station, an inline booster-type station, is generally in fair to good condition. Pumps, motors, and interior station piping were in good condition, with some corrosion present at pump bases. Pump bases should be sanded and recoated. Pump control valves appeared to be in good condition. The air release valve on the discharge force main has a significant leak (which appears to have been routed to the on-site lift station) and should be replaced. The backup power generator and fuel storage appeared to be in good condition. An electrical control panel was observed to be open – the underlying reason for leaving this open should be identified and corrected. The building interior and exterior were generally in fair to good condition.

This MLS appears to have operational issues that need to be addressed. During the course of the inspection, pump 1 appeared to “hunt” through a range of VFD speeds. Also, pumps started and stopped frequently, with cycle times as low as one minute. The operation of this station should be reviewed and relevant settings and equipment changed/fixed as needed to achieve acceptable operation.

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- MLS 452 This master lift station, an inline booster-type station, is generally in fair to poor condition. Pumps, motors, and interior station piping were in fair to poor condition, with some light corrosion present. Pump control valves appeared to be in poor condition. The modulating valve for Pump 1 had a significant leak at the time of the site visit and should be replaced. In addition, this station lacks a shutoff valve on the suction end of the station, requiring the station to be shut down completely for repairs. A valve should be added to the suction line to facilitate these repairs. The backup power generator appeared to be in good condition. The electrical equipment and VFD's were in fair working condition but are functionally obsolete. The building interior and exterior were generally in good condition.
- MLS 454 This master lift station, an inline booster-type station, is generally in fair to good condition. Pumps, motors, and interior station piping were generally in good physical condition. Valves were generally in good condition. Station electrical gear also appeared to be in fair to good condition. The building interior and exterior were generally in good condition. On-site water service lines are rusting and should be replaced. In addition, a water service pipe is located over the existing electrical equipment and presents a significant hazard in the event of a leak. This line should be re-routed away from the electrical room. The backup power generator appeared to be in fair condition. The electrical equipment and VFD's were in fair working condition but are functionally obsolete.
- MLS 462 This master lift station, an inline booster-type station, is generally in very good condition. Pumps, motors, interior station piping, and pump control valves appeared to be in very good condition. The backup power generator is new and appeared to be in very good condition. The electrical equipment and VFD's were in excellent condition. The building interior and exterior were generally in good condition.

North Regional Wastewater Treatment Plant

The visual inspection of the NRWTP was performed on May 5, 2016. The inspection consisted of visual observation of selected major process units and supporting equipment to generally establish the condition and functionality of major unit processes. In general, equipment appeared to be able to perform its intended function. Based on the facility's ability to continuously meet permit requirements, the facility appears to be operated in a sound manner. A summary of key observations for each process area are as follows:

- Headworks: In general, headworks equipment appeared to be in good condition and functioning normally.
- Treatment Module A

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- In general, aeration basin structures and piping appeared sound. Cracks and spalls in concrete walkway supports were observed and should be repaired. Aeration unit motors were in fair condition, with some motors having cracked fan shrouds and/or making noises that indicate that maintenance may be needed in the near term. Removal of the existing aerator motors and gear reduction drives during the planned future conversion to fine-bubble aeration will resolve these issues. One aeration basin was out of service at the time of the site visit.
- All clarifiers appeared to be in fair condition, with all showing moderate corrosion in the area of the drive mechanisms. One clarifier was out of service for rehabilitation work.
- In general, the Module A Return Activated Sludge (RAS) pumping station appeared to be in fair to good condition. Maintenance may be needed on the seal of Pump No. 3.
- Treatment Module B
 - In general, aeration basin structures and piping appeared sound. Aeration unit motors were in fair condition, with several motors having cracked fan shrouds and/or making noises that indicate that maintenance may be needed in the near term. Removal of the existing aerator motors and gear reduction drives during the planned future conversion to fine-bubble aeration will resolve these issues. Two aeration basins were out of service at the time of the site visit due to a bad inlet valve.
 - Clarifiers were generally in fair condition, with all showing moderate corrosion in the area of the drive mechanisms.
 - In general, the Module B Return Activated Sludge (RAS) pumping station appeared to be in fair to good condition.
- Treatment Module C
 - In general, aeration basin structures, piping, and equipment appeared to be in good condition.
 - In general, clarifiers were in fair to good condition, with all showing moderate corrosion in the area of the drive mechanisms. In general, the Module C Return Activated Sludge (RAS) pumping station appeared to be in good condition. Moderate corrosion was noted on the pumps with sanding and re-coating needed in select areas.
- Treatment Module D

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- In general, aeration basin structures, piping, and equipment appeared to be in fair condition.
- In general, clarifiers were in fair to good condition. The drive mechanisms for two of the clarifiers are scheduled for replacement. Module D Return Activated Sludge (RAS) pumping station appeared to be in good condition. The exterior modulating valves on the intake clearwell are severely corroded and scheduled for replacement.
- Treatment Module E
 - In general, aeration basin structures, piping, and equipment appeared to be in good condition.
 - In general, clarifiers were in good condition. The Module E Return Activated Sludge (RAS) pumping station appeared to be in good condition.
- Ocean outfall pump station
 - Outfall pumps: the six vertical turbine ocean outfall pumps generally appeared to be in fair to good condition. Light corrosion was observed around the motor bases which should be addressed by sanding and recoating. In addition, light spalling of the concrete support bases was evident on a few of the motors.
 - Electrical equipment: The motors, liquistat system and associated cooling units appear to be generally functioning in a satisfactory manner.
 - Chlorine contact basins associated with the outfall were generally in good condition. The sodium hypochlorite feed system appeared to be generally in good condition.
- Deep Injection Well pump station
 - The deep injection well pumps, motors, and supporting electrical equipment all appeared to be in fair to good condition. Plant staff indicated ongoing packing issues with the strainers. Pump No. 3 was out of service for routine maintenance at the time of the site visit.
- Water reuse system
 - The reuse system feed pumping station generally appeared to be in good condition.
 - The self-backwashing sand filters were generally in good condition.

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- The reuse chlorine contact chambers generally appeared to be in good condition.
- The high head and low head reuse pumps generally appeared to be in good condition.
- Digester complex
 - Seven out of eight digesters generally appeared to be in good condition, with the digesters currently undergoing exterior re-coating. Digester P-3 has been out of service for an extended period of time, and is currently being rehabilitated.
 - Sludge Pumping – the County has been replacing old piston-style pumps with new progressive cavity (Moyno) pumps. The new pumps are generally in good condition.
 - Boilers
 - The boilers serving digesters 1, 2, 3, and SEC appear to be in good to fair condition. Boiler 1 was out of service due to leaks. The five boilers serving digesters 4-7 appear to be in good condition, with Boilers 4 and 8 being recently replaced. The digester cluster electrical gear appears to be generally in fair condition, with a light to moderate amount of surface rust present on cabinet and panel surfaces.
- Biosolids processing:
 - Dissolved Air Floatation (DAF) thickeners generally appeared to be functioning adequately. Units 3 and 6 were offline at the time of the site visit for rehabilitation. According to staff, the polymer feed system serving the DAF building was not being used.
 - Belt filter presses and associated equipment were generally in good condition, with the exception of significant amounts of corrosion observed on some drive motors, especially on the fan shrouds. Press 1, 2, 3, 4 and 8 had mild to moderate corrosion on motors and shrouds. It is recommended that all corroded fan shrouds be replaced. The supporting polymer feed system components, including pumps, tanks, piping, and electrical gear, appeared to be in very good condition.
- Backup generators:
 - The backup generators and associated equipment appeared to be in good condition. Generators 1, 2 and 3 were in excellent condition. Generator 4 was down for maintenance at the time of the site visit. Generator 5 and 6 were

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generally in good condition. The secondary containment for day tank 5 appeared to contain diesel fuel and the condition of the tank should be verified by plant staff.

- The diesel fuel storage system is generally in good condition. Bulk storage tanks are in fair to good condition. Plant staff indicated that the underground bulk storage tanks are scheduled to be replaced.

Plant modifications performed through FY 2015:

- Repair aeration weirs at A-1 and A-2 MOD
- Replacement of boiler Nos. 4 & 8 at north complex
- Replace pump and shredder at No.7 slot
- Replacement of aerator shroud at B-2 Basin
- Replacement of clarifier drive at D-2 and D-3
- Add skids for chlorine injection system for clarifier rings at Modules A, B and C
- Repaint aerator weirs at A-1 thru A-6 steel structure
- Replacement of 20 underground reuse valves throughout the plant
- Replacement of damaged concrete slab for effluent pump No. 3
- Headworks gates and screen upgrades
- Re-installation of ocean outfall pump No. 3
- Repair of high speed pump control for ocean outfall pump station.

Plant modifications to be initiated for FY 2016:

- Replacement of grit capture system (five units) and Modules A, B, and C influent piping (future)
- New Injection well booster pump stations (ongoing)
- Boiler 1 – 8 replacement (future)
- Automatic bar screen replacement (five units) (future)

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- Replacement of six 10,000 gallon underground diesel tanks with two 30,000 gallon above-ground tanks (future)
- Improvements to the Ocean Outfall Pump Station system (future)
- Repair of E1 Clarifier mechanism (future)
- Modules A, B & D diffused air (future)
- Replacement of generator No.4 (ongoing)
- Eliminate evaporators at the chlorine facility; change piping and add two (2) scales (ongoing).
- Replacement of cover at Digester P3 (ongoing)
- Replacement of the SCADA system (future)
- Replacement of emergency generator at MPS 462 (ongoing)
- Installation of FOG unit in partnership with Optera (ongoing)

Septage Receiving Facility

The Septage Receiving Facility receives waste from septic tank pump outs, portable toilets, vacuum trucks, grease traps, leachate from landfills, etc. The waste is separated into two categories: liquids and solids. The equipment, which must be maintained, includes transfer pumps and electrical control panels, a diesel generator set, biofilters and miscellaneous valves.

The Septage Receiving Facility was inspected on April 25, 2016. The facility inclusive of liquid pumps, solids discharges area, liquids discharge area, and office building appears to be in good working condition. Major upgrades to this facility are underway as part of the NRWTP Cogeneration project with Optera. Installation of the aerator grit chamber and biofilter odor control system is nearly complete.

Facility modifications performed in FY 2015:

- Demolition of existing equipment, fencing and access ways required (ongoing).
- Installation of aerator grid chamber (ongoing).
- Repair of existing septage receiving station, including rehabilitating the wet well, replacement of cover and removal of non-working equipment (ongoing).
- Installation of new biofilter odor control system (ongoing).

Section 4 - Regional Wastewater System

- Implementation of landscaping and irrigation system improvements (ongoing).The proposed modifications to be initiated for FY 2016:
- Design of new administrative building and reclaimed water pump.

WWS Administrative Complex

A visual inspection of the WWS Administrative Complex needs to be performed outside of the Annual Report. The inspection should consist of a visual observation and assessment of the administrative building (Building 1), and operations building (Building 2) and equipment to establish the condition, functionality, and needed improvements.

Section 5 - Regional Raw Water Supply

Section 5 Regional Raw Water Supply

There are currently two wellfields operated by Broward County as part of the regional system, the North Regional Wellfield (NRW) and South Regional Wellfield (SRW). This section describes the regional raw water supply system, including the large users, physical descriptions and permit limitations.

5.1 General Description

The Biscayne Aquifer, currently the County's primary source of drinking water, is subject to saltwater intrusion. In 1986, the County adopted the Regional Raw Water Supply (RRWS) Program, which called for centralized wellfields located further inland to ensure a long term water supply for Broward County coastal communities. Under the program, wellfields and raw water delivery systems were financed, constructed and operated as regional water supply system supporting large raw water users. The large users currently purchasing raw water from the regional supply system are Dania Beach, Deerfield Beach, Hallandale Beach, Florida Power and Light Corporation (FPL), Hollywood and WWS District 2. The two regional supply wellfields (NRW and SRW) were constructed using general County revenues and the assets were contributed to the Utility. Figure 5-1 depicts the regional wellfield locations and service areas. Physical descriptions of the NRW and the SRW are presented in Tables 5-1 and 5-2.

Section 5 - Regional Raw Water Supply

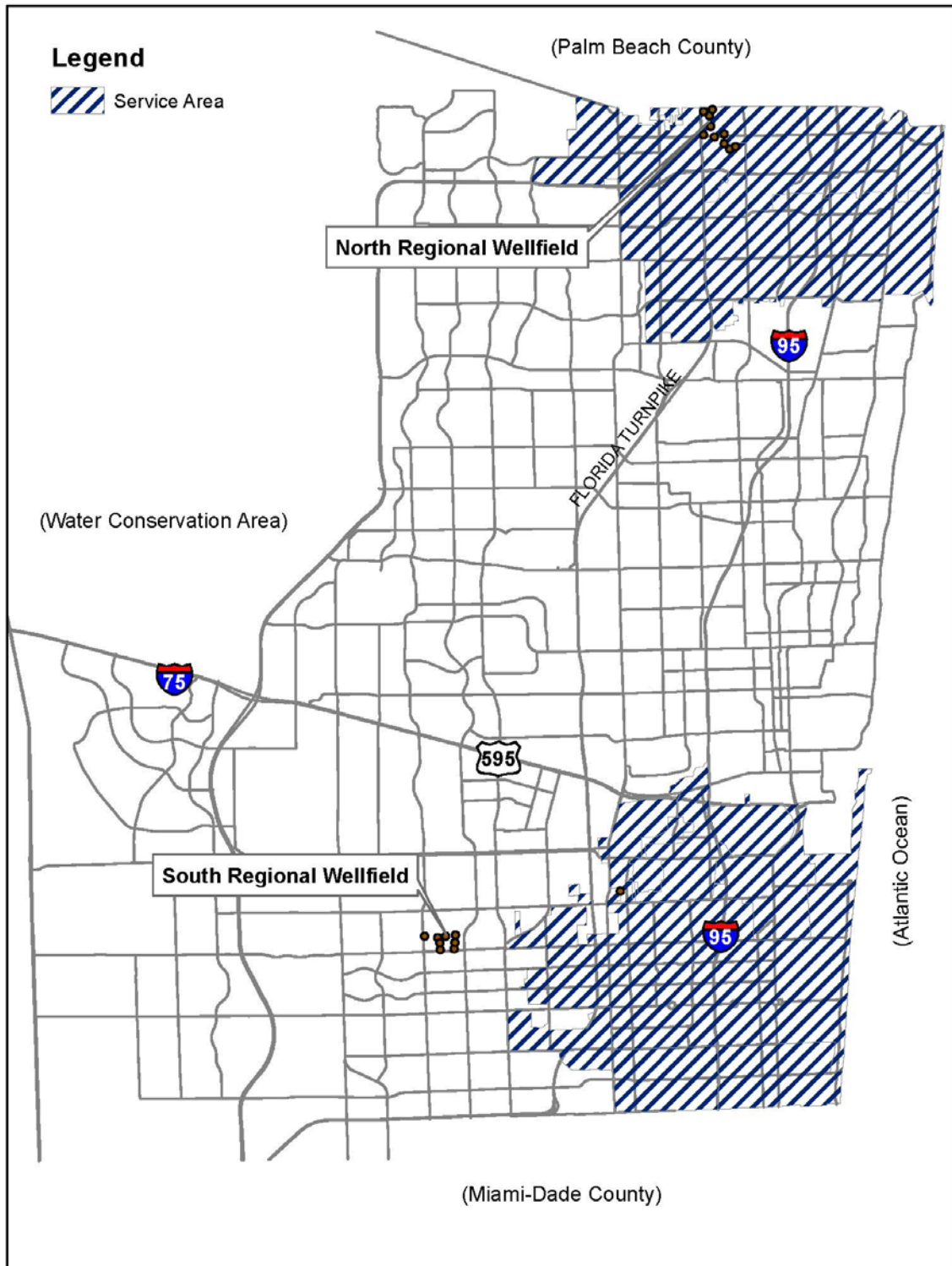
Table 3 NRW Physical Descriptions

Wellfield	Well No.	Size (in)	Depth (ft.)	Casing Depth (ft.)	Type of Casing	Normal Yield (GPM)	Capacity (GPM)	Service Status
NRW	1	20	170	112	PVC	1400	1400	ON LINE
NRW	2	20	130	116	PVC	1400	1400	ON LINE
NRW	27	20	130	95	PVC	1400	1400	OFF LINE
NRW	29	20	130	94	PVC	1400	1400	ON LINE
NRW	30	20	121	92	PVC	1400	1400	ON LINE
NRW	31	20	121	92	PVC	1400	1400	ON LINE
NRW	32	20	120	88	PVC	1400	1400	ON LINE
NRW	33	20	121	92	PVC	1400	1400	ON LINE
NRW	45	20	112	94	PVC	1400	1400	ON LINE
NRW	46	20	170	131	PVC	1400	1400	ON LINE

Section 5 - Regional Raw Water Supply

Figure 5-1 Regional Raw Water Service Areas

Source: Broward County Water and Wastewater Services



Section 5 - Regional Raw Water Supply

Table 5-2 SRW Physical Descriptions

Wellfield	Well No.	Size (in)	Depth (ft.)	Casing Depth (ft.)	Type of Casing	Normal Yield (GPM)	Capacity (GPM)	Service Status
SRW	5	20	110	75	PVC	2083	1400	ABANDONED*
SRW	6	20	110	75	PVC	2083	1400	ABANDONED*
SRW	17	12	115	81	PVC	2800	2800	ON LINE
SRW	18	12	140	80	PVC	2800	2800	ON LINE
SRW	19	12	140	80	PVC	2800	2800	ON LINE
SRW	20	12	140	80	PVC	2800	2800	ON LINE
SRW	21	12	140	80	PVC	2800	2800	ON LINE
SRW	22	12	140	80	PVC	2800	2800	ON LINE
SRW	23	12	140	80	PVC	2800	2800	ON LINE
SRW	24	12	140	80	PVC	2800	2800	**OFF LINE

*Abandoned due to saltwater intrusion.

**Out of Service for maintenance.

Source: Broward County Water and Wastewater Services

5.2 North Regional Wellfield

The NRW includes 10, 2-MGD Biscayne aquifer wells and approximately 30,000 linear feet of pipeline, ranging from 12-inches to 48-inches in diameter. A permit application combining the District 2A retail wellfield and NRW permits was approved by the SFWMD and issued in March 2008. The permitted Biscayne aquifer withdrawal capacity of the 2A/NRW is 19.2 MGD on a maximum month basis and 17.5 MGD on an annual average basis. The permit expires in the year 2028. The well casings at the NRW are set in the Biscayne Aquifer at a depth of approximately 100 feet below land surface. The NRW has two emergency generators capable of powering pumps for six wells. Usage data for the NRW are presented in Table 5-3.

Table 5-3 Large User Actual Flow North Regional Raw Water Flow Distribution (1,000 Gallons)

Fiscal Year	Deerfield	Broward County	NRWF
FY 2011	201,111	2,926,030	3,127,141
FY 2012	200,980	2,567,130	2,768,110
FY 2013	204,231	2,295,427	2,499,658
FY 2014	207,310	2,364,710	2,572,020
FY 2015	205,344	2,141,714	2,347,058

Source: Broward County Water and Wastewater Services

5.3 South Regional Wellfield

The SRW includes eight 4-MGD wells, approximately 79,000 linear feet of transmission pipeline, ranging in size from 20-inches to 42-inches in diameter. The SRW has two emergency generators capable of powering pumps for six of the wells (three wells per generator). The remaining wells have connections for a portable generator. The permitted capacity of the SRW is 22.4 MGD on a maximum month basis and 14.2 MGD on an annual average basis. The consumptive use permit expired in October 2007 (and is currently being administratively extended until permit renewal is completed in 2016. Permit reissuance is expected in the normal course of events. Wells 5 and 6 were formerly associated with WTP 3A and were abandoned in 2015. The well casings at the SRW are set in the Biscayne Aquifer at a depth of approximately 100 feet below land surface. Usage data for the SRW are presented in Table 5-4. All wells in the SRW have PVC casings.

Table 5-4 Large User Actual Flow South Regional Raw Water Flow Distribution (1,000 Gallons)

FISCAL YEAR	Hallandale	Hollywood	Dania	FPL	SRWF
FY 2011	1,316,530	1,634,700	590,960	526,280	4,068,470
FY 2012	1,338,773	1,379,070	677,090	506,214	3,901,147
FY 2013	1,270,864	1,449,876	651,827	582,357	3,954,924
FY 2014	1,177,573	1,405,356	632,706	674,546	3,890,181
FY 2015	1,206,252	1,380,709	644,968	526,307	3,758,236

Source: Broward County Water and Wastewater Services

5.4 Contractual Agreements

The contractual agreements with each of the large users are substantially similar. All, except for Hollywood's, do not have an expiration date. The City of Hollywood agreement has a four-year term with an automatic renewal for four years unless otherwise terminated. The large user agreements provide for a method to charge each user a pro rata share of system operations and maintenance costs. Historical and projected revenues for the raw water system are shown in Table 7-6 and generally represent less than one percent of Utility revenues. As noted, the capital costs of system construction were funded using general County revenues.

5.5 Large Users

The North and South Regional Wellfields serve different areas in Broward County. The NRW serves the City of Deerfield Beach and the County's District 2 WTP. The SRW serves the Cities of Dania Beach, Hollywood, and Hallandale Beach, as well as Florida Power and Light.

5.6 Regional Raw Water Supply Regulations

The volume of raw water withdrawal from the Utility's regional raw water supply wellfields is regulated by the SFWMD. Each wellfield is governed by a water use permit that stipulates the raw water annual and maximum month withdrawals. These permits are reissued for periods of five to 20 years. The permit for the combined 2A/NRW was issued in March 2008 for a 20-year period. The application for the renewal of the SRW permit has been filed. The Utility has responded to permit application review comments from the SFWMD and is coordinating with the SFWMD to establish raw water demands based on the Cities of Hollywood, Hallandale Beach and Dania Beach consumptive use permits and the base condition water use for the SRW. The SFWMD has requested additional groundwater modeling information before resolving the outstanding issues. The SRW permit renewal is anticipated to be complete in 2016.

Monitoring of well pumpage, groundwater levels in proximity to wetlands and saltwater intrusion is conducted to comply with specific limiting conditions of the regional wellfield water use permits. For wells that are in service, the County operation personnel regularly monitor pH, alkalinity, hardness, iron, chloride, color, heterotrophic plate count (HPC), coliforms, quarterly wellfield protection monitoring and annual analysis to comply with the SDWA as well as the FDEP. All water quality regulations are enforced by the FDEP. Groundwater levels around the

wellfield footprints and chloride concentrations in the Biscayne aquifer production zone and at depths below production zone also are monitored and reported to the SFWMD on a monthly basis as part of consumptive use permit compliance.

5.7 Visual Inspection and Review

North Regional and South Regional Wellfields

Visual inspections of the County's regional wellfields were performed on by Brown and Caldwell on April 26 and April 27, 2016. The findings of these inspections are summarized below.

North Regional Wellfield

Overall, the NRW appeared to be in good operating condition and in good to very good physical condition. Most wells appeared to have been recently painted, and the vaults and surrounding concrete areas pressure washed as part of annual maintenance. A summary of the observed condition of each well is presented below. One well was offline at the time of the site visit.

- Well 1 Well 1 was generally in good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in good condition. Electrical equipment, including the backup generator serving Wells 1, 2, and 46, was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. The emergency generator building interior and exterior were in very good condition.
- Well 2 Well 2 was generally in good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in excellent condition. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. The vault had some minor concrete spalling on the exterior.
- Well 27 Well 27 was generally in very good condition. The well is currently offline. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in very good condition. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding.
- Well 29 Well 29 was generally in very good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in

Section 5 - Regional Raw Water Supply

very good condition. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding.

- Well 30 Security fencing and locked vaults were intact. The wellhead was generally in excellent condition, and associated piping and valves appeared to be in fair to good condition with minimal corrosion. A small leak was noted on the CARV which should be repaired during routine maintenance. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding.
- Well 31 Well 31 was generally in excellent condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in fair to good condition. A small leak was noted on the CARV which should be repaired during routine maintenance. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding.
- Well 32 Well 32 was generally in good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in good condition. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. The emergency generator building exterior was in very good condition; however, the interior of the building could not be inspected due to access issues.
- Well 33 Well 33 was generally in very good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in good condition. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding.
- Well 45 Well 45 was generally in excellent condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in excellent condition. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. Although minor ponding of water occurs since the vault floor is not sloped towards the sump pit.

Section 5 - Regional Raw Water Supply

Well 46 Well 46 was generally in good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in very good condition. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding.

South Regional Wellfield

The SRW was generally in good condition; however, issues were identified that warrant attention. Well 21 had cracks and fractures in the concrete around the vault door, which should be addressed within a reasonable amount of time. In addition, Well 22 had some grout missing around the door that needs replacement, an approximately 1/16-inch crack along the bottom, and evidence of ants tunneling through the vault walls. A summary of the observed condition of each well is presented below. One well was offline at the time of the site visits.

Well 17 Well 17 was generally in good condition. Security fencing and locked vaults were intact. The piping and valves appeared to be in good condition, with some minor corrosion present. Electrical equipment was in good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. One of the ladder extension arms was missing and needs to be replaced.

Well 18 Well 18 was generally in good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in good condition. Electrical equipment was in good condition, including the backup generator serving this well and two adjacent wells. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. Minor grout repair may be needed in the vicinity of the vault hatch. The interior and exterior of the generator building were in good condition.

Well 19 Well 19 was generally in good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in good condition. Electrical equipment appeared to be in good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. Both of the ladder extension arms were missing and need to be replaced.

Well 20 Well 20 was generally in good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in good

Section 5 - Regional Raw Water Supply

condition. Electrical equipment was in good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. Minor grout repair may be needed in the vicinity of the vault hatch.

- Well 21 Well 21 was generally in good condition, with an issue at the top of the concrete vault that needs to be addressed. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in good condition. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. The vault had cracks and fractures in the concrete around the lid – these should be repaired to limit the potential for water intrusion into the vault.
- Well 22 Well 22 was generally in good to fair condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in good condition, with light corrosion in places. Electrical equipment was in very good condition. The sump pumps appeared to be in operational condition – the well vault showed no obvious evidence of flooding. The vault had some grout missing around the door that needs replacement.
- Well 23 Well 23 was generally in good condition. Security fencing and locked vaults were intact. Associated piping and valves appeared to be in good condition, with light corrosion in places. Electrical equipment was in very good condition. The sump pumps appear to be in operational condition – the well vault showed no obvious evidence of flooding. The vault had some grout missing at the corners near the hatch that needs replacement.
- Well 24 Well 24 was generally in good condition. Security fencing and locked vaults were intact. The wellhead and associated piping and valves appeared to be in good condition. The well had a spool piece removed and was configured to allow sampling. Electrical equipment was in very good condition. The sump pumps appear to be in operational condition – the well vault showed no obvious evidence of flooding. The grading around the vault does not appear to slope away from the vault and areas of severe erosion from well flushing were observed. This should be further investigated, and the area around the well re-graded as required.

Section 6 - Capital Improvement Program

Section 6 Capital Improvement Program

This section includes descriptions of the five-year Capital Improvement Program (CIP) for the Retail Water and Wastewater Systems and the Regional Wastewater and Water Supply Systems.

6.1 Description of the Capital Improvement Program

As part of the growth management efforts mandated by State law, the County initiated planning efforts to accommodate future growth and compliance with regulatory requirements. The latest revision was completed in 2014. The revision completed in 2004 addresses the need for services and facilities based upon anticipated build-out conditions of the service area in the year 2025. It is noted that the Utility conducts an annual CIP review process wherein all projects are thoroughly vetted, estimated and scheduled. Each review builds upon prior analyses and utilizes new planning data when available. Efforts on a new Retail Water and Wastewater Master Plan are currently being performed and are expected to be completed in mid-2016.

As noted, the Utility develops a five-year CIP recognizing costs associated with the condition of the system, future growth and regulatory requirements. Table 6-1 presents the current CIP categorized by expenditure category. The Board approved the CIP for fiscal years 2016 through 2020 in September, 2015. The five-year CIP reflects the total estimated project costs for each project, which is expected to be initiated within the five-year plan regardless of the estimated time required to design and complete construction of the project. Projects remain open until all related construction activities are complete. The budgets by capital project type through fiscal year 2020 are presented in Table 6-2.

Section 6 - Capital Improvement Program

Table 4 Capital Improvement Program as of September 30, 2015

Capital Budgets	Water Treatment	Water and Sewer Mains	Wastewater Treatment	Regional Transmission	Engineering Services & Misc.	Total
Unspent	\$14,396,264	\$55,966,428	\$181,480,846	\$9,950,268	\$6,714,719	\$268,508,525
Prior Budget						
2016	\$8,674,340	\$17,924,350	\$44,962,910	\$6,950,010	\$7,803,580	\$86,315,190
2017	\$3,491,210	\$62,190,040	\$47,500,000	\$5,550,000	\$2,750,000	\$121,481,250
2018	\$3,450,000	\$38,798,090	\$22,608,800	\$10,077,300	\$0	\$74,934,190
2019	\$23,579,320	\$40,224,980	\$58,800,000	\$500,000	\$0	\$123,104,300
2020	\$3,636,000	\$15,890,000	\$800,000	\$500,000	\$0	\$20,826,000
Totals	\$57,227,134	\$230,993,888	\$356,152,556	\$33,527,578	\$17,268,299	\$695,169,455
Five-Year CIP Funding:						
Bonds FY						
2016-2020	\$30,000,000	\$129,300,000	\$125,500,000	\$20,000,000	-	\$304,800,000
Cash FY						
2016-2020 ¹	\$10,000,000	\$48,000,000	\$42,000,000	\$15,000,000	\$19,532,563	\$134,532,563
Beyond						
2020 ²	\$16,202,924	\$55,323,206	\$126,646,353	\$17,831,504	-	\$216,003,987
Totals	\$56,202,924	\$232,623,206	\$294,146,353	\$52,831,504	\$19,532,563	\$655,336,550
<p>¹ Cash reflects net revenues, capital recovery charges, large user contributions, and grants</p> <p>² Reflects effects of construction period. It is currently expected that \$282M of the \$655M program will be spent by 2020. Since the construction period extends beyond 2020, the remaining \$373M will be spent in subsequent years.</p> <p>Source: Broward County Water and Wastewater Services</p>						

Section 6 - Capital Improvement Program

Table 6-2 Capital Projects Budgets by Type Through Fiscal Year 2020	
Water Treatment	Budget
Water Treatment Plant Expansion	\$33,557,610
Water Treatment Plant IRR ¹ & Misc. Projects	\$20,732,780
Energy Efficiency for Retail Facilities	\$2,936,744
Water Treatment Subtotal	\$57,227,134
Water Distribution and Sewer Collection	
Neighborhood Projects (NP & LUP)	\$129,060,546
Misc. Main Improvements	\$39,015,102
Potable Water Storage Improvements	\$39,795,922
Lift Station Improvements	\$23,122,318
Water Distribution and Sewer Collection Subtotal	\$230,993,888
Wastewater Treatment	
NRWWTP Effluent Disposal /Treatment Enhancements	\$171,014,544
Wastewater Plant IRR ¹ & Misc. Projects	\$184,656,072
NRWWTP Ocean Outfall Improvements	\$481,940
Wastewater Treatment Subtotal	\$356,152,556
Regional Transmission	
Master Pump Station Improvements	\$22,908,828
Force Main Extensions/Improvements	\$10,618,750
Regional Transmission Subtotal	\$33,527,578
Engineering/Misc. Services	\$17,268,299
GRAND TOTAL	\$695,169,455
<i>1 IRR = Improvement, Repair and Replacement</i>	
<i>Source: Broward County Water and Wastewater Services</i>	

The estimated funding requirements for this five-year period ending fiscal year 2020 are expected to be met by net revenues, debt proceeds, capital recovery charges, contributions from large users, grants and future borrowings. The Utility currently forecasts cash financing at least 40 percent of the actual funding requirements. Many of the projects and improvements in the CIP are in the planning stages with cost estimates that are preliminary and contracts have not been awarded. The County plans to prioritize projects as needed to maintain an affordable

rate structure. Proposed rates are annually presented to the Board for discussion at an August workshop with action taken at the September budget hearings. Current projections anticipate levelized rate increases of approximately three percent or less annually through fiscal year 2019. The County estimates it will issue approximately \$250 million in bonds in 2019 (the "Series 2019A Bonds").

The County reviews and updates the CIP annually and includes separate estimates for the Water and Wastewater Systems. The total cost of the CIP could vary from these annual estimates depending upon future demands, regulatory requirements, actual contract awards and other economic factors.

6.2 Retail Water and Wastewater System Improvements

The five-year CIP for the retail water and wastewater systems has the principal objectives of: rehabilitating or replacing water distribution systems and extending sanitary sewers to currently unsewered customers. The estimated cost of these improvements totals approximately \$215 million. The Multi-District Inflow and Infiltration Program is continuing with \$5.5 million budgeted for repairs to the wastewater collection system.

6.3 Water Treatment

The five-year CIP includes projects of approximately \$57 million to improve the retail water treatment plants, which includes \$33 million for alternative water supply improvements for Water Treatment Plants 1A and 2A, and \$7 million for improvement, repair and replacement (IRR) of process equipment and security improvements.

6.4 Neighborhood Program

The Neighborhood Program (NP) was initiated by the County in 1993 to upgrade the infrastructure in what were unincorporated neighborhoods. The improvements include upgrades to the existing water and sewer system, installation of drainage, new pavement, swales and landscaping. The final bid pack, Hillsboro Pines is expected to begin construction in early 2016.

6.5 Local Utility Program (LUP)

WWS began implementing local utility improvement projects by Utility Analysis Zones (UAZ) in mid-2009. Where the NP included drainage, landscaping and sidewalk improvements, which were paid for from County general funds, the LUP projects focus solely on water and sanitary sewer improvements. The total cost estimate for these improvements is nearly \$275 million dollars over the next 20 plus years.

6.6 Other Including Mains, Lift Station Improvements and Potable Storage

The CIP includes \$39 million for water and wastewater main improvement projects to address aging water and wastewater lines; increase transmission and distribution capacities, and to extend service to new customers. \$40 million of potable water storage improvements are included for the purpose of replacing existing aging systems and enhancing water storage capacities to meet current and future demands. The CIP also includes \$23 million of retail

wastewater lift station rehabilitation projects to increase the reliability of the wastewater collection system and prevent the occurrence of sanitary sewer overflows.

6.7 Regional Wastewater Treatment

Under current regulations, the Utility is required to reduce the nutrient loadings discharged to the ocean outfall between 2009 and 2025, and to eliminate use of the outfall, except as a back-up discharge that is part of a functioning reuse system after December 31, 2025. These were estimated to result in plant process improvement requirements with estimated costs ranging from \$766 million to \$889 million in accordance with the Effluent Disposal Master Plan. With amendment to the Ocean Outfall legislation in 2013, and the potential of sending reclaimed water to PBC, estimated costs are expected to be substantially reduced to approximately \$170 million. The Utility is in the final stages of negotiating a long-term agreement with Palm Beach County (PBC) to supply bulk reclaimed water to customers in PBC. The agreement was fully executed in April 2016. The County has included approximately \$171 million in the current 5-year CIP to start addressing these improvements to meet the future requirements. Various other system Utility Improvement Repair and Replacement (IRR) projects are budgeted at approximately \$185 million and include digester improvements, grit removal improvements, control center upgrades, general improvements and replacements.

6.8 Regional Wastewater Transmission

The CIP includes a series of master pump station improvements to ensure adequate system capacity and reliability in the regional transmission system. The CIP anticipates investing approximately \$23 million in improvements to the master pumping stations.

Section 7 - Financial Conditions

Section 7 Financial Conditions

This section describes financial operations of the utility; rates, fees and charges; revenue projections; a comparison of utility service costs with other utilities; and adequacy of insurance coverage.

7.1 Overview of Financial Operations

Operating and general maintenance costs of the retail portion of the Utility are recovered through service charges, connection charges and miscellaneous fees and charges. Capital costs for system development, large maintenance projects and renewal and replacement projects are funded through net revenues, bond proceeds, developer contributions, contributions from other municipalities and capital recovery charges.

User charges and fees are developed by WWS and approved by the Broward County Board of County Commissioners. The Board has specific legal authority to fix charges and collect rates, fees and charges from its customers and to acquire, construct, finance and operate the Utility. The existing rate structure for retail customers is based on meter size and consumption. The County, as a matter of policy, on an annual basis reviews revenue requirements and institutes required rate increases. The current retail water and wastewater rates were approved by the Board in September 2015 and became effective October 1, 2015. These rates are presented in Tables 7-1, 7-2 and 7-3. The rate resolutions also address rates for irrigation, reclaimed water, septage and high strength industrial wastewater surcharge, an emergency rate adjustment for water conservation during drought conditions, capital recovery charges per equivalent residential unit (ERU), customer deposits and specific service charges. Capital recovery charges underwrite the investment in additional capacity needed to serve new (additional) customers.

Section 7 - Financial Conditions

Table 7-1 Broward County Water and Sewer Monthly Service Costs for a Residential Customer Using 5,000 Gallons per Month

Fiscal Year	Water Fixed Charge¹	Water Volume Charge	Total Water	% Change From Prev. Year	Sewer Fixed Charge	Sewer Volume Charge	Total Sewer	% Change From Prev. Year	Total Water and Sewer	Total % Change From Prev. Year
2012	14.68	8.89	23.57	3.5%	17.44	16.60	34.04	2.9%	57.61	3.0%
2013	14.89	9.01	23.90	1.4%	17.44	17.15	34.59	1.6%	58.49	1.5%
2014	14.89	9.01	23.90	0.0%	17.44	17.15	34.59	0.0%	58.49	0.0%
2015 ²	15.14	9.34	24.48	2.4%	17.46	18.30	35.76	3.4%	60.24	3.0%
2016 ²	15.54	9.53	25.07	2.4%	18.12	18.70	36.82	3.0%	61.89	2.7%

1 Includes customer charge.

2 Based on rates adopted by the Board effective October 1, 2015.

Source: Broward County Water and Wastewater Services

Section 7 - Financial Conditions

Table 7-2 Broward County Schedule of Retail Rates Minimum Monthly Charges by Customer Class and Meter Size Effective October 1, 2015

Customer Class	Meter Size (inches)	Water (\$)	Wastewater (\$)
Residential Commercial, Municipal and Institutional	5/8" Residential	11.26	18.12
	1" Residential	32.16	42.41
	5/8	18.83	24.50
	1	39.33	66.78
	1 1/2	90.18	135.68
	2	225.68	377.82
	3	496.00	1,121.03
	4	4,178.13	2,169.64
	6	8,545.46	13,333.15
	8	10,259.22	14,451.73
Sale for Resale	4 or less	4,178.13	-
	6	8,545.46	-
	8	10,259.22	-
	10+	56,909.29	-
Multi-Family and Mobile Home (per unit)	All sizes	9.28	14.34
Hotels and Motels (per unit)	All sizes	5.60	11.09
Recreational Vehicles (per unit)	All sizes	6.52	11.38
Private Fire Protection	All Sizes	114	-
Irrigation	5/8	14.34	-
	1	28.64	-
	1 1/2	77.28	-
	2	179.68	-
	3	431.22	-
	4	1,907.96	-
Reclaimed Water (based on 1,000 GPD demand and 20% discount on capital contribution)	All sizes	6.00	-
<i>Source: Broward County Water and Wastewater Services</i>			

Section 7 - Financial Conditions

Table 7-3 Broward County Schedule of Retail Rates Volume Charge (1,000 Gallons) by Customer Class and Meter Size Effective October 1, 2015				
Customer Class (all Meter sizes unless noted)	Water		Wastewater	
	Volume (per 1,000 Gals)	Charge (\$)	Volume (per 1,000 Gals)	Charge (\$)
Residential	0-3	1.47	0 - 15	3.74
	4-6	2.56	Over 15	No Charge
	7-12	6.06		
	Over 12	7.35		
Commercial, Municipal and Institutional	0 - 75% of Avg Consumption	3.67	All Volumes	3.74
	Over 75% of Avg. Consumption	7.35		
Sale for Resale	Water Treatment Charge	2.39	N/A	-
	Water Transmission Charge	0.10	N/A	-
Multi-Family and Mobile Homes (per unit)	0-2	1.47		
	3-4	2.56	0-8	3.74
	5-6	6.06		
	Over 6	7.35	Over 8	No Charge
Hotels and Motels (per unit)	0 - 75% of Avg Consumption	3.67	All Volumes	3.74
	Over 75% of Avg. Consumption	7.35		
Recreational Vehicles (per unit)	0 - 75% of Avg Consumption	3.67	All Volumes	3.74
	Over 75% of Avg. Consumption	7.35		
Private Fire Protection	All Volumes	6.06	N/A	-
Irrigation				
5/8" meter	0-8	6.06	N/A	-
	Over 8	7.35	N/A	-
1" meter	0-22	6.06	N/A	-
	Over 22	7.35	N/A	-
1 1/2" meter	0-55	6.06	N/A	-
	Over 55	7.35	N/A	-
2 to 3" meter	0-142	6.06	N/A	-
	Over 142	7.35	N/A	-
Reclaimed Water	All Volumes	0.07	N/A	-

Source: Broward County Water and Wastewater Services

Since 1994, the average residential use of water decreased from 220 gpd (gallons per day) to 185 gpd. The decrease appeared to be related to ongoing water restrictions and water conservation initiatives of Broward County and the South Florida Water Management District (SFWMD). Further study completed as part of the comprehensive Rate Study completed in fiscal year 2010 has determined that the treatment plant must produce 206 gpd of water to deliver 185 gpd to the average residential customer. Converting this demand to the maximum average daily flow (a factor of 1.33x) yields the requirement of 274 gpd of plant capacity necessary to serve an ERU (equivalent residential unit). Similarly, the ratio of billed water to treated wastewater is 1.13x, which yields the requirement of 209 gpd of wastewater treatment capacity per ERU. The capital recovery charges effective for fiscal year 2015 are \$1,590 and \$2,010 for water and sewer respectively. At the beginning of the Neighborhood Projects, the County adopted the policy of not charging for the first ERU for sewer per customer.

Charges for large users of the NRWWS are defined by the large user agreements, and consist of charges for operation and maintenance costs assessed on the basis of flows, debt service costs assessed on the basis of reserve capacity, and improvement, repair, and replacement fund costs that are assessed as a percentage of other charges. The charges for operation and maintenance costs are adjusted annually to reflect each user's proportionate share of actual costs during the fiscal year.

7.2 Water and Wastewater Rates and Charges

The County has continued to encourage retail customers to conserve water. The County established a rate schedule that sets higher water rates for levels of consumption beyond basic use. As a result of the 2010 Rate Study, an additional rate tier was implemented. The current rate schedule is composed of four tiers:

- Rates for basic use
- Rates for normal use
- Rates for discretionary use
- Rates for excessive use

As noted in Table 7-1, there was a 3% increase in the average monthly residential bill of 5,000 gallons from fiscal year 2015 to fiscal year 2016. Tables 7-2 and 7-3 show the minimum monthly fixed charges and volume charges for all customer classes based upon rates approved by the County which went into effect October 1, 2015. A five-year summary of billing volumes is shown in Table 7-4.

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Table 7-4 Retail Water and Wastewater Billing Volumes as of September 30, 2015
(1,000 Gallons)

Fiscal Year Ended 9/30	Treated Retail	Coconut Creek	Treated Water Total ¹	Wastewater Water ¹
2011	6,885,439	1,731,297	8,616,736	4,891,742
2012	6,695,748	1,643,812	8,339,560	4,872,721
2013	6,579,923	1,699,799	8,279,722	4,496,843
2014	6,694,051	1,754,927	8,448,978	5,165,058
2015	6,949,511	1,789,374	8,738,885	5,372,243

¹ Droughts which began in April 2007 have resulted in reduced water use due to demand management efforts comprising water conservation initiatives, including year round lawn irrigation restrictions. Reduced water use translates to reduced billed wastewater.

Source: Broward County Water and Wastewater Services

In the event additional water restrictions are imposed, the County has instituted an automatic adjustment as noted in Table 7-5 to the water quantities at which increased rates are applied to encourage customers to reduce consumption. The automatic rate adjustment was adopted by the Board as a way to maintain the revenues required for operations while water consumption is curtailed. The SFWMD imposes phased restrictions as drought conditions warrant to achieve targeted reductions of water used.

With the automatic adjustment, the higher water rates established for larger consumption levels are applied at lower levels of consumption. The result is that customers who do conserve as required may experience a reduction in their water bills. Conversely, customers who fail to achieve reductions will pay even greater amounts for water consumed than they would otherwise pay without the adjustment. As targeted reductions increase, the associated levels at which increased rates become effective decrease.

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Table 7-5 Automatic Rate Adjustments for Periods of Mandated Water Restrictions

Customer Class and Block	Restrictions Per Unit Per Month (1,000 gallons)		
	Standard	Drought	Extreme Drought
Single Family (all meter sizes)			
First Tier	0-3	0-2	1
Second Tier	4-6	3-5	2-4
Third Tier	7-12	6-9	5-6
Final Tier	Over 12	Over 9	Over 6
Multi-Family (per unit, all meters)			
First Tier	0-2	1	1
Second Tier	3-4	2-3	2
Third Tier	5-6	4-5	3
Final Tier	Over 6	Over 5	Over 3
Irrigation			
5/8" Meter, First Tier	0-8	0-4	0-2
5/8" Meter, Second Tier	Over 8	Over 4	Over 2
1" Meter, First Tier	0-22	0-11	0-5
1" Meter, Second Tier	Over 22	Over 11	Over 5
1 1/2" Meter, First Tier	0-55	0-27	0-14
1 1/2" Meter, Second Tier	Over 55	Over 27	Over 14
2" and Over Meter, First Tier	0-142	0-71	0-35
2" and Over Meter, Second Tier	Over 142	Over 71	Over 35
Commercial, Municipal, Institutional, Hotels, Motels and Recreational Vehicles			
First Tier	0-75%	0-60%	0-45%
Second Tier	Over 75%	Over 60%	Over 45%

Source: Broward County Water and Wastewater Services

The NRWWS large users' rates are reviewed and adjusted annually by the County as part of the budget process. The rates are based on the County's estimation of total costs and total flows. Debt service requirements (including required coverage) for the NRWWS are allocated to each large user in proportion to their reserved capacity. A surcharge of up to 10% is added to fund improvements, repairs and replacements to the NRWWS. Currently the surcharge is 5%. These funds are maintained separately from the Renewal, Replacement and Improvement Fund established by resolutions of the Board authorizing the issuance of bonds for the Utility (collectively, the "Bond Resolutions") to provide a reserve for the Utility.

Presently, the Renewal, Replacement and Improvement Fund is required by the Bond Resolution to maintain a minimum balance of five percent of the previous year's revenues, as defined by the Bond Resolution, or a greater amount if recommended by the Consulting

Engineer. Five percent of fiscal year 2015 revenues are approximately \$6.6 million. Based on the financial statement for the fiscal year ended September 30, 2015, the 2015 total revenues were \$132,139,000. The current balance in the Renewal, Replacement and Improvement Fund is \$6.2 million. The Consultant recommends that the balance in this fund be increased to at least \$6,606,950 for fiscal year 2016, consistent with the requirement of the Bond Resolution.

7.3 Revenue Projections

Annual water and wastewater revenues and expenditures for fiscal year 2014 are based on actual values from financial statements prepared as of September 30, 2015. Fiscal year 2016 revenues and expenditures have been projected based upon the rates approved by the County, which were implemented October 1, 2015 in conjunction with estimated expenses through fiscal year 2016. Revenues for fiscal years 2016 through 2020 have been based on average annual number of customers, historical average consumption and the retail service rates shown in Table 7-3.

The Utility operates a mature system with limited future growth expected. Growth rates in the retail water and retail wastewater system customer base beginning in fiscal year 2016 have been estimated at one percent annually for water and two percent annually for wastewater. Operation and Maintenance costs are forecast at budgeted levels for fiscal year 2016 and assumed to increase by an average of two percent annually for both water and wastewater beginning in fiscal year 2017. Retail rate increases from fiscal years 2016 through 2020 of approximately three percent or less per year for both retail water and wastewater are necessary to meet the projected revenues as presented in Table 7-6 and Table 7-7. The Board has not yet considered these rate increases. If any retail rate increase is not approved, coverage would be reduced. The revenue forecast for the large users of the NRWWS has been projected to recover costs as defined under the large user agreement.

Table 7-6 shows historical and projected ratios of large user's (regional and resale) revenues to total revenues. Proposed Series 2019A debt service assumes a 5% interest rate per annum and maturities over a 25 year period, back-loaded to support levelized total debt service payments. In fiscal year 2015, the total revenues generated by the Utility were sufficient to meet the bond covenant requirement of 120 percent coverage of all debt service obligations. The audited financial statements at September 30, 2015 present the computation of debt service coverage on all outstanding revenue bonds as 1.75 for fiscal year 2015. In addition, a Balance Available for Renewal, Replacement and Capital Expenditures of approximately \$27.5 million was generated during fiscal year 2015. Table 7-7 presents the Historical and Projected Net Revenue Debt Service and Debt Service Coverage.

An estimate of interest income is projected annually from fiscal year 2016 through fiscal year 2020. Interest income is generated from three main sources: debt service reserve fund, general reserve fund, and investments of fund balances as permitted under the Bond Resolution.

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Table 7-6 Historical and Projected Ratios of Large Users' Revenues and Wastewater Revenues (in 1,000s)										
	Historical					Projected				
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Revenues ¹	116,474	118,221	122,344	123,983	132,139	134,416	138,448	141,209	145,445	149,809
Large User Revenues (Excluding Broward County)	30,660	31,228	32,957	32,413	34,417	36,099	36,039	36,637	37,917	39,901
Percentage Large User to Total Revenues	26.3%	26.4%	26.9%	26.1%	26.0%	26.9%	26.0%	25.9%	26.1%	26.6%
Regional Raw Water Revenues	820	701	876	945	849	883	900	918	936	945
Percentage Regional Raw Water Total Revenues	0.7%	0.6%	0.7%	0.8%	0.6%	0.7%	0.7%	0.7%	0.6%	0.6%
Sale for Resale/Water ²	5,328	5,520	5,740	5,938	6,053	6,100	6,222	6,244	6,368	6,496
Percentage Sale for Resale Revenues to Total Revenues	4.6%	4.7%	4.7%	4.8%	4.6%	4.5%	4.5%	4.4%	4.4%	4.3%
¹ Total Revenues do not include interest earned on the construction account.										
² Principally Sales to City of Coconut Creek										
Source: Broward County Water and Wastewater Services										

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Table 7-7 Schedule of Historical and Projected Net Revenues, Debt Service and Debt Service Coverage (\$1,000)										
	Historical					Projected				
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenues:										
Water	\$ 45,114	\$ 43,458	\$ 43,990	\$ 45,453	\$ 47,796	\$ 48,040	\$ 48,530	\$ 50,481	\$ 52,517	\$ 54,604
Wastewater	64,843	66,249	69,419	70,385	76,159	75,067	77,539	80,279	83,274	86,620
Other ¹	4,947	8,030	8,735	7,869	7,893	9,341	9,626	9,913	10,203	10,506
Interest Income	1,570	793	200	276	291	499	499	499	499	499
Total Revenues	\$116,474	\$118,530	\$122,344	\$123,983	\$132,139	\$132,947	\$136,194	\$141,172	\$146,493	\$152,229
Current Expenses:										
Water Transmission & Distribution	\$ 8,817	\$ 8,811	\$ 9,043	\$ 10,024	\$ 11,258	\$ 11,596	\$ 11,425	\$ 11,654	\$ 11,887	\$ 12,124
Water Source of Supply, Treatment & Pumping	9,184	8,702	8,713	9,060	7,317	7,537	7,426	7,574	7,726	7,880
Wastewater Collection & Transmission	9,866	11,169	11,141	9,200	11,004	11,334	11,167	11,391	11,619	11,851
Wastewater Treatment	14,729	15,324	14,936	15,373	17,321	17,841	17,578	17,930	18,288	18,654
Customer Service	5,400	5,499	4,729	4,765	4,782	4,925	4,853	4,950	5,049	5,150
Administrative/General	15,947	14,568	14,813	14,041	15,203	15,659	15,429	15,737	16,052	16,373
Total Current Expenses	\$ 63,943	\$ 64,073	\$ 63,375	\$ 62,463	\$ 66,885	\$ 68,892	\$ 67,878	\$ 69,236	\$ 70,620	\$ 72,033
Net Revenues	\$ 52,531	\$ 54,457	\$ 58,969	\$ 61,520	\$ 65,254	\$ 64,055	\$ 68,316	\$ 71,936	\$ 75,873	\$ 80,196
Debt Service:										
Senior Lien Debt:										
Series 2003 Bonds	\$ 5,868	\$ 3,459	\$ 1,048							
Series 2003-B Bonds	9,970	9,079	8,188							
Series 2005-A Bonds	3,837	3,147	2,456	\$ 2,457	\$ 1,979					
Series 2009-A Bonds	10,324	10,322	10,325	10,326	8,773	\$ 2,367	\$ 2,363	\$ 2,363	\$ 1,985	\$ 1,984
Series 2012-A Bonds		3,219	8,251	8,252	8,252	8,251	8,253	9,037	8,723	8,725
Series 2012-B Bonds		2,623	5,522	5,523	5,523	5,523	11,058	16,371	16,371	16,370
Series 2012-C Bonds		283	1,706	10,941	10,945	10,940	10,943	4,622	-	-
Series 2015-A Bonds					411	2,113	2,113	2,113	2,113	2,113
Series 2015-B Bonds					1,339	6,885	6,885	6,885	6,885	6,885
Series 2019-A Bonds								7,965	8,095	8,095
Total Debt Service	\$ 29,999	\$ 32,132	\$ 37,496	\$ 37,499	\$ 37,222	\$ 36,079	\$ 36,080	\$ 36,078	\$ 44,042	\$ 44,172
Debt Coverage Senior Lien	1.75	1.69	1.57	1.64	1.75	1.78	1.89	1.99	1.72	1.82

¹ Commencing in fiscal year 2012, other revenues include the customer service charge previously reflected as water revenues.

Source: Broward County Water and Wastewater Services

7.4 Comparison of Utilities Service Costs for Municipalities and the Unincorporated Area in Broward County

Table 7-8 shows the current water and wastewater monthly service charges for residential customers of municipalities and the County, as well as Miami-Dade and Palm Beach Counties.

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Table 7-8 Comparative Rate Survey as of 12/31/2015 (Based On Usage of 5,000 Gallons Per Month for a 5/8" meter)

Utility	Water	Sewer	Total
Davie	36.82	68.66	105.48
Dania Beach	35.00	58.82	93.82
Sunrise (outside City)	46.08	56.30	102.38
Wilton Manors	56.76	46.61	103.37
Oakland Park	45.81	43.53	89.34
Hollywood	26.93	54.27	81.20
Sunrise (inside City)	36.87	45.03	81.90
Parkland	24.31	51.42	75.73
Margate (outside City)	35.55	36.18	71.73
North Lauderdale	30.75	44.99	75.74
Average Water & Sewer for Broward	30.35	39.68	70.03
Coconut Creek	39.08	30.00	69.08
Cooper City	26.47	40.16	66.63
Pompano Beach (outside City)	30.10	32.18	62.28
Tamarac	21.80	42.75	64.55
Hallandale Beach	24.36	34.76	59.12
Miramar	29.03	37.02	66.05
Broward County (WWS)	25.07	36.82	61.89
NSID	36.09	30.28	66.37
Royal Utility	26.68	31.24	57.92
Margate (inside City)	28.45	28.94	57.39
Coral Springs	20.58	39.18	59.76
Deerfield Beach	28.25	24.53	52.78
Plantation	21.29	36.95	58.24
Fort Lauderdale	21.39	35.83	57.22
Lauderhill	20.15	35.31	55.46
CSID	25.01	25.01	50.02
Pompano Beach (inside City)	24.08	25.76	49.84
Pembroke Pines	23.07	26.71	49.78
Water Only			
Hillsboro	34.20		34.20
Sewer Only			
Pembroke Park		53.90	53.90
Lauderdale by the Sea		37.14	37.14
Tri-County Utilities			
Palm Beach County	24.10	26.39	50.49
Miami Dade County	10.12	20.10	30.22

7.5 Insurance Coverage

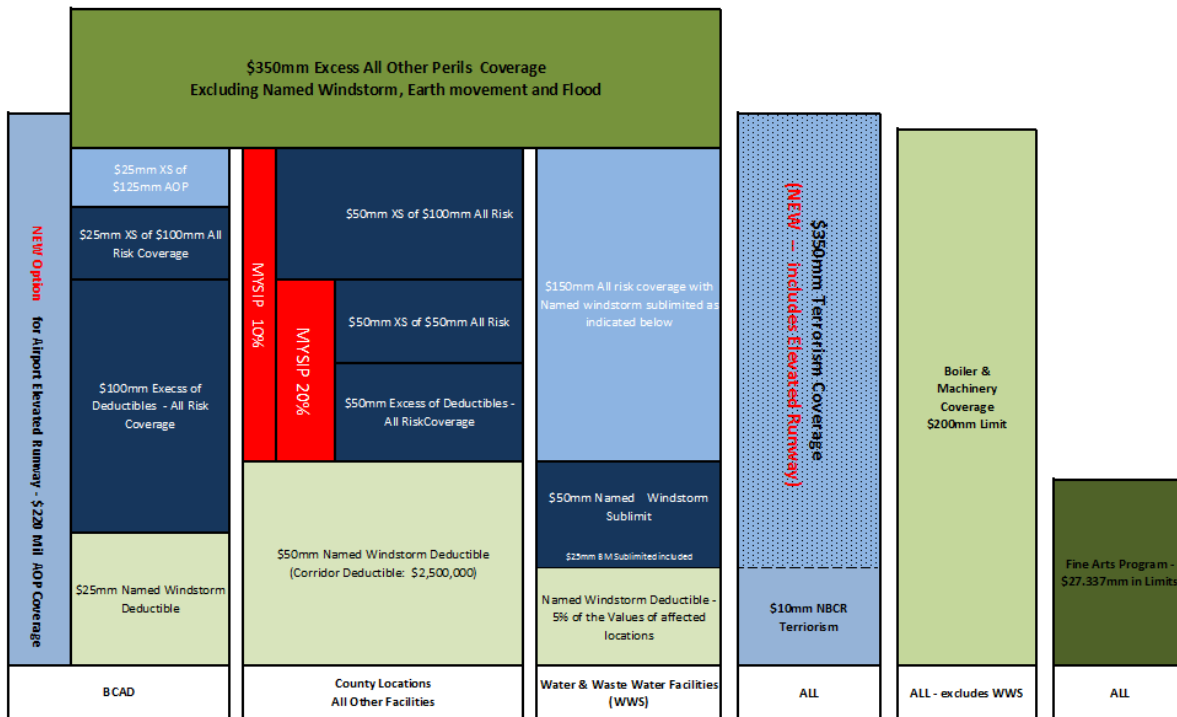
The bond covenants require that customary insurance be carried on the physical assets of the system and coordinates coverage through the County’s Master Property program. The term of the present policy is from February 1, 2015 to February 1, 2016.

Broward County has a fairly large portion of property values located in Special Flood Hazard Areas. The County and Water and Wastewater Services (WWS) have taken steps to mitigate and protect the physical assets so they are more resistant to catastrophic events and flooding.

This year, Broward County continued to provide coverage with a dedicated tower specific to WWS locations that provide comprehensive protection for its physical assets valued over \$510 Million. Coverage is provided through ACE American Insurance Company, an admitted A++ XV carrier rated by AM Best, as their lead carrier providing \$50 Million of Windstorm coverage on a per occurrence basis. The coverage provided through ACE is designed for water utility operations and provides \$25 Million of Equipment Breakdown coverage and \$10 Million of flood coverage including storm surge for physical assets located in Zone X. Physical assets located outside of Zone X – have been identified and individual policies have been written through National Flood Insurance Program (NFIP).

As depicted in Figure 7-1 on the following page, WWS has an independent tower, separate from Aviation (BCAD) and the County (including Port Everglades). Each independent tower represents unique programs so if a catastrophic windstorm event occurs, program limits are not shared. All three towers include additional limits of coverage above each independent tower for a combined program limit of \$500 Million per occurrence for All Other Perils (AOP) limit excluding Windstorm, Earth Movement and Flood).

Figure 7-1 Broward County Insurance Towers



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This year Broward County saved an additional \$2 Million, or 10.25% in premium in comparison to the prior year on their Master Property program. WWS's insured physical assets comprise 10.91% of Broward County's assets. WWS savings portion on their dedicated coverage tower comprised of 4.73% from the prior year with increase in values on their physical assets of 2.3%.

This is in line with Council of Insurance Agents and Brokers¹ first quarter report released April 2015 that showed just over 53.85% experienced reductions between 1-10% and just under 20% experienced flat renewals in the Southeastern United States.

The four major above-ground water and wastewater facilities and their estimated value, as provided by BCWWS, as of June 2015 are as follows:

Table 7-9 Estimated Value of Aboveground Water and Wastewater Facilities	
Facility	FY 2015 Estimated Bldg. Value (\$1,000s)¹
NRWWTP Complex	\$875,500
Water Treatment Plant 2 A	\$ 103,000
Water Treatment Plant 1 A	\$66,950
3 A Repump Station	\$ 15,450
<i>1: Note: Values may not reflect all improvements done at each facility.</i>	

The building values for each facility were based on values provided in previous years' annual reports, increased by three percent. In order to aid in determining insurance coverage needs, it is recommended that a third party evaluation be completed to estimate fair market value, replacement value, and appropriate insured value for each of the County's major assets.

Appendix A

Table A-1
Water and Wastewater Services
Water Production, Wastewater Treatment, and Regional Raw Water (Million Gallons)

	FY-2006	FY-2007	FY-2008	FY-2009	FY-2010	FY-2011	FY-2012	FY-2013	FY-2014	FY-2015
Water Production										
Plant 1A	3,147	2,977	3,059	2,835	2,865	2,635	2,672	2,613	2,608	2,739
Plant 1B	0	0	0	0	0	0	0	0	0	0
Plant 2A	5,568	5,179	4,599	4,571	4,555	4,572	4,259	4,444	4,364	4,588
Plant 3A	0	0	0	0	0	0	0	0	0	0
Plant 3B	0	0	0	0	0	0	0	0	0	0
Plant 3C	0	0	0	0	0	0	0	0	0	0
Broadview	0	0	0	0	0	0	0	0	0	0
Purchased Water From Municipality	2,568	2,608	2,486	2,597	2,203	2,204	2,187	2,390	2,515	2,293
Total Water Production	11,283	10,764	10,143	10,003	9,623	9,411	9,118	9,447	9,487	9,620
Wastewater Treatment										
North Regional WWTP	25,110	24,257	25,156	23,793	23,852	21,762	25,989	24,777	25,276	23,457
WW Flows to Hlwd. Regional Treatment	988	967	1,053	1,162	1,069	958	1,158	1,142	1,308	1,248
Total Wastewater Treatment	26,098	25,224	26,209	24,955	24,921	22,720	27,147	25,919	26,584	24,705
Regional Raw Water										
	6,597	6,795	7,023	6,438	6,374	7,196	6,669	6,455	6,462	6,105
Notes:										
1. Water for 1B and Broadview produced by 1A.										
2. Water for 3B/3C purchased from Hollywood (after October 15, 1996).										
Source: Broward County Water and Wastewater Services										

**Table A-2
Water and Wastewater Services
Average Number of Accounts as of September 30, 2015**

Consumer & Meter Size (inches)	WATER			SEWER		
	Number of Units	Number of Accounts	Average Consumption per Month (1,000 Gallons)	Number of Units	Number of Accounts	Average Consumption per Month (1,000 Gallons)
Residential Single Family						
5/8"	46,231	46,200	238,900	41,304	41,277	220,729
1"	1,795	1,769	27,239	2,469	2,446	35,056
1 1/2"	137	70	1,983	178	178	7,534
2"	2	2	692	31	31	1,443
TPK Residential Single Family						
5/8"	34	17	44	30	13	40
1 1/2"	69	2	156	36	1	24
2"	171	2	208	275	1	1,249
Residential Multi-Family, Hotel & RVs	33,674	2,057	126,947	32,860	1,892	124,397
Commercial						
5/8"	2,738	2,731	12,539	1,959	1,953	9,966
1"	1,578	1,426	17,086	797	797	13,338
1 1/2"	704	702	28,802	568	566	19,667
2"	848	627	54,655	462	462	47,031
3"	168	69	7,054	15	15	4,248
4"	10	10	19,410	8	8	5,676
6"	7	7	9,982	1	1	946
Irrigation						
5/8"	285	285	2,319	2	2	0
1"	285	285	5,519	-	-	-
1 1/2"	201	201	9,885	-	-	-
2"	125	125	15,707	-	-	-
Sale for Resale						
10"	4	4	149,115	-	-	-
TOTAL	89,066	56,591	728,241	80,995	49,643	491,343

Source: Broward County Water and Wastewater Services

**Table A-3
Water and Wastewater Services
Retail Water & Wastewater Customer Average Monthly Demand & Revenues
As of September 30, 2015**

Revenue Class	Water			Wastewater		
	Demand	Revenue		Demand	Revenue	
	Total 1,000 Gal	\$ Total	\$ Per 1,000 Gal	Total 1,000 Gal	\$ Total	\$ Per 1,000 Gal
Residential Single Family	269,222	1,417,294	5.26	228,159	1,634,135	7.16
Residential Multi Family	113,029	591,215	5.23	105,300	765,484	7.27
Commercial	163,446	1,203,198	7.36	114,228	845,774	7.40
Sale for Resale	149,115	511,171	3.43	N/A	N/A	N/A
Irrigation	33,429	271,556	8.12	N/A	N/A	N/A
Total	728,241	3,994,433	5.49	447,687	3,245,394	7.25

Source: Broward County Water and Wastewater Services

Table A-4
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
RETAIL WATER

Retail Water	Activities				Total Water
	Wellfields	Treatment	Purchased Water	Distribution	
PERSONAL SERVICES	\$ 42,709	\$ 2,940,397	\$ -	\$ 1,645,083	\$ 4,628,189
OPERATING MATERIAL	11,384	504,968	-	639,043	1,155,395
OTHER MATERIAL	-	16,376	-	2,999	19,375
UTILITIES-OTHER	-	654	-	52,128	52,782
ELECTRIC	57,737	833,977	-	350,463	1,242,177
TREAT/TRANS	-	-	-	-	-
PURCHASED WATER	-	-	6,151,622	-	6,151,622
RENTAL/LEASES	-	692	-	665	1,357
MOTOR POOL	-	188,299	-	79,247	267,547
CONTRACT SERVICE	27,066	437,109	-	657,846	1,122,022
OTHER	206,793	(163,980)	-	348,747	391,560
EDUCATIONAL COURSES	-	11,765	-	6,908	18,673
COMPUTER MAINTENANCE	-	-	-	-	-
TRAVEL	-	-	-	-	-
OTHER CHEMICALS	-	942,078	-	35,128	977,206
CHEMICALS CHLORINE	-	7,276	-	3,472	10,748
CHEMICALS LIME	-	1,247,180	-	-	1,247,180
SUBTOTAL	345,689	6,966,791	6,151,622	3,821,729	17,285,832
<u>OPERATING COST RECLASS:</u>					
ONE CALL	-	-	-	74,802	74,802
PAINT SHOP	-	20,766	-	-	20,766
HEAVY EQUIPMENT	-	-	-	136,631	136,631
SUBTOTAL	-	20,766	-	211,433	232,199
<u>ALLOCATE:</u>					
SECTION ADMIN.	(500)	(9,736)	-	(3,451)	(13,686)
DIVISION ADMINISTRATION	24,498	493,711	435,943	270,832	1,224,983
SUBTOTAL DIRECT OVERHEAD	23,998	483,975	435,943	267,381	1,211,297
TOTAL	\$ 369,687	\$ 7,471,532	\$ 6,587,565	\$ 4,300,544	\$ 18,729,327

Source: Broward County Water and Wastewater Services

Table A-4.1
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
RETAIL WATER - WELLFIELDS DETAIL

ACTIVITY - Retail Wellfields	District One			District Two			Total		
	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M
PERSONAL SERVICES	\$ -	\$ 10,546	\$ 10,546	\$ -	\$ 32,162	\$ 32,162	\$ -	\$ 42,709	\$ 42,709
OPERATING MATERIAL	-	6,400	6,400	-	4,985	4,985	-	11,384	11,384
OTHER MATERIAL	-	-	-	-	-	-	-	-	-
UTILITIES-OTHER	-	-	-	-	-	-	-	-	-
ELECTRIC	-	-	-	57,737	-	57,737	57,737	-	57,737
TREAT/TRANS	-	-	-	-	-	-	-	-	-
PURCHASED WATER	-	-	-	-	-	-	-	-	-
RENTAL/LEASES	-	-	-	-	-	-	-	-	-
MOTOR POOL	-	-	-	-	-	-	-	-	-
CONTRACT SERVICE	-	26,241	26,241	-	825	825	-	27,066	27,066
OTHER	90,000	5,501	95,501	110,000	1,292	111,292	200,000	6,793	206,793
EDUCATIONAL COURSES	-	-	-	-	-	-	-	-	-
COMPUTER MAINTENANCE	-	-	-	-	-	-	-	-	-
TRAVEL	-	-	-	-	-	-	-	-	-
OTHER CHEMICALS	-	-	-	-	-	-	-	-	-
CHEMICALS CHLORINE	-	-	-	-	-	-	-	-	-
CHEMICALS LIME	-	-	-	-	-	-	-	-	-
SUBTOTAL	90,000	48,688	138,688	167,737	39,263	207,001	257,737	87,952	345,689
<u>OPERATING COST RECLASS:</u>									
ONE CALL	-	-	-	-	-	-	-	-	-
PAINT SHOP	-	-	-	-	-	-	-	-	-
HEAVY EQUIPMENT	-	-	-	-	-	-	-	-	-
SUBTOTAL	-	-	-	-	-	-	-	-	-
<u>ALLOCATE:</u>									
SECTION ADMIN.	(88)	(48)	(135)	(295)	(69)	(364)	(383)	(117)	(500)
DIVISION ADMINISTRATION	6,378	3,450	9,828	11,887	2,782	14,669	18,265	6,233	24,498
SUBTOTAL DIRECT OVERHEAD	6,290	3,403	9,693	11,592	2,713	14,305	17,882	6,116	23,998
TOTAL	\$ 96,290	\$ 52,091	\$ 148,381	\$ 179,329	\$ 41,977	\$ 221,306	\$ 275,619	\$ 94,068	\$ 369,687

Source: Broward County Water and Wastewater Services

Table A-4.2
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
RETAIL WATER - WATER TREATMENT DETAIL

ACTIVITY - Retail Water Treatment	WTP 1-A			WTP 2-A			Total Treatment			ACTIVITY - Purchased Water
	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M	
PERSONAL SERVICES	\$ 875,730	\$ 612,297	\$ 1,488,028	\$ 800,890	\$ 651,480	\$ 1,452,370	\$ 1,676,620	\$ 1,263,777	\$ 2,940,397	\$ -
OPERATING MATERIAL	19,880	242,583	262,464	3,218	239,286	242,504	23,099	481,869	504,968	-
OTHER MATERIAL	11,521	843	12,364	-	4,012	4,012	11,521	4,855	16,376	-
UTILITIES-OTHER	654	-	654	-	-	-	654	-	654	-
ELECTRIC	365,590	-	365,590	468,387	-	468,387	833,977	-	833,977	-
TREAT/TRANS	-	-	-	-	-	-	-	-	-	-
PURCHASED WATER	-	-	-	-	-	-	-	-	-	6,151,622
RENTAL/LEASES	216	346	562	130	-	130	347	346	692	-
MOTOR POOL	59,789	45,539	105,328	58,484	24,488	82,972	118,272	70,027	188,299	-
CONTRACT SERVICE	51,101	185,330	236,431	47,642	153,037	200,678	98,742	338,367	437,109	-
OTHER	12,182	(173,838)	(161,656)	9,130	(11,454)	(2,324)	21,312	(185,292)	(163,980)	-
EDUCATIONAL COURSES	2,841	3,097	5,938	2,610	3,217	5,827	5,450	6,314	11,765	-
COMPUTER MAINTENANCE	-	-	-	-	-	-	-	-	-	-
TRAVEL	-	-	-	-	-	-	-	-	-	-
OTHER CHEMICALS	448,695	-	448,695	493,383	-	493,383	942,078	-	942,078	-
CHEMICALS CHLORINE	6,791	-	6,791	485	-	485	7,276	-	7,276	-
CHEMICALS LIME	452,980	-	452,980	793,935	266	794,200	1,246,914	266	1,247,180	-
SUBTOTAL	2,307,969	916,198	3,224,167	2,678,293	1,064,331	3,742,624	4,986,262	1,980,529	6,966,791	6,151,622
OPERATING COST RECLASS:										
ONE CALL	-	-	-	-	-	-	-	-	-	-
PAINT SHOP	-	7,244	7,244	-	13,522	13,522	-	20,766	20,766	-
HEAVY EQUIPMENT	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	-	7,244	7,244	-	13,522	13,522	-	20,766	20,766	-
ALLOCATE:										
SECTION ADMIN.	(2,252)	(894)	(3,147)	(4,715)	(1,874)	(6,589)	(6,968)	(2,768)	(9,736)	-
DIVISION ADMINISTRATION	163,557	64,928	228,485	189,801	75,425	265,226	353,358	140,353	493,711	435,943
SUBTOTAL DIRECT OVERHEAD	161,305	64,033	225,338	185,085	73,551	258,637	346,390	137,585	483,975	435,943
TOTAL	\$ 2,469,274	\$ 987,475	\$ 3,456,749	\$ 2,863,379	\$ 1,151,404	\$ 4,014,783	\$ 5,332,653	\$ 2,138,879	\$ 7,471,532	\$ 6,587,565

Source: Broward County Water and Wastewater Services

Table A-4.3
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
RETAIL WATER - DISTRIBUTION DETAIL

ACTIVITY - Distribution	District One			District Two			District Three			Total Distribution		
	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M	Operations*	Maintenance	Total O & M	Operations	Maintenance	Total O & M
PERSONAL SERVICES	\$ -	\$ 332,993	\$ 332,993	\$ -	\$ 244,590	\$ 244,590	\$ 598,281	\$ 469,218	\$ 1,067,500	\$ 598,281	\$ 1,046,802	\$ 1,645,083
OPERATING MATERIAL	-	129,470	129,470	-	64,631	64,631	312,518	132,424	444,942	312,518	326,525	639,043
OTHER MATERIAL	-	-	-	-	-	-	2,999	-	2,999	2,999	-	2,999
UTILITIES-OTHER	-	-	-	-	-	-	52,128	-	52,128	52,128	-	52,128
ELECTRIC	145,977	-	145,977	-	-	-	204,486	-	204,486	350,463	-	350,463
TREAT/TRANS	-	-	-	-	-	-	-	-	-	-	-	-
PURCHASED WATER	-	-	-	-	-	-	-	-	-	-	-	-
RENTAL/LEASES	-	-	-	-	-	-	665	-	665	665	-	665
MOTOR POOL	-	-	-	-	-	-	79,247	-	79,247	79,247	-	79,247
CONTRACT SERVICE	-	407,247	407,247	-	63,144	63,144	8,697	178,759	187,455	8,697	649,150	657,846
OTHER	-	204,311	204,311	-	149,080	149,080	(300,258)	295,614	(4,644)	(300,258)	649,005	348,747
EDUCATIONAL COURSES	-	-	-	-	-	-	6,908	-	6,908	6,908	-	6,908
COMPUTER MAINTENANCE	-	-	-	-	-	-	-	-	-	-	-	-
TRAVEL	-	-	-	-	-	-	-	-	-	-	-	-
OTHER CHEMICALS	-	-	-	-	-	-	35,128	-	35,128	35,128	-	35,128
CHEMICALS CHLORINE	-	-	-	-	-	-	3,472	-	3,472	3,472	-	3,472
CHEMICALS LIME	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	145,977	1,074,022	1,219,999	-	521,445	521,445	1,004,271	1,076,015	2,080,286	1,150,248	2,671,481	3,821,729
OPERATING COST RECLASS:												
ONE CALL	25,847	-	25,847	26,175	-	26,175	22,780	-	22,780	74,802	-	74,802
PAINT SHOP	-	-	-	-	-	-	-	-	-	-	-	-
HEAVY EQUIPMENT	-	65,967	65,967	-	42,969	42,969	-	27,695	27,695	-	136,631	136,631
SUBTOTAL	25,847	65,967	91,814	26,175	42,969	69,144	22,780	27,695	50,475	74,802	136,631	211,433
ALLOCATE:												
SECTION ADMIN.	(142)	(1,048)	(1,191)	-	(918)	(918)	(292)	(1,050)	(1,342)	(434)	(3,016)	(3,451)
DIVISION ADMINISTRATION	10,345	76,112	86,457	-	36,953	36,953	71,169	76,253	147,422	81,514	189,318	270,832
SUBTOTAL DIRECT OVERHEAD	10,202	75,064	85,266	-	36,035	36,035	70,877	75,203	146,080	81,080	186,302	267,381
TOTAL	\$ 182,026	\$ 1,215,052	\$ 1,397,079	\$ 26,175	\$ 600,448	\$ 626,623	\$ 1,097,928	\$ 1,178,913	\$ 2,276,842	\$ 1,306,130	\$ 2,994,414	\$ 4,300,544

Notes:
* Includes underground

Source: Broward County Water and Wastewater Services

Table A-4.4
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
RETAIL WASTEWATER

Retail Wastewater	Activities		
	Collection	Lift Stations	Total Wastewater
PERSONAL SERVICES	\$ 706,209	\$ 1,422,505	\$ 2,128,713
OPERATING MATERIAL	275,030	1,174,181	1,449,211
OTHER MATERIAL	1,157	3,202	4,359
UTILITIES-OTHER	2,869,205	4,901	2,874,106
ELECTRIC	1,570	448,174	449,744
TREAT/TRANS	-	-	-
PURCHASED WATER	-	-	-
RENTAL/LEASES	-	452	452
MOTOR POOL	111,554	204,853	316,406
CONTRACT SERVICE	42,750	398,426	441,176
OTHER	31,043	(14,049)	16,994
EDUCATIONAL COURSES	-	-	-
COMPUTER MAINTENANCE	4,161	13,509	17,669
TRAVEL	-	-	-
OTHER CHEMICALS	-	-	-
CHEMICALS CHLORINE	-	-	-
CHEMICALS LIME	-	-	-
SUBTOTAL	4,042,677	3,656,152	7,698,830
<u>OPERATING COST RECLASS:</u>			
ONE CALL	41,179	-	41,179
PAINT SHOP	-	20,283	20,283
HEAVY EQUIPMENT	-	70,143	70,143
GENERATORS	-	224,570	224,570
SUBTOTAL	41,179	314,996	356,175
<u>ALLOCATE:</u>			
SECTION ADMIN.	(3,596)	(4,299)	(7,895)
DIVISION ADMINISTRATION	286,490	259,098	545,588
SUBTOTAL DIRECT OVERHEAD	282,893	254,799	537,692
TOTAL	\$ 4,366,750	\$ 4,225,947	\$ 8,592,697

Source: Broward County Water and Wastewater Services

Table A-4.5
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
RETAIL WASTEWATER - COLLECTION DETAIL

ACTIVITY - Collection	District One			District Two			District Three			Total Collection		
	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M	Operations*	Maintenance	Total O & M	Operations	Maintenance	Total O & M
PERSONAL SERVICES	\$ -	\$ 98,965	\$ 98,965	\$ -	\$ 130,519	\$ 130,519	\$ 421,114	\$ 55,611	\$ 476,725	\$ 421,114	\$ 285,094	\$ 706,209
OPERATING MATERIAL	-	21,859	21,859	-	15,937	15,937	229,650	7,583	237,233	229,650	45,379	275,030
OTHER MATERIAL	-	-	-	-	-	-	1,157	-	1,157	1,157	-	1,157
UTILITIES-OTHER	-	-	-	-	-	-	2,869,205	-	2,869,205	2,869,205	-	2,869,205
ELECTRIC	-	-	-	1,570	-	1,570	-	-	-	1,570	-	1,570
TREAT/TRANS	-	-	-	-	-	-	-	-	-	-	-	-
PURCHASED WATER	-	-	-	-	-	-	-	-	-	-	-	-
RENTAL/LEASES	-	-	-	-	-	-	-	-	-	-	-	-
MOTOR POOL	-	-	-	-	-	-	111,554	-	111,554	111,554	-	111,554
CONTRACT SERVICE	-	17,440	17,440	-	14,199	14,199	8,694	2,417	11,111	8,694	34,056	42,750
OTHER	-	87,581	87,581	-	82,379	82,379	(222,119)	83,202	(138,917)	(222,119)	253,162	31,043
EDUCATIONAL COURSES	-	-	-	-	-	-	-	-	-	-	-	-
COMPUTER MAINTENANCE	-	-	-	-	-	-	4,161	-	4,161	4,161	-	4,161
TRAVEL	-	-	-	-	-	-	-	-	-	-	-	-
OTHER CHEMICALS	-	-	-	-	-	-	-	-	-	-	-	-
CHEMICALS CHLORINE	-	-	-	-	-	-	-	-	-	-	-	-
CHEMICALS LIME	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	-	225,845	225,845	1,570	243,034	244,604	3,423,415	148,813	3,572,228	3,424,986	617,692	4,042,677
ALLOCATE:												
SECTION ADMIN.	-	(220)	(220)	(3)	(428)	(431)	(2,800)	(145)	(2,945)	(2,803)	(794)	(3,596)
DIVISION ADMINISTRATION	-	16,005	16,005	111	17,223	17,334	242,605	10,546	253,151	242,716	43,774	286,490
ONE CALL	16,209	-	16,209	16,428	-	16,428	8,543	-	8,543	41,179	-	41,179
PAINT SHOP	-	-	-	-	-	-	-	-	-	-	-	-
HEAVY EQUIPMENT	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL DIRECT OVERHEAD	16,209	15,784	31,993	16,536	16,795	33,332	248,347	10,401	258,748	281,093	42,980	324,073
TOTAL	\$ 16,209	\$ 241,629	\$ 257,838	\$ 18,107	\$ 259,829	\$ 277,936	\$ 3,671,763	\$ 159,214	\$ 3,830,976	\$ 3,706,079	\$ 660,672	\$ 4,366,750

Notes:
* Includes underground

Source: Broward County Water and Wastewater Services

Table A-4.6
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
RETAIL WASTEWATER - LIFT STATIONS DETAIL

ACTIVITY - Lift Stations	District One			District Two			District Three			Field Support	Total Lift Stations		
	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M		Operations	Maintenance	Total O & M
PERSONAL SERVICES	\$ -	\$ 208,660	\$ 208,660	\$ -	\$ 382,634	\$ 382,634	\$ -	\$ 217,752	\$ 217,752	\$ 613,458	\$ 613,458	\$ 809,046	\$ 1,422,505
OPERATING MATERIAL	-	441,564	441,564	-	533,499	533,499	-	178,809	178,809	20,309	20,309	1,153,872	1,174,181
OTHER MATERIAL	-	-	-	-	-	-	-	-	-	3,202	3,202	-	3,202
UTILITIES-OTHER	2,557	-	2,557	2,344	-	2,344	-	-	-	-	4,901	-	4,901
ELECTRIC	168,592	-	168,592	171,983	-	171,983	107,506	-	107,506	93	448,174	-	448,174
TREAT/TRANS	-	-	-	-	-	-	-	-	-	-	-	-	-
PURCHASED WATER	-	-	-	-	-	-	-	-	-	-	-	-	-
RENTAL/LEASES	-	-	-	-	-	-	-	-	-	452	452	-	452
MOTOR POOL	-	-	-	-	-	-	-	-	-	204,853	204,853	-	204,853
CONTRACT SERVICE	-	122,038	122,038	4,900	124,635	129,535	-	119,454	119,454	27,399	32,299	366,127	398,426
OTHER	23	126,601	126,624	50	206,219	206,269	111	138,407	138,518	(485,460)	(485,276)	471,227	(14,049)
EDUCATIONAL COURSES	-	-	-	-	-	-	-	-	-	-	-	-	-
COMPUTER MAINTENANCE	-	-	-	-	-	-	-	-	-	13,509	13,509	-	13,509
TRAVEL	-	-	-	-	-	-	-	-	-	-	-	-	-
OTHER CHEMICALS	-	-	-	-	-	-	-	-	-	-	-	-	-
CHEMICALS CHLORINE	-	-	-	-	-	-	-	-	-	-	-	-	-
CHEMICALS LIME	-	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	171,171	898,864	1,070,035	179,277	1,246,987	1,426,264	107,617	654,422	762,039	397,815	855,880	2,800,273	3,656,152
ALLOCATE:													
SECTION ADMIN.	(167)	(877)	(1,044)	(316)	(2,195)	(2,511)	(105)	(639)	(744)	-	(588)	(3,711)	(4,299)
DIVISION ADMINISTRATION	12,130	63,699	75,829	12,705	88,369	101,074	7,626	46,376	54,003	28,192	60,653	198,445	259,098
ONE CALL	-	-	-	-	-	-	-	-	-	-	-	-	-
PAINT SHOP	-	6,761	6,761	-	6,761	6,761	-	6,761	6,761	-	-	20,283	20,283
HEAVY EQUIPMENT	-	26,894	26,894	-	23,754	23,754	-	19,494	19,494	-	-	70,143	70,143
GENERATORS	68,868	-	68,868	96,815	-	96,815	58,887	-	58,887	-	224,570	-	224,570
SUBTOTAL DIRECT OVERHEAD	11,963	96,477	108,441	12,389	116,689	129,078	7,521	71,992	79,514	28,192	60,065	285,159	345,224
TOTAL	\$ 183,135	\$ 995,341	\$ 1,178,476	\$ 191,666	\$ 1,363,676	\$ 1,555,342	\$ 115,138	\$ 726,414	\$ 841,553	\$ 426,007	\$ 915,945	\$ 3,085,432	\$ 4,001,377

Source: Broward County Water and Wastewater Services

Table A-4.7
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
WHOLESALE RAW WATER

Wholesale Raw Water	North System			South System			Total		
	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M
PERSONAL SERVICES	\$ -	\$ 30,295	\$ 30,295	\$ -	\$ 47,614	\$ 47,614	\$ -	\$ 77,909	\$ 77,909
OPERATING MATERIAL	-	3,964	3,964	-	110,971	110,971	-	114,935	114,935
OTHER MATERIAL	-	-	-	-	-	-	-	-	-
UTILITIES-OTHER	-	-	-	-	-	-	-	-	-
ELECTRIC	112,765	-	112,765	318,091	-	318,091	430,856	-	430,856
TREAT/TRANS	-	-	-	-	-	-	-	-	-
PURCHASED WATER	-	-	-	-	-	-	-	-	-
RENTAL/LEASES	-	-	-	-	-	-	-	-	-
MOTOR POOL	-	-	-	-	-	-	-	-	-
CONTRACT SERVICE	-	3,691	3,691	20,050	-	20,050	20,050	3,691	23,741
OTHER	100,000	1,685	101,685	100,000	23,962	123,962	200,000	25,646	225,646
EDUCATIONAL COURSES	-	-	-	-	-	-	-	-	-
COMPUTER MAINTENANCE	-	-	-	-	-	-	-	-	-
TRAVEL	-	-	-	-	-	-	-	-	-
OTHER CHEMICALS	-	-	-	-	-	-	-	-	-
CHEMICALS CHLORINE	-	-	-	-	-	-	-	-	-
CHEMICALS LIME	-	-	-	-	-	-	-	-	-
SUBTOTAL	212,765	39,634	252,399	438,141	182,546	620,687	650,906	222,181	873,087
OPERATING COST RECLASS:									
ONE CALL	1,150	-	1,150	1,150	-	1,150	2,300	-	2,300
PAINT SHOP	-	-	-	-	-	-	-	-	-
HEAVY EQUIPMENT	-	2,204	2,204	-	-	-	-	2,204	2,204
SUBTOTAL	1,150	2,204	3,354	1,150	-	1,150	2,300	2,204	4,504
ALLOCATE:									
SECTION ADMIN.	(375)	(70)	(444)	(428)	(178)	(606)	(802)	(248)	(1,050)
DIVISION ADMINISTRATION	15,078	2,809	17,887	31,049	12,936	43,986	46,127	15,745	61,872
SUBTOTAL DIRECT OVERHEAD	14,703	2,739	17,442	30,622	12,758	43,380	45,325	15,497	60,822
TOTAL	\$ 228,618	\$ 44,578	\$ 273,195	\$ 469,913	\$ 195,305	\$ 665,217	\$ 698,531	\$ 239,882	\$ 938,413

Source: Broward County Water and Wastewater Services

Table A-4.8
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
WHOLESALE WASTEWATER TREATMENT

Wholesale Wastewater Treatment	Solids			Liquids			Reuse			Total Plant			Other*	Total Treatment
	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M	Operations	Maintenance	Total O & M		
PERSONAL SERVICES	\$ 3,671,028	\$ 190,259	\$ 3,861,287	\$ -	\$ 76,693	\$ 76,693	\$ -	\$ 47,451	\$ 47,451	\$ 3,671,028	\$ 314,402	\$ 3,985,430	\$ 989,114	\$ 4,974,544
OPERATING MATERIAL	815,963	295,882	1,111,845	-	94,828	94,828	-	65,346	65,346	815,963	456,056	1,272,020	30,280	1,302,300
OTHER MATERIAL	23,392	-	23,392	-	-	-	-	-	-	23,392	-	23,392	8,168	31,560
UTILITIES-OTHER	213,218	-	213,218	361	-	361	-	-	-	213,579	-	213,579	3,813	217,392
ELECTRIC	3,371,676	-	3,371,676	-	-	-	-	-	-	3,371,676	-	3,371,676	-	3,371,676
TREAT/TRANS	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PURCHASED WATER	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RENTAL/LEASES	19,600	-	19,600	-	-	-	-	-	-	19,600	-	19,600	368	19,968
MOTOR POOL	213,351	-	213,351	-	-	-	-	-	-	213,351	-	213,351	16,061	229,412
CONTRACT SERVICE	3,882,796	17,840	3,900,637	-	102,864	102,864	-	14,018	14,018	3,882,796	134,723	4,017,519	32,212	4,049,730
OTHER	111,955	15,384	127,339	-	3,429	3,429	-	6,443	6,443	111,955	25,256	137,211	77,294	214,505
EDUCATIONAL COURSES	14,940	-	14,940	-	-	-	-	-	-	14,940	-	14,940	-	14,940
COMPUTER MAINTENANCE	-	-	-	-	-	-	-	-	-	-	-	-	4,428	4,428
TRAVEL	792	-	792	-	-	-	-	-	-	792	-	792	-	792
OTHER CHEMICALS	891,389	-	891,389	-	-	-	-	-	-	891,389	-	891,389	-	891,389
CHEMICALS CHLORINE	98,618	-	98,618	-	-	-	-	-	-	98,618	-	98,618	595	99,213
CHEMICALS LIME	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	13,328,720	519,365	13,848,085	361	277,814	278,175	-	133,258	133,258	13,329,081	930,437	14,259,518	1,162,332	15,421,850
OPERATING COST RECLASS:														
ONE CALL	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAINT SHOP	-	7,244	7,244	-	-	-	-	-	-	-	7,244	7,244	-	7,244
HEAVY EQUIPMENT	-	-	-	-	-	-	-	-	-	-	-	-	31,743	31,743
SUBTOTAL	-	7,244	7,244	-	-	-	-	-	-	-	7,244	7,244	31,743	38,987
ALLOCATE:														
SECTION ADMIN.	13,903	542	14,445	0	290	290	-	139	139	13,904	971	14,874	7	14,881
DIVISION ADMINISTRATION	944,557	36,805	981,363	26	19,688	19,713	-	9,443	9,443	944,583	65,937	1,010,519	82,370	1,092,890
SUBTOTAL DIRECT OVERHEAD	958,460	37,347	995,808	26	19,977	20,003	-	9,582	9,582	958,486	66,907	1,025,394	82,377	1,107,771
TOTAL	\$ 14,287,180	\$ 563,956	\$ 14,851,136	\$ 387	\$ 297,792	\$ 298,179	\$ -	\$ 142,840	\$ 142,840	\$ 14,287,567	\$ 1,004,588	\$ 15,292,155	\$ 1,276,453	\$ 16,568,608

Notes:
* Other - details provided in Table A-4.9

Source: Broward County Water and Wastewater Services

Table A-4.9
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
WHOLESALE WASTEWATER TREATMENT - OTHER DETAIL

Wholesale Wastewater Treatment - Other Detail	Reuse Distribution			Compliance and Monitoring & Septage	Total Other
	Operations	Maintenance	Total O & M		
PERSONAL SERVICES	\$ -	\$ 4,023	\$ 4,023	\$ 985,091	\$ 989,114
OPERATING MATERIAL	-	2,170	2,170	28,110	30,280
OTHER MATERIAL	-	-	-	8,168	8,168
UTILITIES-OTHER	-	-	-	3,813	3,813
ELECTRIC	-	-	-	-	-
TREAT/TRANS	-	-	-	-	-
PURCHASED WATER	-	-	-	-	-
RENTAL/LEASES	-	-	-	368	368
MOTOR POOL	-	-	-	16,061	16,061
CONTRACT SERVICE	-	-	-	32,212	32,212
OTHER	-	369	369	76,925	77,294
EDUCATIONAL COURSES	-	-	-	-	-
COMPUTER MAINTENANCE	-	-	-	4,428	4,428
TRAVEL	-	-	-	-	-
OTHER CHEMICALS	-	-	-	-	-
CHEMICALS CHLORINE	-	-	-	595	595
CHEMICALS LIME	-	-	-	-	-
SUBTOTAL	-	6,561	6,561	1,155,771	1,162,332
<u>OPERATING COST RECLASS:</u>					
ONE CALL	-	-	-	-	-
PAINT SHOP	-	-	-	-	-
HEAVY EQUIPMENT	-	31,743	31,743	-	31,743
SUBTOTAL	-	31,743	31,743	-	31,743
<u>ALLOCATE:</u>					
SECTION ADMIN.	-	7	7	-	7
DIVISION ADMINISTRATION	-	465	465	81,905	82,370
SUBTOTAL DIRECT OVERHEAD	-	472	472	81,905	82,377
TOTAL	\$ -	\$ 38,776	\$ 38,776	\$ 1,237,677	\$ 1,276,453

Source: Broward County Water and Wastewater Services

Table A-4.10
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
WHOLESALE REGIONAL TRANSMISSION (MASTER LIFT STATIONS)

Wholesale Regional Transmission (Master Lift Stations)	District Four		
	Operations	Maintenance	Total O & M
PERSONAL SERVICES	\$ 459,897	\$ 367,309	\$ 827,206
OPERATING MATERIAL	167,161	248,756	415,917
OTHER MATERIAL	-	-	-
UTILITIES-OTHER	114,477	-	114,477
ELECTRIC	508,126	-	508,126
TREAT/TRANS	-	-	-
PURCHASED WATER	-	-	-
RENTAL/LEASES	-	-	-
MOTOR POOL	-	50,153	50,153
CONTRACT SERVICE	14,704	272,702	287,406
OTHER	3,656	9,420	13,076
EDUCATIONAL COURSES	-	-	-
COMPUTER MAINTENANCE	9,651	-	9,651
TRAVEL	-	-	-
OTHER CHEMICALS	-	-	-
CHEMICALS CHLORINE	-	-	-
CHEMICALS LIME	-	-	-
SUBTOTAL	1,277,672	948,340	2,226,012
<u>OPERATING COST RECLASS:</u>			
ONE CALL	7,338	-	7,338
SUBTOTAL	7,338	-	7,338
<u>ALLOCATE:</u>			
SECTION ADMIN.	1,333	989	2,322
DIVISION ADMINISTRATION	90,544	67,205	157,749
SUBTOTAL DIRECT OVERHEAD	91,877	68,195	160,071
TOTAL	\$ 1,376,886	\$ 1,016,534	\$ 2,393,421

Source: Broward County Water and Wastewater Services

Table A-4.11
Water and Wastewater Services
Activity Based Costing Report For the Twelve Months Ended September 30, 2015
GENERAL & ADMINISTRATIVE

	WWS Administration		Engineering Division (WWED)	Information Technology Division (WWITD)				Business Operations Division (BOD)				Total
	Administration	Project & Community Coordinator		Infrastructure Support	Application Development	Desktop Support	SCADA	Customer Service	Grounds & Buildings	Warehouse Costs	Other Costs	
PERSONAL SERVICES	\$ 778,943	\$ -	\$ 1,763,225	\$ 967,823	\$ 812,952	\$ -	\$ -	\$ 2,226,845	\$ 217,253	\$ 289,856	\$ 802,726	\$ 7,859,624
OPERATING MATERIAL	1,977	-	207,767	10,517	-	-	-	370,648	71,819	43,433	-	706,162
OTHER MATERIAL	18,012	-	28,402	313,531	4,605	-	-	346,232	-	1,394	7,324	719,499
UTILITIES-OTHER	3,123	-	2,132	271,462	-	-	-	-	1,078	-	-	277,796
ELECTRIC	-	-	-	-	-	-	-	272	268,155	-	-	268,427
TREAT/TRANS	-	-	-	-	-	-	-	-	-	-	-	-
PURCHASED WATER	-	-	-	-	-	-	-	-	-	-	-	-
RENTAL/LEASES	198	-	3,081	-	-	-	-	19,292	-	-	-	22,571
MOTOR POOL	-	-	39,748	382	-	-	-	61,145	22,308	823	-	124,405
CONTRACT SERVICE	2,436	-	33,622	334,122	420,078	-	-	1,455,330	647,134	5,948	144,548	3,043,219
OTHER	(31,189)	-	(52,888)	325	-	-	-	57,311	15,973	13,697	662	3,893
COUNTY SERVICES	4,228,670	-	-	-	-	-	-	-	-	-	-	4,228,670
EDUCATIONAL COURSES	2,417	-	17,353	40,825	22,617	-	-	580	475	-	844	85,111
COMPUTER MAINTENANCE	-	-	-	68,974	-	-	-	-	-	-	-	68,974
PURCHASED INSURANCE	1,486,621	-	-	-	-	-	-	-	-	-	-	1,486,621
TRAVEL	759	-	3,129	-	-	-	-	301	-	-	-	4,190
OPERATING COSTS RECLASS	3,163	-	-	-	-	-	-	-	-	-	-	3,163
CHEMICALS CHLORINE	-	-	-	-	-	-	-	-	-	-	-	-
CHEMICALS LIME	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL	6,495,129	-	2,045,572	2,007,963	1,260,252	-	-	4,537,957	1,244,196	355,151	956,105	18,902,325
ALLOCATE:												
DIVISION ADMINISTRATION				430,950	270,476	-	-	243,858	66,860	19,085	51,378	1,082,606
TOTAL	6,495,129	-	2,045,572	2,438,912	1,530,728	-	-	4,781,814	1,311,055	374,236	1,007,483	19,984,931
TOTAL TO BE ALLOCATED	6,495,129	-	2,045,572	2,438,912	1,530,728	-	-	4,781,814	1,311,055	374,236	1,007,483	19,984,931
	(6,495,129)	-	(2,045,572)	(2,438,912)	(1,530,728)	-	-	(4,781,814)	(1,311,055)	(374,236)	(1,007,483)	(19,984,931)
BALANCE AFTER ALLOCATION	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Source: Broward County Water and Wastewater Services

Table A-5
Water and Wastewater Services
Disaggregation of Operating & Maintenance Expenses For The Twelve Months Ended September 30, 2015

OPERATION AND MAINTENANCE EXPENSES:	RETAIL WATER	RETAIL WASTEWATER	WHOLESALE RAW WATER	WHOLESALE TREATMENT	WHOLESALE TRANSMISSION	WWS ADMIN, WWITD & BOD	ENGINEERING	TOTAL
Personal Services	\$ 4,628,189	\$ 2,128,713	\$ 77,909	\$ 4,974,544	\$ 827,206	\$ 6,096,398	\$ 1,763,225	\$ 20,496,185
Utility Services	1,294,959	3,323,850	430,856	3,589,067	622,603	544,091	2,132	9,807,558
Material & Supplies	1,174,770	1,453,569	114,935	1,333,860	415,917	1,189,492	236,169	5,918,712
Chemicals	2,235,134	-	-	990,602	-	-	-	3,225,737
Motor Pool	267,547	316,406	-	229,412	50,153	84,657	39,748	987,923
Contractual Services	1,122,022	441,176	23,741	4,049,730	287,406	3,009,597	33,622	8,967,293
Purchased Insurance	-	-	-	-	-	1,486,621	-	1,486,621
County Administrative Service	-	-	-	-	-	4,228,670	-	4,228,670
Purchased Water	6,151,622	-	-	-	-	-	-	6,151,622
Rental & Leases	1,357	452	-	19,968	-	19,489	3,081	44,348
Travel	-	-	-	792	-	1,060	3,129	4,982
Other	391,560	16,994	225,646	214,505	13,076	59,944	(52,888)	868,837
Educational Courses	18,673	-	-	14,940	-	67,759	17,353	118,725
Computer Maintenance	-	17,669	-	4,428	9,651	68,974	-	100,723
IRR & Expensed Projects	-	-	-	-	-	-	-	-
SUBTOTAL O & M EXPENSES	17,285,832	7,698,830	873,087	15,421,850	2,226,012	16,856,752	2,045,572	62,407,935
OPERATING OVERHEAD:								
SECTION ADMINISTRATION	(13,686)	(7,895)	(1,050)	14,881	2,322	-	-	(5,428)
DIVISION ADMINISTRATION	1,224,983	545,588	61,872	1,092,890	157,749	1,082,606	-	4,165,688
ONE CALL	74,802	41,179	2,300	-	7,338	-	-	125,619
PAINT SHOP	20,766	20,283	-	7,244	-	-	-	48,292
HEAVY EQUIPMENT	136,631	70,143	2,204	31,743	-	-	-	240,721
GENERATORS	-	224,570	-	-	-	-	-	224,570
LAB	493,324	2,569	20,555	752,833	15,416	-	-	1,284,698
SUBTOTAL OPERATING O/H	1,936,820	896,437	85,881	1,899,591	182,825	1,082,606	-	6,084,161
TOTAL EXPENSES BEFORE ALLOCATION	19,222,651	8,595,267	958,968	17,321,441	2,408,837	17,939,359	2,045,572	68,492,096
ALLOCATION:								
CUSTOMER SERVICE	2,273,025	1,887,154	47,818	478,181	95,636	(4,781,814)	-	-
WWS ADMINISTRATION	6,024,764	2,693,929	300,560	5,428,887	754,978	(13,157,544)	(2,045,572)	-
SUBTOTAL ALLOCATION	8,297,788	4,581,083	348,378	5,907,068	850,614	(17,939,359)	(2,045,572)	-
TOTAL OPERATING EXPENSES	27,520,440	13,176,349	1,307,346	23,228,509	3,259,451	-	-	68,492,096
RETAIL SHARE OF REGIONAL COST	372,059	5,037,494	-	-	-	-	-	5,409,553
TOTAL COST	\$ 27,892,498	\$ 18,213,843	\$ 1,307,346	\$ 23,228,509	\$ 3,259,451	\$ -	\$ -	\$ 73,901,648

Source: Broward County Water and Wastewater Services

**Table A-7
Water and Wastewater Services
Historical and Budgeted Large Users Operating & Maintenance Rates**

Period Large User Charge in Effect	Treatment & Disposal Rate Per 1,000 Gallons	Transmission Rate Per 1,000 Gallons	Combined Rate Per 1,000 Gallons
Fiscal 2007	\$0.69	\$0.14	\$0.83
Fiscal 2008	\$0.70	\$0.14	\$0.84
Fiscal 2009	\$0.68	\$0.14	\$0.81
Fiscal 2010	\$0.80	\$0.18	\$0.97
Fiscal 2011	\$0.89	\$0.21	\$1.10
Fiscal 2012	\$0.84	\$0.19	\$1.03
Fiscal 2013	\$0.78	\$0.20	\$0.98
Fiscal 2014	\$0.75	\$0.16	\$0.91
Fiscal 2015	\$0.84	\$0.16	\$1.00
Fiscal 2016	\$0.86	\$0.15	\$1.01

Source: Broward County Water & Wastewater Services

Table A-8
Water and Wastewater Services
Water and Wastewater Fund Statement of Net Position
September 30, 2015, 2014, 2013, 2012, and 2011 (In Thousands)

	FY 2015	FY 2014	FY 2013	FY 2012	FY 2011
ASSETS					
Current Assets:					
Unrestricted Assets:					
Cash & Cash Equivalents	\$ 13,305	\$ 27,881	\$ 14,441	\$ 4,531	\$ 34,511
Investments	85,915	56,591	39,703	32,234	7,335
Receivable (Net)	18,235	14,873	13,460	12,867	12,765
Due from Other Government	18	-	-	-	-
Inventory	8,694	8,511	8,070	7,557	7,121
Prepaid Items	1,337	1,568	2,051	1,391	703
Total Current Unrestricted Assets	127,504	109,424	77,725	58,580	62,435
Restricted Assets:					
Current Restricted Assets	40,717	45,757	39,144	39,280	28,484
Total Current Assets	168,221	155,181	116,869	97,860	90,919
Noncurrent Assets:					
Noncurrent Restricted Assets	42,952	81,043	122,932	148,407	35,549
Deferred Bond Issuance Costs	-	-	-	-	2,466
Capital Assets:					
Utility Plant in Service (1)	1,143,447	1,124,870	1,102,690	1,035,917	-
Land	4,936	4,936	4,904	4,904	4,901
Buildings (1)	-	-	-	-	209,769
Equipment (1)	28,688	27,270	26,710	24,509	761,713
Construction in Progress	101,079	63,231	40,268	70,212	108,117
Total Capital Assets	1,278,150	1,220,307	1,174,572	1,135,542	1,084,500
Less Accumulated Depreciation	(520,093)	(485,842)	(452,215)	(418,484)	(388,541)
Total Capital Assets, Net	758,057	734,465	722,357	717,058	695,959
Total Noncurrent Assets	801,009	815,508	845,289	865,465	733,974
Total Assets	\$ 969,230	\$ 970,689	\$ 962,158	\$ 963,325	\$ 824,893
DEFERRED OUTFLOWS OF RESOURCES	\$ 31,639	\$ 13,445	\$ 13,311	\$ 14,798	\$ -
LIABILITIES					
Current Liabilities:					
Payable From Unrestricted Assets:					
Accounts Payable and Accrued Liabilities	\$ 6,827	\$ 3,547	\$ 3,216	\$ 4,485	\$ 9,453
Due to Other County Funds	-	-	-	-	21,355
Due to Other Governments	4,032	3,091	3,258	2,425	2,177
Compensated Absences	1,744	1,759	1,763	1,781	1,796
Total Current Liabilities Payable from Unrestricted Assets	12,603	8,397	8,237	8,691	34,781
Payable From Restricted Assets					
Accounts Payable and Accrued Liabilities	9,442	11,257	5,013	8,436	12
Accrued Interest Payable	8,352	11,897	12,068	11,914	9,984
Revenue Bonds Payable	13,875	13,705	13,360	10,440	10,110
Customer Deposits	9,048	8,898	8,703	8,490	8,378
Total Current Liabilities Payable from Restricted Assets	40,717	45,757	39,144	39,280	28,484
Total Current Liabilities	53,320	54,154	47,381	47,971	63,265
Noncurrent Liabilities:					
Revenue Bonds Payable, Net of Discount & Premiums	539,373	535,928	551,826	567,379	402,623
Compensated Absences	1,815	1,865	1,822	2,220	2,487
Other Post Employment Benefits	762	690	617	538	470
Net Pension Liabilities	14,067	9,798	-	-	-
Total Noncurrent Liabilities	556,017	548,281	554,265	570,137	405,580
Total Liabilities	\$ 609,337	\$ 602,435	\$ 601,646	\$ 618,108	\$ 468,845
DEFERRED INFLOWS OF RESOURCES	\$ 1,988	\$ 5,898	\$ -	\$ -	\$ -
NET POSITION					
Net Investment in Capital Assets	\$ 270,706	\$ 271,569	\$ 287,484	\$ 259,115	\$ 276,709
Restricted For:					
Debt Service Reserve	13,875	13,705	13,360	47,939	40,110
Renewal, Replacement and Improvement	6,200	6,130	5,930	5,830	5,600
Unrestricted	98,763	84,397	67,049	47,131	33,629
Total Net Position	\$ 389,544	\$ 375,801	\$ 373,823	\$ 360,015	\$ 356,048

Notes:

(1) Reclassified certain capital assets to Utility Plant in Service category in Fiscal Years 2013 and 2012.

Source: Broward County Water and Wastewater Services

Table A - 9
Water and Wastewater Services
Water & Wastewater Fund Statement of Revenue, Expense, and Changes in Net Position
September 30, 2015, 2014, 2013, 2012, and 2011 (In Thousands)

	FY 2015	FY 2014	FY 2013	FY 2012	FY 2011
Operating Revenue:					
Retail Services:					
Water	\$ 46,947	\$ 44,508	\$ 43,114	\$ 45,642	\$ 44,294
Wastewater	38,999	35,740	34,485	33,476	32,664
Septic Charges	2,743	2,232	1,977	1,545	1,519
Other Services	7,473	6,932	6,807	4,070	4,094
	96,162	89,412	86,383	84,733	82,571
Wholesale Services:					
Water	849	945	876	701	820
Wastewater	34,417	32,413	32,957	31,228	30,660
Total Operating Revenue	131,428	122,770	120,216	116,662	114,051
Operating Expenses:					
Personal Services	24,405	23,081	23,208	23,108	24,664
Utilities Services	15,712	14,927	15,338	15,400	14,273
Chemicals	3,225	3,281	3,086	2,784	2,803
County Services	4,052	3,339	3,236	3,334	3,390
Material and Supplies	5,628	4,923	5,635	4,432	5,656
Motor Pool	1,322	1,245	1,449	1,520	1,387
Contractual Services	10,294	8,423	8,203	8,420	6,196
Other	2,247	2,583	3,220	5,075	5,574
Total Operating Expense Before Depreciation	66,885	61,802	63,375	64,073	63,943
Operating Income Before Depreciation	64,543	60,968	56,841	52,589	50,108
Depreciation Expense	34,962	34,730	33,947	31,039	30,975
Operating Income	29,581	26,238	22,894	21,550	19,133
Non-Operating Revenue (Expense):					
Grants	18	11	20	-	-
Interest Income	351	394	353	793	1,570
Interest Expense, Net of Capitalized Interest	(16,385)	(16,964)	(17,235)	(18,557)	(17,608)
Other Income	469	941	1,938	1,053	853
Bond Issuance Costs	(1,506)	-	-	(2,306)	-
Discontinued Project Costs	(1,344)	(499)	(179)	-	-
Other Expense	(36)	(32)	(24)	(11)	(295)
Gain/(Loss) on Disposal of Assets	71	25	4	22	25
Total Non-Operating (Expense)	(18,362)	(16,124)	(15,123)	(19,006)	(15,455)
Income before Capital Contributions and Transfers	11,219	10,114	7,771	2,544	3,678
Capital Contributions	8,046	6,600	6,037	4,768	3,936
Transfer Out	(5,522)	-	-	-	-
Change in Net Position	13,743	16,714	13,808	7,312	7,614
Total Net Position - Beginning, as Restated (1)	375,801	359,087	360,015	352,703	348,434
Total Net Position - Ending	\$ 389,544	\$ 375,801	\$ 373,823	\$ 360,015	\$ 356,048

Notes:

(1) The October 1, 2013 beginning balance in the table above was restated due to the implementation of GASB Statement No. 68, Accounting and Financial Reporting for Pensions - an amendment of GASB Statement No. 27 and GASB Statement No. 71, Pension Transition for Contributions Made Subsequent to the Measurement Date - an amendment of GASB Statement No. 68.

The October 1, 2012 beginning balance in the table above was restated due to the implementation of GASB Statement No. 65, Items Previously Reported as Assets and Liabilities.

Source: Broward County Water and Wastewater Services

Table A-10
Water and Wastewater Services
Water & Wastewater Fund Statement of Cash Flows
September 30, 2015, 2014, 2013, 2012, and 2011 (In Thousands)

	FY 2015	FY 2014	FY 2013	FY 2012	FY 2011
Cash Flows From Operating Activities:					
Cash Received from Customers	\$ 128,787	\$ 121,370	\$ 120,655	\$ 117,325	\$ 116,498
Cash Payments to Suppliers for Goods and Services	(43,305)	(38,988)	(42,004)	(41,486)	(38,846)
Cash Payments to Employees for Services	(24,838)	(23,439)	(23,503)	(23,410)	(24,888)
Other Cash Received (Paid)	469	941	980	1,053	853
Net Cash Provided by Operating Activities	61,113	59,884	56,128	53,482	53,617
Cash Flows From Noncapital Financing Activities:					
Transfers Out	(5,522)	-	-	-	-
Cash from Noncapital Grants	-	11	20	-	-
Net Cash Provided by Noncapital Financing Activities	(5,522)	11	20	-	-
Cash Flows From Capital and Related Financing Activities					
Proceeds from Revenue Bonds	653	-	-	157,651	-
Payment of Refunded Bond Escrow Agent	(748)	-	-	-	-
Payment of Bond Issuance Costs	(546)	-	-	(110)	-
Acquisition and Construction of Capital Assets	(48,355)	(33,708)	(35,632)	(43,827)	(64,245)
Proceeds from Internal Loan	-	-	-	3,513	21,355
Payments on Internal Loan	-	-	-	(24,869)	-
Interest Paid on Internal Loan	-	-	-	(175)	-
Proceeds from Sale of Capital Assets	71	69	12	22	25
Capital Recovery Fees	3,120	4,093	3,680	636	662
Capital Surcharges Contributed from Other Governments	1,743	1,662	1,633	1,709	1,721
Principal Paid on Revenue Bonds	(13,705)	(13,360)	(10,440)	(10,110)	(9,706)
Interest Paid on Revenue Bonds	(26,892)	(23,965)	(23,982)	(19,724)	(17,457)
Other Costs Paid	(36)	(43)	(18)	(11)	(295)
Net Cash Used For Capital and Related Financing Activities	(84,695)	(65,252)	(64,747)	64,705	(67,940)
Cash Flows From Investing Activities:					
Purchase of Investment Securities	(235,835)	(166,287)	(130,683)	(70,241)	(102,646)
Proceeds from Sale and Maturities of Investment Securities	232,437	150,090	123,945	49,500	87,341
Interest on Investments	721	409	367	793	1,569
Net Cash (Used For) Provided by Investing Activities	(2,677)	(15,788)	(6,371)	(19,948)	(13,736)
Net Increase (Decrease) In Cash & Cash Equivalents	(31,781)	(21,145)	(14,970)	98,239	(28,059)
Cash & Cash Equivalents, Beginning of Year	113,532	134,677	149,647	51,408	82,624
Cash & Cash Equivalents, End of Year	\$ 81,751	\$ 113,532	\$ 134,677	\$ 149,647	\$ 54,565
Cash and Cash Equivalents - Unrestricted Assets	\$ 13,305	\$ 27,881	\$ 14,441	\$ 4,531	\$ 41,846
Cash and Cash Equivalents - Restricted Assets	68,446	85,651	120,236	145,116	12,719
Total Cash & Cash Equivalents	\$ 81,751	\$ 113,532	\$ 134,677	\$ 149,647	\$ 54,565
Reconciliation Of Operating Income To Net Cash Provided By Operating Activities:					
Operating Income	\$ 29,581	\$ 26,238	\$ 22,894	\$ 21,550	\$ 19,133
Depreciation	34,962	34,730	33,947	31,039	30,975
Miscellaneous Non-Operating Income (Expense)	469	941	1,030	1,053	853
Decrease (Increase) in Assets and Deferred Outflows of Resources:					
Accounts Receivable	(3,732)	(1,428)	(607)	304	2,014
Inventory	(183)	(441)	(513)	(436)	121
Prepaid Items	(223)	197	131	(687)	560
Deferred Outflows on Pensions	(873)	(1,312)	-	-	-
Increase (Decrease) in Liabilities and Deferred Inflows of Resources:					
Accounts Payable	(419)	(23)	(1,455)	601	(247)
Accrued Liabilities	74	191	(8)	(87)	27
Due to Other Governments	941	(167)	833	248	228
Customer Deposits	150	195	213	111	205
Compensated Absences	(65)	39	(416)	(282)	(376)
Other Post Employment Benefits	72	73	79	68	124
Net Pension Liability	4,269	(5,247)	-	-	-
Deferred Inflows on Pensions	(3,910)	5,898	-	-	-
Total Adjustments	31,532	33,646	33,234	31,932	34,484
Net Cash Provided by Operating Activities	\$ 61,113	\$ 59,884	\$ 56,128	\$ 53,482	\$ 53,617

Source: Broward County Water and Wastewater Services

**Table A-11
Water and Wastewater Services
Water and Wastewater Retail Statistics (1,000's gallons)
As of September 30, 2015**

Water	Produced	Purchased	Billed	System Uses & Losses
District 1	2,738,993	46,000	2,515,305	269,688
District 2	4,587,531	0	2,389,124	-
District 2 - Resale	0	0	1,789,374	409,033
District 3A	0	1,145,984	970,253	175,731
District 3BC	0	1,101,034	1,074,830	26,204
Total	7,326,524	2,293,018	8,738,885	880,657

Wastewater	Billed *	Wastewater Transmission to Plant
District 1	2,330,439	2,509,103
District 2	2,061,934	2,329,977
District 3A	656,921	672,325
District 3BC	322,948	338,239
Total	5,372,243	5,849,644

* Based upon water billed to wastewater customers. Residential billing capped at 15,000 gallons.

Source: Broward County Water and Wastewater Services

Table A-12			
Water and Wastewater Services			
WWS Capital Improvement Program Budget History and Projections			
FY	Capital Budget	Debt Financed	Cash Financed
2005	88,852,571	22,792,255	40,999,372
2006	76,378,590	34,207,745	24,427,103
2007	78,678,510	38,775,056	13,951,976
2008	84,191,260	34,080,229	14,277,285
2009	70,447,060	34,136,740	9,585,084
2010	39,665,540	44,291,612	12,341,221
2011	81,438,970	51,020,406	11,397,849
2012	34,695,650	28,718,290	18,825,564
2013	85,366,450	26,486,078	3,291,213
2014	74,726,900	31,501,547	2,718,458
2015	142,412,090	29,226,894	19,108,000
2016	87,336,180	30,000,000	24,715,000
2017	121,751,250	30,000,000	26,295,000
2018	75,204,190	30,000,000	30,898,000
2019	123,374,300	30,000,000	34,767,000
2020	20,826,000	17,000,000	18,039,000

Source: Broward County Water and Wastewater Services

Table A-13			
Water and Wastewater Services			
Historical Capital Recovery Fees Collected			
Fiscal Year Ended 9/30	Water	Wastewater	Total
2006	1,088,629	1,288,714	2,377,343
2007	2,825,876	1,068,021	3,893,897
2008	914,606	942,749	1,857,355
2009	-220,999	-83,229	-304,228
2010	75,862	198,779	274,641
2011	287,404	374,258	661,661
2012	35,454	600,408	635,862
2013	2,014,861	1,665,189	3,680,050
2014	1,838,187	2,255,302	4,093,489
2015	1,498,657	1,621,728	3,120,385

Source: Broward County Water and Wastewater Services

Table A-14					
Water and Wastewater Services					
History of Large User Wastewater Rates					
Fiscal Year Ended 9/30	O&M (Per 1,000 gallons)		Debt Service (Per MGD)		IR&R Surcharge
	Treatment	Transmission	Treatment	Transmission	
2016	0.861	0.151	15,922.79	5,302.12	5.0%
2015	0.839	0.162	16,155.30	5,475.88	5.0%
2014	0.747	0.158	16,153.27	5,476.00	5.0%
2013	0.780	0.195	16,165.78	5,439.64	5.0%
2012	0.839	0.186	12,562.44	5,155.32	5.0%
2011	0.886	0.211	12,849.17	5,278.69	5.0%
2010	0.795	0.179	14,251.52	6,139.48	5.0%
2009	0.676	0.136	11,253.00	3,840.90	5.0%
2008	0.687	0.139	10,096.74	3,641.36	5.0%
2007	0.689	0.136	10,119.20	3,641.27	2.5%

Source: Broward County Water and Wastewater Services