



**TOWN OF DAVIE**  
**PLANNING & ZONING DIVISION**  
6591 ORANGE DRIVE • DAVIE, FLORIDA 33314-3399  
Phone: 954.797.1103 • Fax: 954.797.1204 • www.davie-fl.gov

**MEMORANDUM**

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TO: Planning and Zoning Board

FROM: David Quigley, Planning & Zoning Manager (954-797-1075) 

DATE: January 6, 2015

SUBJECT: Water Supply Facilities Work Plan Update

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**BACKGROUND**

The proposed ordinance is necessary to update the Town's Water Supply Facilities Work Plan and related Comprehensive Plan Elements (see details in attached memorandum from the Town's consultant, Calvin, Giordano and Associates, Inc.).

**RECOMMENDATION**

Staff recommends that the Planning and Zoning Board find that the proposed ordinance is consistent with and furthers the Town's Comprehensive Plan.



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Date: December 17, 2014

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To: Don Bayler - Town of Davie Utilities Director

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From: Nakeischea Smith, AICP – Senior Planner CGA

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Subject: Water Supply Facilities Work Plan Update

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Project: 96-1630.91

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CC: David Quigley, AICP – Town of Davie Planning and Zoning Manager

Calvin, Giordano & Associates has completed its review and initial update to the 2009 Town of Davie Water Supply Facilities Work Plan.

This update is required by Florida Statute as a result of significant changes enacted in 2005 by the Florida Legislature to address the State's water supply needs. These changes required a stronger link between regional water supply plans prepared by water management districts and comprehensive plans prepared by local governments. In addition, improved coordination between local land use planning and local water supply planning was mandated.

Chapter 163 F.S. and Chapter 373 F.S. requires that the Town of Davie identify how future water supply needs will be met through the preparation of a Water Supply Facilities Work Plan (Work Plan). The Work Plan must have a minimum planning horizon of 10 years and must be incorporated into the Town of Davie Comprehensive Plan. The Work Plan must be completed within 18 months of the South Florida Water Management District (SFWMD) adopting or updating its own Lower East Coast (LEC) regional water supply plan.

The most recent update to the SFWMD regional LEC water supply plan was prepared in September 2013. As such, the Town of Davie must update its Work Plan and any other corresponding chapters within its Comprehensive Plan by March 2015. The updates which are currently proposed will serve to meet the requirements of the Florida Statutes. Only the sections of each element of the Comprehensive Plan related to water supply have been amended.

CGA recommends review and adoption of the 2015 update to the Town of Davie Water Supply Facility Work Plan by both the Local Planning Agency and the Town Council as required by Chapter 163 and Chapter 373 of Florida Statutes, in addition to adoption of any corresponding amendments to the Town of Davie Comprehensive Plan as it relates to potable water supply. It is required that the proposed Work Plan also be forward to State and County regulatory agencies prior to final adoption by the Town Council.

**Exhibits:**

1. Exhibit A - Revised Town of Davie Water Supply Facilities Work Plan
2. Exhibit B - Revised Comprehensive Plan Chapters

ORDINANCE NO. \_\_\_\_\_

AN ORDINANCE OF THE TOWN OF DAVIE, FLORIDA, AMENDING THE TOWN'S WATER SUPPLY FACILITIES WORK PLAN AND APPLICABLE ELEMENTS WITHIN THE TOWN'S COMPREHENSIVE PLAN RELATING TO WATER SUPPLY PLANNING; PROVIDING FOR CONFLICT, PROVIDING FOR SEVERABILITY, AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Section 163.3167, Florida Statutes, requires each local government to address in its Comprehensive Plan, the water supply sources necessary to meet and achieve the existing and projected water use demand for an established planning period; and

WHEREAS, the Town recognizes the need for integration between land use planning and water supply planning; and

WHEREAS, Section 163.3177, Florida Statutes, requires that local governments prepare and adopt at least a 10-Year Water Supply Facilities Work Plan; and

WHEREAS, in order to reflect recent updates to state and regional Water Supply Facilities Work Plans, the Town desires to amend its Water Supply Facilities Work Plan and related elements within the City's Comprehensive Plan; and

WHEREAS, the Planning and Zoning Board of the Town of Davie reviewed the proposed ordinance at a public hearing on January 14, 2015; and

WHEREAS, the Town Council finds that the proposed amendments are consistent with state law and the Town's Comprehensive Plan; and

WHEREAS, the Town Council finds that this Ordinance is in the best interest and welfare of the residents of the Town of Davie.

NOW, THEREFORE, BE IT ORDAINED BY THE TOWN COUNCIL OF THE TOWN OF DAVIE, FLORIDA.

SECTION 1. The foregoing "WHEREAS" clauses are hereby ratified and confirmed as being true and correct and are hereby made a part of this Ordinance.

SECTION 2. The Town Council hereby adopts an amendment to its Water Supply Facilities Work Plan and also incorporates by reference its Water Supply Facilities Work Plan into its Comprehensive Plan as supporting data and analysis for the amendments adopted in this Ordinance. A copy of the Water Supply Facilities Work Plan is provided in Exhibit "A."

SECTION 3. The Town's Comprehensive Plan is hereby amended as provided in Exhibit "B," which is attached hereto and made part of this Ordinance.

SECTION 4. All ordinances or parts of ordinances in conflict herewith are to the extent of such conflict hereby repealed.

SECTION 6. If any section, subsection, sentence, clause, phrase, or portion of this ordinance is, for any reason, held invalid or unconstitutional by any court of competent jurisdiction, such portion shall

be deemed a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portion of this ordinance.

SECTION 7. This ordinance shall take effect immediately upon its passage and adoption.

PASSED ON FIRST READING THIS \_\_\_\_ DAY OF \_\_\_\_\_, 2015

PASSED ON SECOND READING THIS \_\_\_\_ DAY OF \_\_\_\_\_, 2015

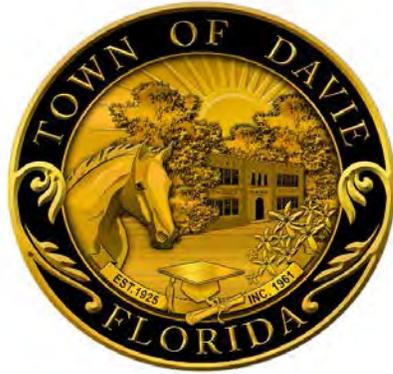
\_\_\_\_\_  
MAYOR/COUNCILMEMBER

ATTEST:

\_\_\_\_\_  
TOWN CLERK

APPROVED THIS \_\_\_\_ DAY OF \_\_\_\_\_, 2015

EXHIBIT "A"



**TOWN OF DAVIE**  
**Broward County, FLORIDA**

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**2010 YEAR WATER SUPPLY**

**FACILITIES WORK PLAN**

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Prepared by:



**Calvin, Giordano & Associates, Inc.**  
EXCEPTIONAL SOLUTIONS

1800 Eller Drive, Suite 600, Fort Lauderdale, Florida 33316  
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Certificate of Authorization #514

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March 2015~~July 2009~~

CGA Project No. 96-1630.9196-1630

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~~City of Fort Lauderdale~~

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~~Broward County~~

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## SECTION 1 - INTRODUCTION

The State of Florida ~~has adopted revised~~ legislation ~~to~~has strengthened the linkage between growth and water availability based on demands illustrated in the water supply planning process. This ~~24~~0-Year Water Supply Facilities Work Plan (WSFWP) has been prepared by the Town of Davie, located within Broward County. The Plan meets the requirements for local governments and shall be incorporated into the Comprehensive Plan. In addition to updating the WSFWP, the Town is Local Governments are required to revise relevant sections of the Infrastructure Element of their Comprehensive Plan after their Regional Water Supply Plan is adopted along with a submittal for Comprehensive Plan Amendments for review by the Florida Department of Economic Opportunity Community Affairs (DEOCA) and other State regulatory agencies.

### 1.1 BACKGROUND

Beginning in 2002, the State of Florida Legislature ~~has required~~ improved ~~the~~ coordination between the Regional Water Supply Needs and Sources Plan developed by the South Florida Water Management District (SFWMD) and local government land use planning activities. The new legislation eoordination started requiring required local governments located ~~within~~ an area ~~with that had~~ a Regional Water Supply Needs and Sources Plan, to prepare a ~~10-Year~~ Water Supply Facilities Work Plan (WSFWP) with a minimum planning horizon of ten years. In order to that ensured a linkage between the Regional Water Supply Plan and their individual comprehensive plans. E each local government WSFWP Work Plan must is required to address infrastructure, conservation, capital improvements, and intergovernmental coordination as it relates to in addition to water supplies eoordination.

The Regional Water Supply Needs and Sources Plan relevant to the Town of Davie is the Lower East Coast Regional Water Supply Plan (LEC Plan), which was adopted in September of 2013. Growth Management Statute and Rule Requirements Related to Water Supply Planning, includes a summary of regulatory requirements that influence local governments and their water supply. The LEC Plan was prepared by the South Florida Water Management District (SFWMD). In compiling the LEC Plan the For the required regional water supply planning efforts, SFWMD evaluated the adequacy of existing water supplies to meet existing and future water demands. Through its evaluation, the SFWMD and determined that traditional water supply resources from the Biscayne Aquifer will not be adequate to meet future demands. The Lower East Coast Regional Water Supply Plan (LEC) adopted, February 15, 2007, indicates As such, future water supply needs will need to be met by implementation of alternative water supply sources. The Town of Davie, along with other All local governments within the LEC regional planning area, iswere required to update its WSFWP develop by March 2015 in accordance with Florida State Statutes. The update must demonstrate how current and future water supply needs will be met at the local level. In addition, water supply issues identified within the LEC Plan such as the need to implement alternative water supply sources must be addressed. a Work Plan to strengthen the linkage between the regional water supply plan and their individual comprehensive plans by August 15, 2008. This date has been extended.

## 1.2 PURPOSE

The WSFWP will assess the Town's current water sources and the associated facilities and evaluate their adequacy to meet the projected raw and treated water demands. This WSFWP will also present data from the other suppliers which provide potable water service to the Town outside the Town's water service area and show the showing that they have planned and funded Alternative Water Supply (AWS) infrastructure improvements to be implemented within the planning period. ~~continue to service these Town of Davie customers. The WSFWP will outline alternative water supply sources required to meet projected shortfalls and will present and implementation plan that will allow the Town's efforts to develop and maintain sustainable water sources for its overall service area. The Town last prepared a rate study during the last quarter of 2007 and implemented new revised its rates, charges and other connection type of fees to fund future alternative water supply infrastructure improvements AWS improvements on December 17, 2007, (see Appendix A – ORDINANCE NO. 2007-38), which changed these rates, fees and charges on 12/17/07).~~

The WSFWP will facilitate the required coordination efforts for water supply needs and will be incorporated in the Town's five year Capital Improvement Plan (CIP). The WSFWP development will facilitate the required coordination efforts for water supply and land use planning between the Town's Planning and Zoning Division ~~Development Department~~ and Utility Department, the SFWMD, and each of the water providing local utilities (City of Fort Lauderdale, City of Sunrise, Broward County, City of Hollywood, ~~Fernest Tyndall and Tyndall Hammock~~ Utilities). As required, the WSFWP must be updated ~~every five years or~~ within 18 months of a revision to the LEC Plan.

## SECTION 2 – WATER SERVICE AREA

The Town of Davie owns and operates ~~two its own~~ Water Treatment Plants (WTP) and distribution systems. However, the plants ~~are~~ not of sufficient size to provide potable water to all residents within the Town's boundaries illustrated in **Figure 2-1 Land Use Map**. Therefore, portions of the Town are supplied by other utility providers (City of Hollywood, Broward County, City of Fort Lauderdale, ~~Fernerest~~Tyndall Hammock Utilities and City of Sunrise). ~~Fernerest~~Tyndall Hammock Utilities has its own water treatment facility however the plant is not of sufficient size to provide potable water to all residents within the ~~Fernerest~~Tyndall Hammock service area. The Town of Davie therefore provides some water to ~~Fernerest~~Tyndall Hammock Utilities through ongoing agreements. The existing Utility service area boundaries are illustrated in **Figure 2-2**.

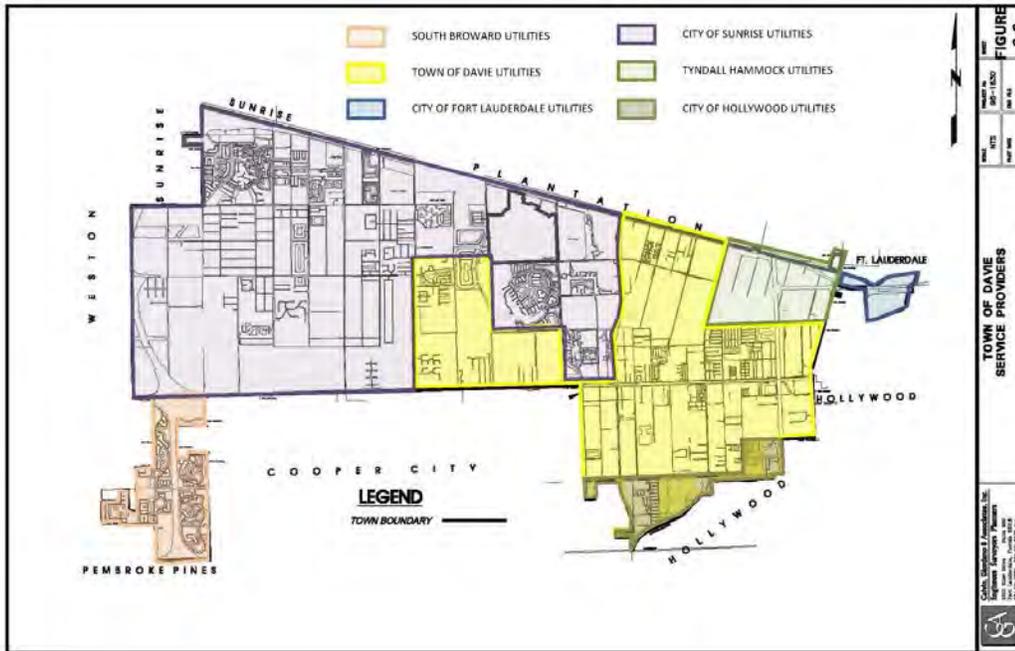
### 2.1 WATER SERVICE AREA

The Town of Davie is located in Broward County; the Town's utility provides water service to approximately 30,174 people. The Town's Utility service area is bounded by Pembroke Pines, Fort Lauderdale, City of Sunrise, City of Weston, City of Hollywood, Southwest Ranches, Cooper City, Dania Beach, City of Plantation, unincorporated Broward County and the Seminole Tribe of Florida Reservation. Potable water is provided to Town residents by different utility providers: Town of Davie, Tyndall Hammock Utilities, City of Sunrise, Broward County, City of Hollywood, and City of Fort Lauderdale. The Town of Davie Utility's service area includes the majority of eastern Davie and the Hard Rock Hotel complex on the Seminole Tribe of Florida Reservation. Tyndall Hammock Utilities provides potable water to a portion South of I-595 generally east of Davie Rd. west of SR7 and purchases some of its water from the Town of Davie. Fort Lauderdale provides water along SR 84 in the area previously known as Hacienda Village east of SR7. Hollywood provides water to an area north of Sterling Road west of Florida's Turnpike and a small area south of Stirling Road and north of Davie Road extension. Broward County provides water to a small portion on the eastern edge of the Town at Griffin Road and Orange Drive. Potable water is provided to the remainder of the Town (predominantly the western portions of the Town) by the City of Sunrise Utilities. **Figure 2-2** illustrates the areas serviced by other utilities within the Town's boundaries.



**Figure 2-2**

**Town of Davie Utility Service Provides Area Boundaries**



Source: Calvin Giordano & Associates, INC. 2008 — (Please see enlarged map at end of report)

Notes:

1. The South Broward Utilities Area shown in **Figure 2-2** has been purchased by the City of Sunrise and is currently interconnected with the City of Sunrise utility system and is now considered a contiguous part of the Sunrise service area. The Sunrise WSFWP has included this area in its calculations.
2. The Broward County service area known as Pine Island Ridge in the northern portion of the Town bordering SR 84/I-595 has been annexed into the Town of Davie. This area is supplied water by the City of Sunrise via an agreement with Broward County and the Sunrise WSFWP has included this area in its calculations.

## **2.1 WATER SERVICE AREA**

The Town of Davie is located in Broward County; the Town's utility provides water service to approximately 31,364 people. The Town's Utility service area is bounded by Pembroke Pines, Fort Lauderdale, City of Sunrise, City of Weston, City of Hollywood, Southwest Ranches, Cooper City, Dania Beach and City of Plantation. Potable water is provided to Town residents by different utility providers: Town of Davie, Fernerest Utilities, City of Sunrise, Broward County, City of Hollywood, and City of Fort Lauderdale. The Town of Davie Utility's service area

includes the majority of eastern Davie and the Hard Rock Hotel complex on the Seminole Tribe of Florida Reservation. Fernerest Utilities provides potable water to a portion South of I-595 generally east of Davie Rd. west of SR7 and purchases some of its water from the Town of Davie. Fort Lauderdale provides water along SR 84 in the area previously known as Hacienda Village east of SR7. Hollywood provides water to an area north of Sterling Road west of Florida's Turnpike and a small area south of Sterling Road and north of Davie Road extension. Broward County provides water to a small portion on the eastern edge of the Town at Griffin Road and Orange Drive. Potable water is provided to the remainder of the Town (predominantly the western portions of the Town) by the City of Sunrise Utilities. **Figure 2-2** illustrates the existing service areas service by other utilities within the Town's boundaries.

## 2.2 SERVICE WITHIN OTHER LOCAL GOVERNMENT JURISDICTIONS

The Town of Davie regional utility currently supplies potable water for several areas within the Town's Boundaries. The remaining areas are serviced by other utilities according to existing agreements. ~~The Town of Davie is responsible for planning, financing, constructing, operating and maintaining the utilities and public water supply systems that serve the areas shown within its service area shown in **Figure 2-2** and will continue to have total responsibility over the withdrawal, treatment and distribution of potable water within this area.~~ The Town's serves two large users, the Seminole Tribe of Florida and ~~Fernerest~~Tyndall Hammock Utilities. ~~Fernerest~~Tyndall Hammock Utilities is located within the Town's boundaries and is included in this water supply plan. ~~Fernerest~~Tyndall Hammock Utilities has their own water treatment facility and recently received a 20 year water use permit for continued operation. ~~Fernerest~~Tyndall Hammock Utilities, however, does not have the capability to serve all of the customers located within its service area and purchases water from the Town to make up the difference. The Town also provides water to the South Florida Education Facility through master meters for Broward Community College, Florida Atlantic University, McFatter Technical Center, Nova Southeastern University, and the University of Florida.

### **Fernerest Tyndall Hammock Water Agreement**

Tyndall Hammock Utilities is located within the Town's boundaries and is included in this water supply plan. Tyndall Hammock Utilities has their own water treatment facility and recently received a 20 year water use permit for continued operation. Tyndall Hammock Utilities, however, does not have the capability to serve all of the customers located within its service area and purchases water from the Town to make up the difference. The Town currently supplies Fernerest with water. Periodically the Town reviews the potential to acquire the utility but it is

~~not a pressing issue since water service is provided. This was noted by the SFWMD in its review of the water use permit application.~~

### **Seminole Tribe of Florida Water Agreement**

The agreement between the Town of Davie (Town) and the Seminole Tribe of Florida (Tribe) was executed on November 20, 2001. The concept in the agreement was that the Town would provide bulk water service to the Tribe for their hotel/entertainment complex. The following are the important provisions:

- Specifies the location of the master meter and that the Tribe is responsible for operating and maintaining the meter.
- Denotes periodic testing of the meter and retroactive corrections if the meter is not found to be accurate.
- Meter is read monthly.
- Fire protection is not provided as the Tribe has its own surface water source for providing fire protection.
- Specifies that the Tribe is responsible for the construction and maintenance of all water service lines.
- The Town must deliver the water at minimum pressures of 44 psi.
- The rate per thousand gallons is \$1.37 with a maximum draw of 300,000 gallons per day when required.
- Specifies that the agreement may only be terminated if either the Town or the Tribe gives the other party ~~hereto~~ twelve (12) months' notice of its intention. ~~At the expiration of the 12-month notice period the agreement shall be deemed terminated.~~

### **2.3 PRIVATE SUPPLIERS**

Non-municipal water service providers require Water Use Irrigation Permits, Major General Water Use Irrigation Permits, Individual permits, or Major Water Use permits granted by SFWMD. Permits are issued to allow users to withdraw a specified amount of water, either from the ground, canals, lakes or rivers. This water is typically used to irrigate recreational, agricultural, residential, and industrial areas. There are individual users withdrawing from the Biscayne Aquifer within the Town.

## **SECTION 3- EXISTING WATER SUPPLY, TREATMENT, STORAGE AND TRANSMISSION, AND DISTRIBUTION FACILITIES**

The Town of Davie currently has ~~eight~~<sup>four</sup> wells located on the property of the ~~System III~~<sup>two</sup> Water Treatment Plants and four wells located on the property of the System I Water Treatment Plant with surficial water from the Biscayne Aquifer. ~~The System V WTP facility is a reverse osmosis facility using water from 5 Floridan wells. The potable water system includes two water treatment facilities, the north water treatment plant (System I) and the south water treatment plant (System III).~~ The Town of Davie currently has emergency interconnections with the Sunrise, Fort Lauderdale, Hollywood, Broward County, Cooper City and ~~Fernest~~<sup>Fernest</sup> Tyndall Hammock Utilities systems which are used in emergency situations. This section will provide an overview of the Town's water supply system, water treatment facilities, and transmission and distribution system.

### **3.1 WATER SUPPLY FACILITIES**

The Town's ~~Utility~~<sup>System III</sup> plant withdraws raw water from the Biscayne Aquifer and has a total permitted withdrawal of ~~2,020~~<sup>1,830.8</sup> MG per year. ~~The Town's System V Plant withdraws raw water from the Floridan aquifer and has a total permitted withdrawal of 5,413.3 MG per year.~~ The two treatment facilities account for a total of 89 active wells found within the plant's facilities. The Town's and other's Biscayne well fields are shown in **Figure 3-1** and the Floridan well fields are shown in **Figure 3-2**.

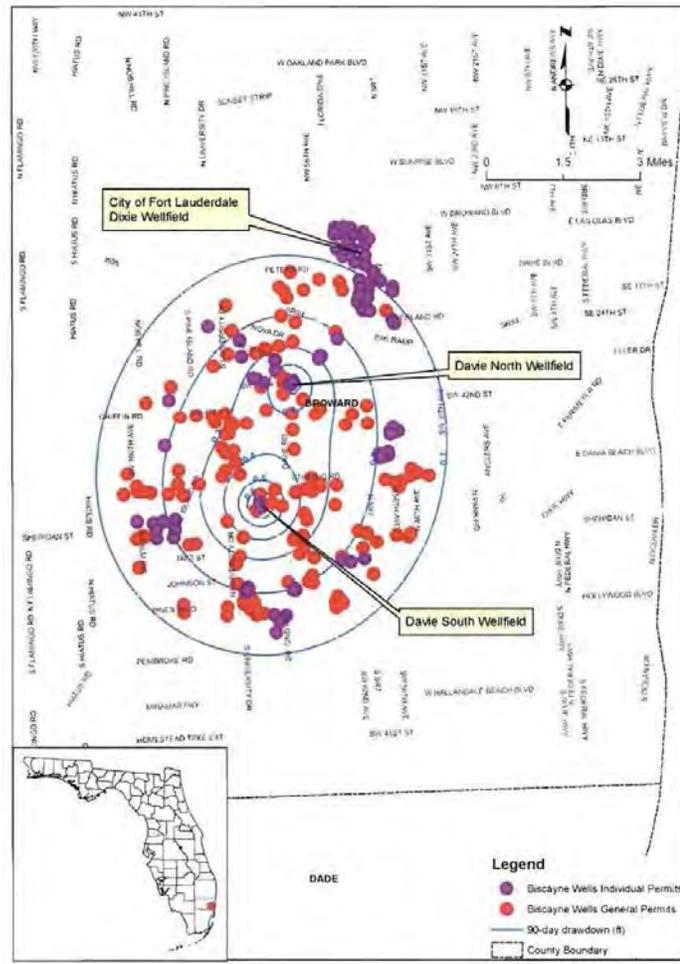
#### **3.1.1. Consumptive Use Permit Conditions**

The SFWMD regulates the volume of water that can be withdrawn from groundwater through the use of a Consumptive Use Permit (CUP) according to Part II of Chapter 373 of the Florida Statutes. On October 18, 2010 the last CUP was issued to the Town by SFWMD and expires October 24, 2030. The permitted withdrawal amounts are as follows 7,244 MG per year (average 19.847 mgd) and 652 MG maximum month (average 21.436 mgd). The Town of Davie shall coordinate with the SFWMD on alternative water supply projects in conjunction with the renewal of the permit. The Town selected a Design/Build team who recently completed the design and construction of the necessary AWS facilities to meet the future needs of the residents in the Town's utility service area. The Town of Davie is currently withdrawing an approximate average of 3.033 mgd from its wells. The Town of Davie's well information is summarized in **Table 3.1**.

Figure 3-1

**Biscayne Well Field Locations**



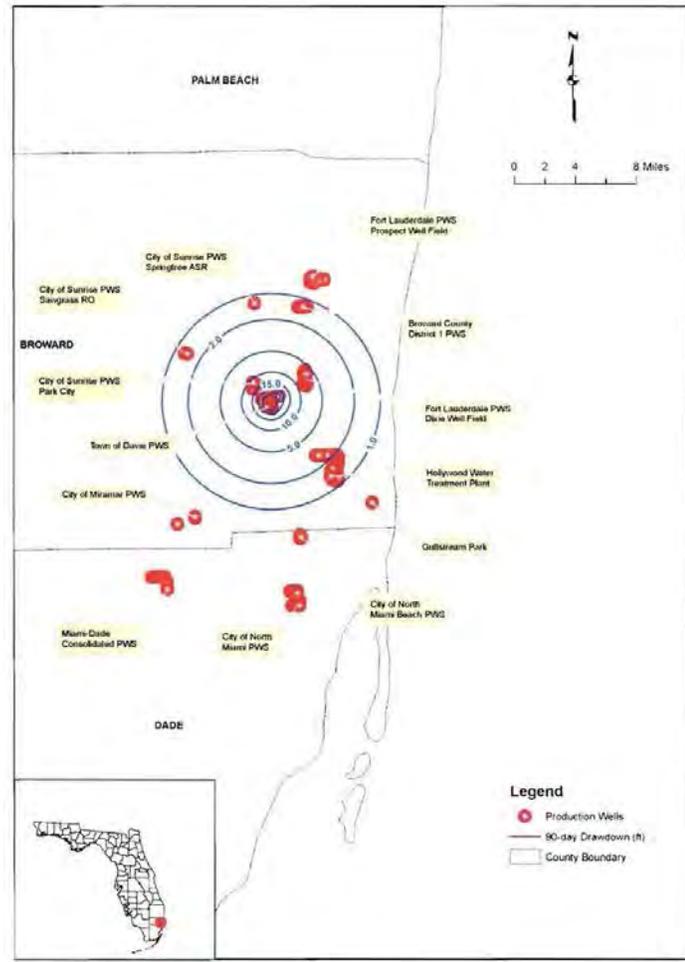


Source: 2010 Water use Permit No. Re-issue 06-00134-WTown-of-Davie-2005-SFWMD-Water Use Renewal Permit Application

Note: Biscayne Aquifer drawdown with withdrawals from Davie wells only

**Figure 3-2**

**Floridan Well Field Locations**



Source: 2010 Water use Permit No. Re-issue 06-00134-W

Note: Upper Floridan Aquifer drawdown with withdrawals from Davie wells only

**3.1.1. Consumptive Use Permit Conditions**

The SFWMD regulates the volume of water that can be withdrawn from groundwater through the use of a Consumptive Use Permit (CUP) according to Part II of Chapter 373 of the Florida Statutes. On ~~October 18, 2010~~ September 14, 2005 the last CUP was issued to the Town by SFWMD and expires ~~October 24, 2030~~ September 14, 2010. The permitted withdrawal amounts are as follows ~~2,0207,244 MG per year (average 5.53419.847 mgd) and 180.0652 MG maximum month (average 5.9221.436 mgd)~~. The Town of Davie shall coordinate with the SFWMD on alternative water supply projects in conjunction with the renewal of the permit. The Town recently issued a Request for Proposals and selected a Design/Build team ~~who to recently completed the design and construction of the necessary AWS facilities to meet the future needs of the residents in the Town's utility service area.~~ The Town of Davie is currently withdrawing an approximate average of ~~3.0334.39 mgd~~ from its wells. The Town of Davie's well information is summarized in **Table 3.1**.

**Table 3.1  
Well Information**

Well No.	Diameter (in)	Depth (ft)	Capacity (gpm)	Location	Year Drilled
1	10	100	550	WTP No. 1	1959
2	10	100	550	WTP No. 1	1961
3	12	133	1050	WTP No. 1	1972
4	12	120	1050	WTP No. 1	1972
5	16	145	900	WTP No. 3	1995
6	20	100	1500	WTP No. 3	1995
7	20	117	1500	WTP No. 3	1986
10	18	100	1500	WTP No. 3	2001

Source: 2005 SFWMD CUP

<u>Well No.</u>	<u>Diameter</u> <u>(in)</u>	<u>Depth</u> <u>(ft)</u>	<u>Capacity</u> <u>(MGD)</u>	<u>Location</u>	<u>Year Drilled</u>
<b>FLORIDAN AQUIFER</b>					
<u>1</u>	<u>16</u>	<u>1650</u>	<u>2.5</u>	<u>WTP No. 5</u>	<u>2012</u>
<u>2</u>	<u>16</u>	<u>1650</u>	<u>2.5</u>	<u>WTP No. 5</u>	<u>2012</u>
<u>3</u>	<u>16</u>	<u>1650</u>	<u>2.5</u>	<u>WTP No. 5</u>	<u>2012</u>
<u>4</u>	<u>16</u>	<u>1650</u>	<u>2.5</u>	<u>WTP No. 5</u>	<u>2012</u>
<u>5</u>	<u>16</u>	<u>1650</u>	<u>2.5</u>	<u>WTP No. 5</u>	<u>2012</u>
<b>BISCAYNE AQUIFER</b>					
<u>1</u>	<u>10</u>	<u>100</u>	<u>0.8</u>	<u>WTP No. 1</u>	<u>1959</u>
<u>2</u>	<u>10</u>	<u>100</u>	<u>0.8</u>	<u>WTP No. 1</u>	<u>1961</u>
<u>3</u>	<u>12</u>	<u>133</u>	<u>1.5</u>	<u>WTP No. 1</u>	<u>1972</u>
<u>4</u>	<u>12</u>	<u>120</u>	<u>1.5</u>	<u>WTP No. 1</u>	<u>1972</u>
<u>5</u>	<u>16</u>	<u>145</u>	<u>1.3</u>	<u>WTP No. 3</u>	<u>1995</u>
<u>6</u>	<u>20</u>	<u>100</u>	<u>2.2</u>	<u>WTP No. 3</u>	<u>1995</u>
<u>7</u>	<u>20</u>	<u>117</u>	<u>2.2</u>	<u>WTP No. 3</u>	<u>1986</u>
<u>10</u>	<u>18</u>	<u>100</u>	<u>2.2</u>	<u>WTP No. 3</u>	<u>2001</u>

Source: 2005 SFWMD CUP and 2013 AECOM Production Well Engineering Report

### 3.2 WATER TREATMENT FACILITIES

The Town of Davie currently operates two water treatment plants with a total permitted design treatment capacity of ~~7.4~~10.0 MGD. Both treatment facilities are currently active and supply services for the eastern part of the Town. The North Treatment Plant (System I) is closed.

**Table 3-2  
Treatment Capacity**

<b>Wellfield Location</b>	<b>WTP Served</b>	<b>Total Installed Capacity (mgd)</b>	<b>Total Installed Firm Capacity (mgd)</b>
South	System (III)	4.0	4.0
North	System (I)	3.4	3.4

<b>Well Field Location</b>	<b>WTP Served</b>	<b>Total Installed Capacity (mgd)</b>	<b>Total Installed Firm Capacity (mgd)</b>
South	System III	4.0	4.0
North	System V	6.0	6.0

Source: Calvin Giordano & Associates, INC. ~~2008~~2014

### 3.2.1 ~~South System III~~ Treatment Plant

The ~~South System (III)~~ treatment plant has a rated capacity of 4.0 MGD and is located south of Stirling Road, at the end of N.W. 76<sup>th</sup> Avenue. There are two 2.0 million gallon finished water storage tanks, and one 142,000 gallon clear well located on the property. The ~~South System III~~ plant is also supplied by four wells located on the property. The water is treated via lime softening, filtration, and ion exchange for color removal and disinfection.

### 3.2.2 ~~North System V~~ Treatment Plant

The ~~System V North~~ Treatment Plant has a rated capacity of ~~3.46.0~~ million gallons per day (MGD), and a permitted allocation of ~~2.63 MGD~~ 14.83 MGD, and is located at 3500 Northwest 76<sup>th</sup> Avenue, Davie FL, 33024 ~~near the intersection of Davie Road and S.W. 38<sup>th</sup> Court.~~

~~The North Treatment Plant is schedule to be closed after a new reverse osmosis (RO) facility is completed. The 12 MGD (ultimate capacity) new reverse osmosis water treatment plant will withdraws withdrawal water from the Floridan Aquifer and it's scheduled to be a developed is located in an area in the central portion of the Town in or near the South Florida Educational Center with an approximate date of completion in 2010.~~

## 3.3 WATER STORAGE FACILITIES

~~The north water treatment plant has two 0.3 million gallon finished water storage tanks located within the plant's vicinities. The South System III water treatment plant has two 2.0 million gallon finished water storage tanks. System V water treatment plant has one 2.5 million gallon finished water storage tank.~~ All storage tanks are currently online and contain service pumps that assist with meeting peak hourly flow and fire flow requirements. **Table 3-3** lists the storage capacity at each location and **Figure 3-3** shows the location of the storage tanks.

**Table 3-3**  
**Storage Capacity**

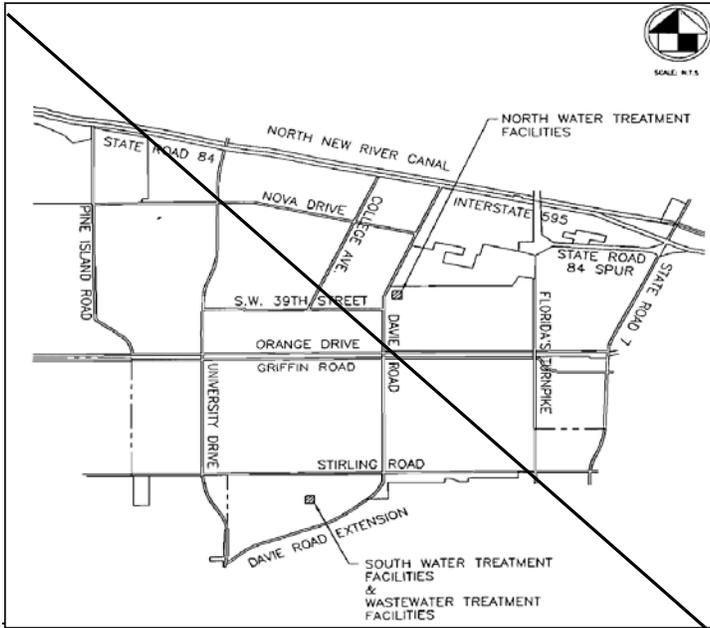
<b>Facility</b>	<b>Capacity (MG)</b>
<b>South</b>	4.0
<b>North</b>	.6
<b>Total</b>	4.6

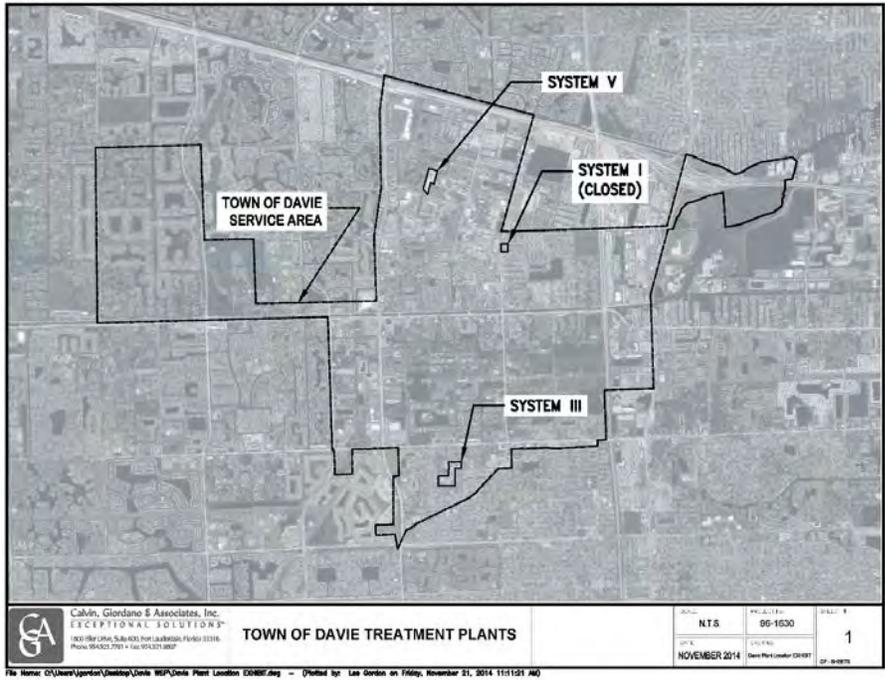
<b>Facility</b>	<b>Capacity (MG)</b>
<b><u>System III</u></b>	<u>4.0</u>
<b><u>System V</u></b>	<u>2.5</u>
<b><u>Total</u></b>	<u>6.5</u>

Source: Calvin Giordano & Associates, INC. 2014

Source: Calvin Giordano & Associates, INC. 2008

**Figure 3-23**  
**Water Treatment Plant and Storage Locations**





Source: Calvin Giordano & Associates, INC. 2014 ~~2005~~ SFWMD Water Use Renewal Permit Application

### 3.4 WATER TRANSMISSION AND DISTRIBUTION SYSTEM

The Utilities Department is responsible for the maintenance and repair of the potable water distribution and sewer collection systems throughout the Town. Currently there are over 127 miles of water lines ranging from 2 inches to 24 inches in diameter, as shown in **Table 3.4**, and over 1100 fire hydrants. Materials on the water distribution system vary from galvanized iron to asbestos concrete to PVC and ductile iron, depending on the age of the system. The oldest water lines exceed sixty years. Most of these water lines are located in the eastern half of the Town and some are made of cast iron. An investigation of the condition of these pipelines should be undertaken (or comments recorded during repairs) to evaluate the state of deterioration of older pipelines and the priority for replacement. Fortunately Town staff advises that some of the 2 inch galvanized iron pipelines have been replaced with 6 inch PVC pipelines. Experience throughout Florida indicates that the acidic soil conditions do not promote long life of galvanized pipelines. Those that have not been replaced tend to be in rear yard alleys that are not easily

accessible. These pipelines are a priority, although they may need to be moved to the front yards.

**Table 3-4**  
**Pipe Inventory**

<u>Item</u>	<u>Units</u>	
<u>2" and under Water Main</u>	<u>45110</u>	<u>LF</u>
<u>4" Water Main</u>	<u>18990</u>	<u>LF</u>
<u>6" Water Main</u>	<u>155490</u>	<u>LF</u>
<u>8" Water Main</u>	<u>192510</u>	<u>LF</u>
<u>10" Water Main</u>	<u>51330</u>	<u>LF</u>
<u>12" Water Main</u>	<u>53400</u>	<u>LF</u>
<u>16" Water Main</u>	<u>23970</u>	<u>LF</u>
<u>18" Water Main</u>	<u>2850</u>	<u>LF</u>
<u>20" Water Main</u>	<u>390</u>	<u>LF</u>
<u>24" Water Main</u>	<u>2280</u>	<u>LF</u>
<u>12" Raw Water Line</u>	<u>10000</u>	<u>LF</u>
<u>5/8 or 3/4" Services</u>	<u>7135</u>	<u>ea</u>
<u>1" Services</u>	<u>175</u>	<u>ea</u>
<u>1-1/2" Services</u>	<u>125</u>	<u>ea</u>
<u>2" Services</u>	<u>110</u>	<u>ea</u>
<u>3" Services</u>	<u>2</u>	<u>ea</u>
<u>4" Services</u>	<u>1</u>	<u>ea</u>
<u>6" Services</u>	<u>3</u>	<u>ea</u>
<u>8" Services</u>	<u>4</u>	<u>ea</u>
<u>Fire Hydrants</u>	<u>1100</u>	<u>ea</u>

Source: Calvin Giordano & Associates, INC. 2008

Asbestos concrete (or transite) pipes are inert, and unless disturbed, pose little risk. A long-term plan should be implemented to evaluate the eventual need for replacement of these pipelines. In addition a plan for dealing with asbestos pipe repairs, and disposal of asbestos pipe needs to be developed.

Most of the Town's service lines, including all of those on replaced water mains, are non-metallic, thereby eliminating corrosion potential. The services attached to the cast iron lines may be constructed with galvanized fittings. These service lines are subject to corrosion and could also be a source of leaks. They should be replaced at the same time as the rest of the pipes. Standard materials for water lines are PVC C900 for the pipe, polyethylene tubing for service lines and brass fittings to connect them. All are appropriate materials. Replacement of galvanized lines has been added to the Capital Improvement Plan (CIP)

Storage on the system is limited to the clear wells and ~~four~~three on-site ground storage tanks.

Daily maintenance includes large user meter readings and repairs to pumps, valves and piping. The Town has recently replaced or overhauled the large meters. This should occur no less than every two years. Town crews repair most breaks, valves and leaks. Fire hydrant testing and repair that includes maintenance, painting and reporting fire flows should be performed annually by the Town.

Maintenance and upgrades to the water meter inventory to maintain these assets in good condition is required. The present meter base is approximately 9300 active accounts. Since the average life for accurate registration is from seven to ten years, Town crews change out many of the oldest meters each year. ~~All large meters appear to have been repaired or replaced in the past two years.~~ Unaccounted for water is low to moderate according to Town staff.

There are several identified areas of low or potentially low pressure. One area is during peak demands near the university campuses. Better interconnect piping between plants would improve the situation. Reinforcement of service to ~~Fernest~~Tyndall Hammock Utilities would also be of benefit. These interconnecting pipes are schedule to be installed within one to three years by large users in the service area.

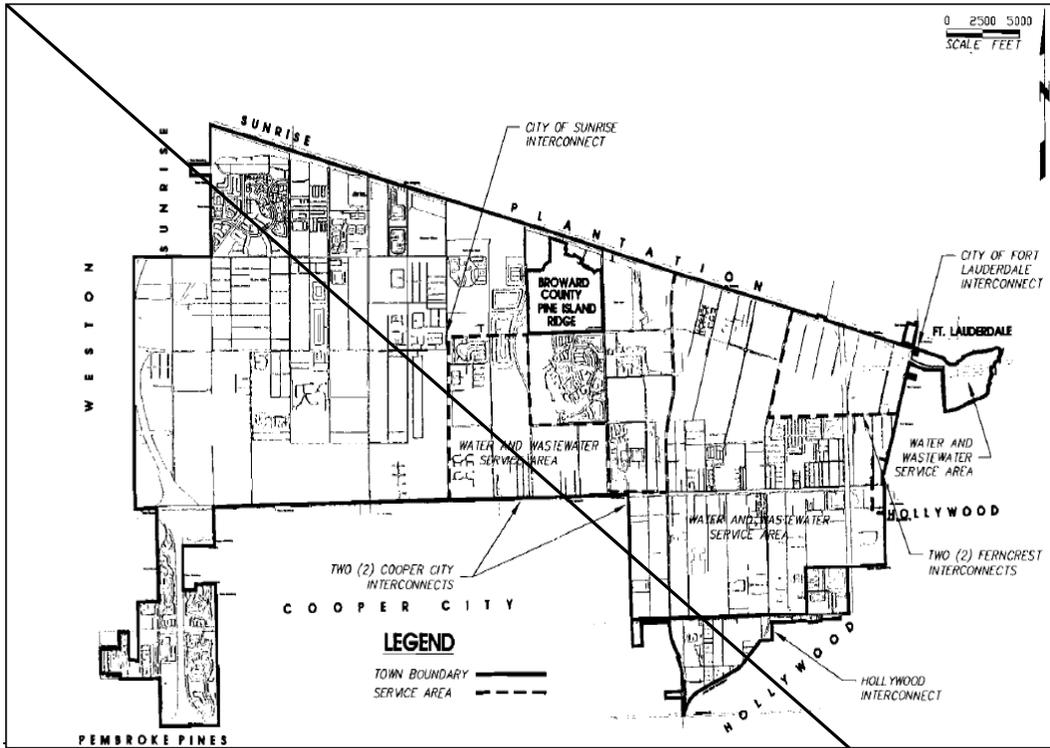
**Figure 3-34** illustrates the existing emergency interconnections within the Town of Davie to other water service providers.

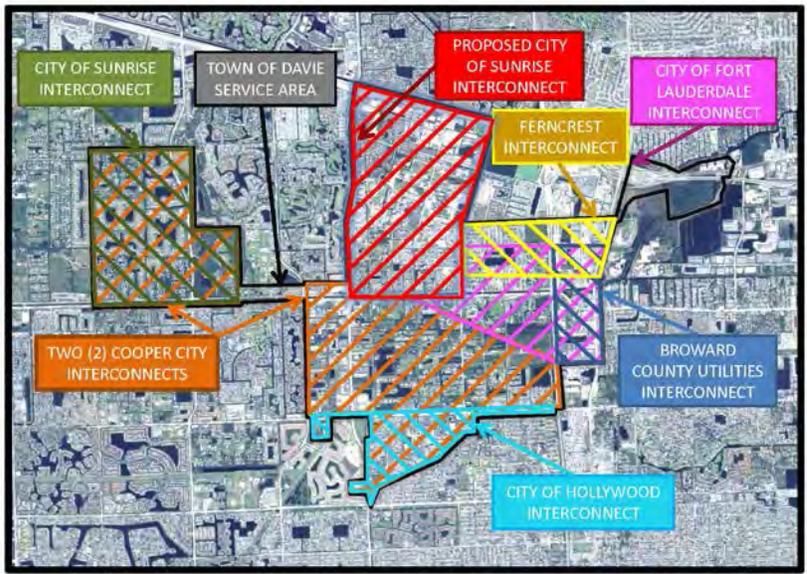
**Table 3-4**  
**Pipe Inventory**

<b>Item</b>	<b>Units</b>	
2" and under Water Main	45110	LF
4" Water Main	18990	LF
6" Water Main	155490	LF
8" Water Main	192510	LF
10" Water Main	51330	LF
12" Water Main	53400	LF
16" Water Main	23970	LF
18" Water Main	2850	LF
20" Water Main	390	LF
24" Water Main	2280	LF
12" Raw Water Line	10000	LF
5/8 or 3/4" Services	7135	ea
1" Services	175	ea
1 1/2" Services	125	ea
2" Services	110	ea
3" Services	2	ea
4" Services	1	ea
6" Services	3	ea
8" Services	4	ea
Fire Hydrants	1100	ea

Source: Calvin Giordano & Associates, INC. 2008

**Figure 3-34**  
**Town of Davie Interconnections**





Source: Calvin Giordano & Associates, INC. 2008~~14~~

## SECTION 4-POPULATION DATA AND ANALYSIS

This section evaluates the historical and future population projections for the Town of Davie Service Area. The development of population projections is a collaborative effort between the Town of Davie, neighboring municipalities and SFWMD. The Town's population numbers used for this For the current Water Supply Plan WSFWP are those generated by the the Town used the Broward County 2013 Population Projection Allocation Update Population Forecasting Model (BCPFM).

~~The BCPFM consists of 2000 Census data and projects 5 year intervals projections by the cohort Survival Methodology. It is our understanding that the Population projections used by the other suppliers (City of Fort Lauderdale, City of Sunrise, Broward County, City of Hollywood, Fernerest Utilities) within the Town also used the BCPFM.~~

~~Population projections for the Town's service area hadve also been developed for the preparation of the 2005 water use permit renewal application of the consumptive use permit from the SFWMD. Those population values are different than those developed by SFWMD and Broward County due to the large number of bulk and large users (Hard Rock Hotel and the schools in the South Florida Educational Center). Those population numbers were generated by converting the bulk and large user flows to a population value by dividing the flows by a 100 gpcd.~~

~~However, the population numbers used in this WSFWP are those generated by Broward County (FAZ 2007) for the Town's water service area.~~

### 4.1 HISTORIC POPULATION DATA

Population within the Town of Davie service area has decreased since the 2009 WSFWP. ~~increased in the last decade.~~ **Table 4-1** presents the estimated historical population within the Town's service area.

**Table 4-1  
Town of Davie Service Area Estimated Historical Population**

<b>Year</b>	<b>Historical Population</b>
2000	25,212
2001	25,884
2002	26,557
2003	27,229
2004	27,901
2005	29,635
2006	30,335
2007	31,034

<u>Year</u>	<u>Historical Population</u>
<u>2010*</u>	<u>27,548</u>
<u>2011</u>	<u>29,561</u>
<u>2012</u>	<u>29,766</u>
<u>2013</u>	<u>29,970</u>
<u>2014</u>	<u>30,174</u>
<u>2015</u>	<u>30,379</u>

Source: Broward County 2013 Population Projection Allocation Update

\*The 2010 population was determined using the map of the area served by the Town of Davie utilities in 2010 and the U.S. Census Bureau 2010 census block data.

#### 4.2 FUTURE POPULATION DATA

Currently, the Town of Davie Utilities uses population projections developed by Broward County. ~~The County's rate of population growth is predicted by BCPFM. The BCPFM consists of 2000 Census data and projects 5 year intervals projections by the cohort Survival Methodology. The cohort Survival Methodology makes the assumption that future population is equal to present population plus births, minus deaths, and net migration. The assumption is applied to various segments of the population based on age, gender, race and ethnicity. The United States Department of the Treasury's Internal Revenue Service (IRS) and the United States Immigration and Naturalization Service (INS) provide domestic migration rates and are both used to estimate international migration. The model methodology has been approved by the State of Florida Department of Community Affairs.~~

Broward County ~~allocates the~~ distributes its population forecasts ~~model results into the County's~~ by Traffic Analysis Zones (TAZ). Unlike municipal boundaries, TAZ boundaries are usually bounded by a major roadway or natural features and are relatively consistent and small in size. ~~The BC TAZ 2005 data was used by the SFWMD in development of population estimates for the LECWSP. Table 4-2a presents the estimated projected population within the Town's service area using the Broward County 2013 Population Projection Allocation Update~~BC TAZ 2007.

**Table 4-2b** presents the estimated projected population for the Town of Davie Utilities service area as per the LEC Plan. The LEC Plan forecast model is based on the Bureau of Economic and Business Research population projections report published in the Florida Population Studies in July 2011 (BEBR 2011). As such, there is a slight variation in the estimated projected population data for the Town of Davie utilities service area due to the different methodologies used. In addition, the LEC forecast model does not take into account two re-development areas in the Town, the Regional Activity Center (RAC) and the Transportation Oriented Corridor (TOC). In general, the RAC encompasses the area between University Drive and Florida's Turnpike and between Orange Drive and I-595. The TOC generally encompasses the area

between US 441 and Florida's Turnpike and between I-595 and The Hard Rock Hotel and Casino.

**Table 4-2bc** presents the estimated projected population and per capita flows for all within the entire Town and includes the other service providers's service areas within the Town.

As we understand it, this forecast model does not take into account two re-development areas in the Town, the Regional Activity Center (RAC) and the Transportation Oriented Corridor (TOC). In general, the RAC encompasses the area between University Drive and Florida's Turnpike and between Orange Drive and I 595. The TOC generally encompasses the area between US 441 and Florida's Turnpike and between I 595 and The Hard Rock Hotel and Casino. These two area's projected water demand will be presented in Section 5 of this report and a total future water demand will be calculated.

**Table 4-2a**  
**Town of Davie Service Area Estimated Projected Population Without RAC and TOC**

<u>YEAR</u>	<u>TAZ Population<sup>(1)</sup></u>
<u>2015</u>	<u>30,379</u>
<u>2016</u>	<u>31,043</u>
<u>2017</u>	<u>31,708</u>
<u>2018</u>	<u>32,373</u>
<u>2019</u>	<u>33,038</u>
<u>2020</u>	<u>33,703</u>
<u>2021</u>	<u>33,978</u>
<u>2022</u>	<u>34,254</u>
<u>2023</u>	<u>34,530</u>
<u>2024</u>	<u>34,806</u>
<u>2025</u>	<u>35,082</u>
<u>2026</u>	<u>35,151</u>
<u>2027</u>	<u>35,220</u>
<u>2028</u>	<u>35,290</u>
<u>2029</u>	<u>35,359</u>
<u>2030</u>	<u>35,428</u>
<u>2031</u>	<u>35,742</u>
<u>2032</u>	<u>36,056</u>
<u>2033</u>	<u>36,370</u>
<u>2034</u>	<u>36,684</u>
<u>2035</u>	<u>36,998</u>

(1) Based on Broward County 2013 Population Projection Allocation Update. Population area is comprised of 2014 TAZ 551, 553, 554, 555, 556, 557, 564, 567, 568, 570, 571, 617, 619, 623, 624, 625, 627, 657, 704, 705, 706, 708

Year	Updated TAZ Population*
2008	31,364
2009	31,547
2010	31,882
2011	32,438
2012	32,994
2013	33,549
2014	34,105
2015	34,661
2016	35,359
2017	36,056
2018	36,754
2019	37,451
2020	38,149
2021	38,758
2022	39,367
2023	39,977
2024	40,586
2025	41,195
2026	41,705
2027	42,216
2028	42,726
2029	43,237
2030	43,747

\*Based 2007 TAZ data of Town of Davie Service Area(Excerpted from AECOM's 2009 Water Use permit Application for the Town of Davie)

**Table 4-2b**  
**2013 Lower East Coast Water Supply Plan**  
**Town of Davie Service Area Estimated Projected Population**

<u>Year</u>	<u>Population <sup>(1)</sup></u>
<u>2010</u>	<u>27,548</u>
<u>2020</u>	<u>59,320</u>
<u>2030</u>	<u>91,091</u>

(1) Based on 2011 Bureau of Economic and Business Research (BEBR) data

**Table 4-2bc**

**Comment [PL1]:** Updated figures not yet available for all utility service providers. To be updated prior to adoption (second reading).

**Town of Davie Service Providers Service Area -Estimated Population and Per Capita  
Flows without TOC and RAC populations and flows**

		<b>SUNRISE</b>				127	Gpdc
<b>Year</b>	<b>2008</b>	<b>2013</b>	<b>2015</b>	<b>2018</b>			
<b>Population</b>	55,700	59,400	60,800	62,500			
<b>Water Demand (MGD)</b>	7.07	7.54	7.72	7.94			

		<b>HOLLYWOOD</b>				122	gpdc
<b>Year</b>	<b>2008</b>	<b>2013</b>	<b>2015</b>	<b>2018</b>			
<b>Population</b>	2,225	2,442	2,531	2,659			
<b>Water Demand (MGD)</b>	0.27	0.30	0.31	0.32			

		<b>FT. LAUDERDALE</b>				42	gpdc
<b>Year</b>	<b>2008</b>	<b>2013</b>	<b>2015</b>	<b>2018</b>			
<b>Population</b>	2,400	2,400	2,400	2,400			
<b>Water Demand (MGD)</b>	0.10	0.10	0.10	0.10			

**\* No irrigation is allowed with potable water so gpdc is lower than other areas of Ft. Lauderdale**

		<b>FERNCREST</b>				144	gpdc
<b>Year</b>	<b>2008</b>	<b>2013</b>	<b>2015</b>	<b>2018</b>			
<b>Population</b>	5845	6304	6304	6304			
<b>Water Demand (MGD)</b>	0.85	0.91	0.91	0.91			

		<b>DAVIE</b>				144	gpdc
<b>Year</b>	<b>2008</b>	<b>2013</b>	<b>2015</b>	<b>2018</b>			
<b>Population</b>	31,364	33,549	34,661	36,754			
<b>Water Demand (MGD)</b>	4.52	4.83	4.99	5.29			

		<b>BROWARD</b>				192	gpdc
<b>Year</b>	<b>2008</b>	<b>2013</b>	<b>2015</b>	<b>2018</b>			
<b>Population</b>	671	709	724	746			
<b>Water Demand (MGD)</b>	0.13	0.14	0.14	0.14			

UTILITY	YEAR	POPULATION	WATER DEMAND (MGD)
<b>BROWARD</b> <sup>(1)</sup> 192 gpd	2015	523	0.13
	2020	528	0.14
	2025	525	0.14
	2030	532	0.14
<b>DAVIE</b> <sup>(2)</sup> 144 gpd	2015	30,379	4.37
	2020	33,703	4.85
	2025	35,082	5.05
	2030	35,428	5.10
<b>FT. LAUDERDALE</b> 170 gpd	2015	528	0.10
	2020	530	0.10
	2025	527	0.10
	2030	534	0.10
<b>HOLLYWOOD</b>	2015	-	-
	2020	-	-
	2025	-	-
	2030	-	-
<b>SUNRISE</b> <sup>(3)</sup> 116 gpd	2015	57,500	6.67
	2020	59,500	6.90
	2025	60,100	6.97
	2030	59,800	6.94
<b>TYNDALL HAMMOCK</b>	2015	-	-
	2020	-	-
	2025	-	-
	2030	-	-

(1) Area includes a portion of the Hacienda Village neighborhood, which comprises TAZ 651

(2) Population area is comprised of 2014 TAZ 551, 553, 554, 555, 556, 557, 564, 567, 568, 570, 571, 617, 619, 623, 624, 625, 627, 657, 704, 705, 706, 708

(3) Population projections from City of Sunrise, Florida 10-Year Water Supply Facilities Work Plan

Source: Adopted 10-yr. WSWFP's and Ferncrest CUP Application (except Town of Davie)

## SECTION 5 – CONFIRMATION OF FLOWS AND DEMAND

This Section 5 is excerpted from AECOM's "Town of Davie Water and Wastewater System Expansion – July 2009 Planning Report" [note: ..... indicates information was removed for brevity, ( ) items in *italics* in parenthesis were added for clarity]

This section is a summary of the collection and review of existing data and reports, including the 2007 Utilities Master Plan, ....., wastewater daily monitoring reports (DMR) and WTP monthly operating reports (MOR). There have also been numerous meetings with the Town Planning and Zoning Department to confirm and agree on appropriate growth projections for the TOC and RAC re-development areas.

**Historical Flows**

DMR's for the Town's WWTP and MOR's for both Systems IV and III water treatment plants were reviewed and analyzed to determine the past wastewater and water usage, respectively.

**Water**

Systems II and III produced a total daily average of approximately ~~4.384~~4.24 MGD in the year ~~2008~~2013. Since ~~2006~~2011, there has been a reduction in water demand in comparison to the population growth. This reduction could potentially be attributed to the Town's water conservation program and the institution of water restrictions by the SFWMD in recent years.

**Table 5.1** presents the Town of Davie's total average water production for the last ~~five~~three years.

**Table 5.1: Historic Yearly Treated Water (System I and III)**

<u>Year</u>	<u>Treated Water Supplied (MG)</u>	<u>Average Day Treated Water (MGD)</u>
<u>2004</u>	<u>1,676</u>	<u>4.58</u>
<u>2005</u>	<u>1,652</u>	<u>4.54</u>
<u>2006</u>	<u>1,696</u>	<u>4.65</u>
<u>2007</u>	<u>1,591</u>	<u>4.37</u>
<u>2008</u>	<u>1,603</u>	<u>4.38</u>

<u>Year</u>	<u>Treated Water Supplied (MG)</u>	<u>Average Day Treated Water (MGD)</u>
<u>2009</u>	<u>1,603</u>	<u>4.396</u>
<u>2010</u>	<u>1,497</u>	<u>4.099</u>
<u>2011</u>	<u>1,519</u>	<u>4.18</u>
<u>2012</u>	<u>1,449</u>	<u>4.17</u>
<u>2013</u>	<u>1,543</u>	<u>4.24</u>

**Wastewater**

The Utilities wastewater flows are currently in the range of ~~3.53~~4 to 4.4 MGD on an average annual basis for the past 5 years. Peak flows are reported to be heavily influenced by infiltration and inflow (I/I), particularly in the north portion of the collection system near the university campuses. The utility ~~is currently planning to~~has upgraded the WWTP ~~which will increase treatment to a treatment~~ capacity from 5 MGD to 7-8.5 MGD on an annual average basis. ~~It is anticipated that this~~The upgrade ~~could be~~was completed ~~within the next couple of years if the Town decides to move forward with the expansion in 2014~~. **Table 5.2** presents daily average flows based on data from the last five years of DMR's.

**Table 5.2: Historic Yearly Wastewater Flows**

<b>Year</b>	<b>Average Daily Flow (MGD)</b>
2004	3.50
2005	3.93
2006	3.88
2007	3.45
2008	3.51

<b>Year</b>	<b>Average Daily Flow (MGD)</b>
2009	3.57
2010	3.46
2011	3.47
2012	3.50
2013	4.24

***FORECAST OF DEMAND Forecast of Demand***

The water and wastewater demand were projected by using future population forecast for the Town of Davie Service Area. .... The County's rate of population growth is predicted by Broward County Population Forecasting Model (BCPFM). The BCPFMM consists of 2000 Census data and projects 5 year intervals projections by the cohort Survival Methodology. The cohort Survival Methodology makes the assumption that future population is equal to present population plus births, minus deaths, and net migration. This methodology has been approved by the State of Florida Department of Community Affairs.

Broward County allocates the population forecast model results into the County's Traffic Analysis Zones (TAZ). TAZ boundaries are usually bounded by a major roadway or natural features and are relatively small in size. Residential land use and non-residential development, such as commercial, industrial, etc. are typically accounted for when TAZ data are developed for projections. Populations from TAZ data from .....2007<sup>14</sup> were used .....to estimate projected population within the Town's Service Area. (See Figure 5.1)

**Population Projection**

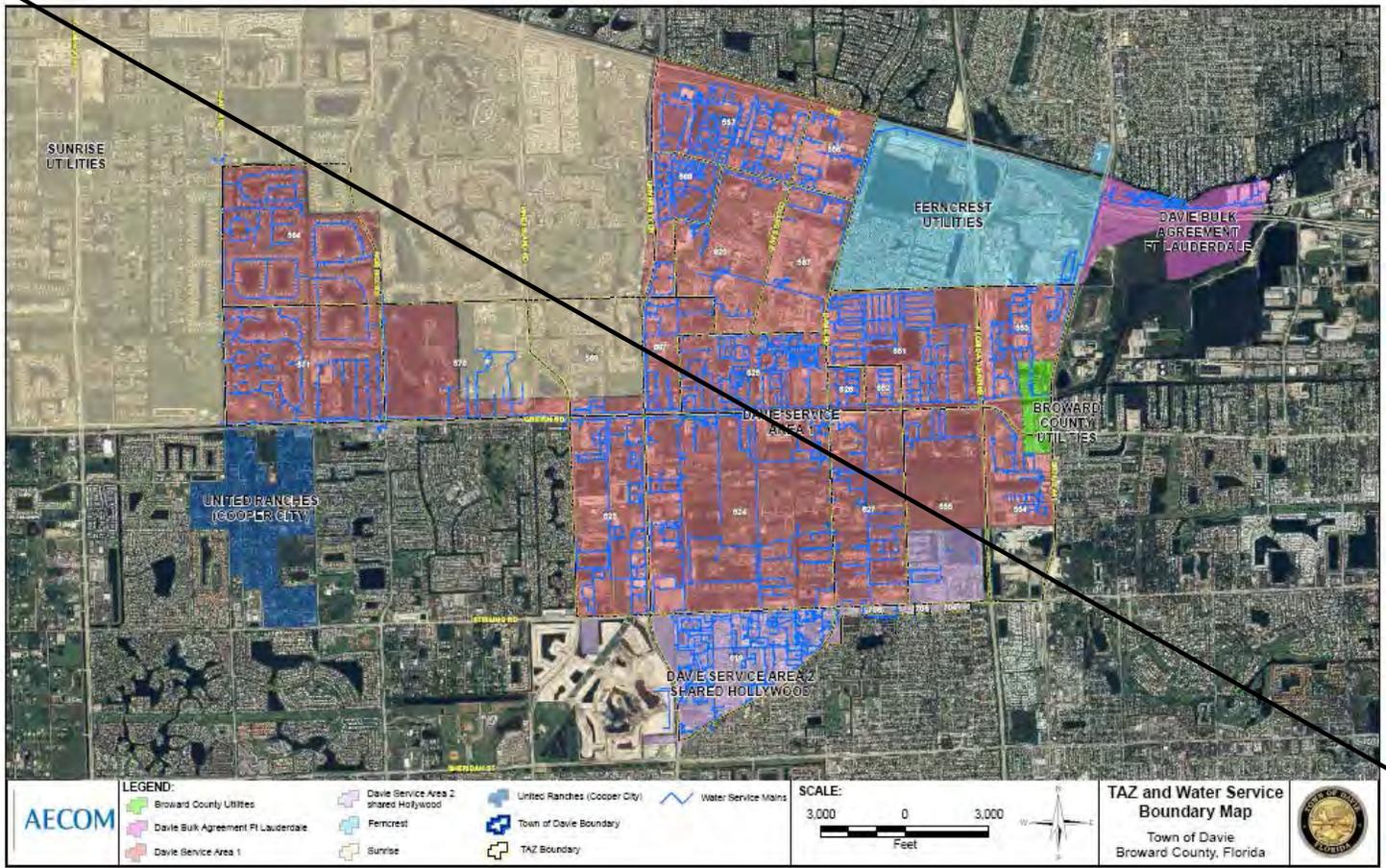
For the purpose of this project and the 20-year Water Use Permit, population projections are required to the year 2030. ....Therefore, AECOMCGA obtained more recently updated

200714 TAZ data. As shown below in **Table 5.3**, the more updated TAZ population data for the Town's Service Area *(were used)*.

**Water**

The population projections presented above were used to project the potable water needs for the future. A per capita usage of 141 gallons per capita per day (gpd) was calculated by analyzing historical records and averaging data from the years 2011 to 2013. Historical maximum day water demand was also analyzed for the years 2011 to 2013 and compared against the average day demand for the same three year period. A maximum day peaking factor of 1.84 was calculated by dividing the average day demand into the maximum day demand. Maximum day projections were then calculated by multiplying the projected average day flow by the peaking factor of 1.84.

**Table 5.4** shows the average annual day and maximum day demand projections for the Town of Davie Service Area. Total demand projections by year throughout the 20-year planning period are summarized for average day and maximum day in columns 3 and 4 respectively.



(Figure 5.1 TAZ and Water Service Boundary Map (Please see enlarged map at end of report))

**Table 5.3 – Population Projection**

<b>Year</b>	<b>Updated TAZ Population*</b>
2008	31,364
2009	31,547
2010	31,882
2011	32,438
2012	32,994
2013	33,549
2014	34,105
2015	34,661
2016	35,359
2017	36,056
2018	36,754
2019	37,451
2020	38,149
2021	38,758
2022	39,367
2023	39,977
2024	40,586
2025	41,195
2026	41,705
2027	42,216
2028	42,726
2029	43,237
2030	43,747

<b>Year</b>	<b>Updated TAZ Population*</b>
2015	30,379
2016	31,043
2017	31,708
2018	32,373
2019	33,038
2020	33,703
2021	33,978
2022	34,254
2023	34,530
2024	34,806
2025	35,082
2026	35,151
2027	35,220
2028	35,290
2029	35,359
2030	35,428
2031	35,742
2032	36,056
2033	36,370
2034	36,684
2035	36,998

\*Based 200714 TAZ data of Town of Davie Service Area

It is important to note that TAZ's do not take into account redevelopment in the RAC and TOC. The Town's Planning and Zoning Division was able to provide us with updated land use projections for the TOC and RAC. For the TOC, it is anticipated that the proposed land use will generate an additional 6,200 dwelling units over a 20 year period. In the RAC, there are 22,000 additional dwelling units expected to be developed in the next 50 years. **Table 5.4** presents the Planning Division's estimate of the distribution of dwelling units for the RAC over a 50-year period.

**Table 5.4: RAC Unit Distribution**

Total Units	10-Years 30% of Overall	25-years 35% of Overall	50-Years 35% of Overall
22,000	6,600	7,700	7,700

Based on the Town's average of 2.64 people per household from the 2000 Census, the populations of the RAC and TOC were estimated and added to the Town's TAZ population to determine total Service Area population. **Table 5.5** presents the estimated population projection of the Town's Service Area. For the purposes of projections in this report, the Town has advised that redevelopment is expected to start in 2010 and 2011 for the TOC and RAC, respectively.

**Table 5.5: Town of Davie Service Area Population Projection**

Year	TAZ Projected Population	RAC Population	TOC Population	Total Projected Service Area Population
2009	31,547			31,547
2010	31,882		818	32,700
2011	32,438	1,742	1,637	35,817
2012	32,994	3,485	2,455	38,934
2013	33,549	5,227	3,274	42,050
2014	34,105	6,970	4,092	45,167
2015	34,661	8,712	4,910	48,283
2016	35,217	10,454	5,729	51,400
2017	35,773	12,197	6,547	54,517
2018	36,329	13,939	7,366	57,634
2019	36,885	15,682	8,184	60,751
2020	37,441	17,424	9,002	63,867
2021	37,997	19,166	9,821	67,004
2022	38,553	20,908	10,639	70,141
2023	39,109	22,650	11,458	73,278
2024	39,665	24,392	12,276	76,415
2025	40,221	26,134	13,094	79,552
2026	40,777	27,876	13,913	82,689
2027	41,333	29,618	14,731	85,826
2028	41,889	31,360	15,550	89,000
2029	42,445	33,102	16,368	92,173
2030	42,999	34,844	17,187	95,340

As previously noted, TAZ population data takes into account non residential land use in its projections. However, the RAC and TOC populations presented in the table above do not include the redevelopment of non residential land in those areas. Below is the expected redevelopment of non residential land in the RAC over a 50 year period:

Commercial ————— 9,600,203 sq. feet  
 Industrial ————— 2,456,853 sq. feet  
 Community Facilities ——— 6,980,780 sq. feet

**Table 5.6** presents the anticipated build out distribution of non residential land in the RAC.

**Table 5.6 — RAC Non-Residential Build-Out Distribution**

Category	20-Years	40-years	50-Years	Total
Commercial (ft <sup>2</sup> )	5,485,830	1,371,458	2,742,915	9,600,203
Industrial (ft <sup>2</sup> )	982,741	982,741	491,371	2,456,853
Community Facilities (ft <sup>2</sup> )	5,170,948	1,551,284	258,547	6,980,780

The TOC's non residential land development in Davie over a 20 year period is distributed in the following categories:

Commercial ————— 500,000 sq. feet  
 Industrial ————— 1,200,000 sq. feet  
 Office Building ——— 1,700,000 sq. feet  
 Hotel ————— 750 rooms

This non residential land use is later converted into projected flow demand and included in water demand projections in sections to follow.

**Water**

The population projections presented above were used to project the potable water needs for the future. A per capita usage of 1414 gallons per capita per day (gpcd) was calculated by analyzing historical records and averaging data from the years 2006-2011 to 2008-2013. This per capita usage is mainly a result of the usage of more recent MOR's and updated population data. The Town's comprehensive plan states that Level of Service for Davie is 150 gpcd. (The three (3) year average as opposed to the five (5) year average was used due to the expectation of continued water restrictions by the SFWMD, consumer educational programs in place stressing the need to conserve water as well as the increase in the cost of water and sewer service)

Water demand for non-residential land in the RAC and TOC has been estimated using unit flow factors for the various land uses anticipated in these re-development areas. Based on the following unit factors, it is estimated that the water demand, on an average annual day basis, for the new development of non-residential land in the RAC and TOC will be 1.97 MGD and 0.71 MGD, over a 20-year period, respectively, or a total of 2.68 MGD as shown in **Table 5.7**.

**Table 5.7: RAC and TOC Non-Residential Water Demand**

Category	Unit Factor	TOC	RAC	Flow (MGD)
Commercial:	0.2 gpd/ft <sup>2</sup>	500,000	5,485,830	1.20
Industrial:	0.1 gpd/ft <sup>2</sup>	1,200,000	982,741	0.22
Community Facilities:	0.15 gpd/ft <sup>2</sup>	-	5,171,948	0.78
Office:	0.2 gpd/ft <sup>2</sup>	1,700,000	-	0.34
Hotel:	200 gpd/room	750	-	0.15
<b>Total Flow</b>				<b>2.68</b>

Historical maximum-day water demand was also analyzed for the years 2006<sup>11</sup> to 2008<sup>13</sup> and compared against the average day demand for the same three-year period. A maximum-day peaking factor of 1.84<sup>32</sup> was calculated by dividing the average day demand into the maximum day demand. Maximum-day projections were then calculated by multiplying the projected average day flow by the peaking factor of 1.84<sup>32</sup>.

**Table 5.8** shows the average annual day and maximum day demand projections for the Town of Davie Service Area. The RAC and TOC non-residential flow projections are linearly distributed over the planning period, starting in 2011 for the RAC and 2010 for the TOC. Total demand projections by year throughout the 20-year planning period are summarized for average day and maximum day in columns 53 and 46 respectively.

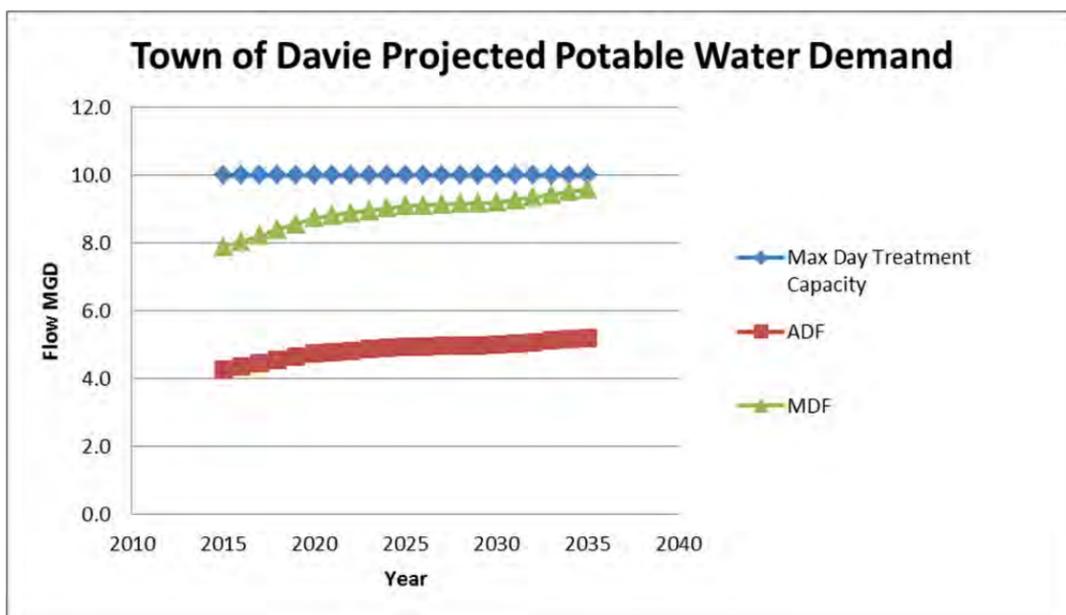
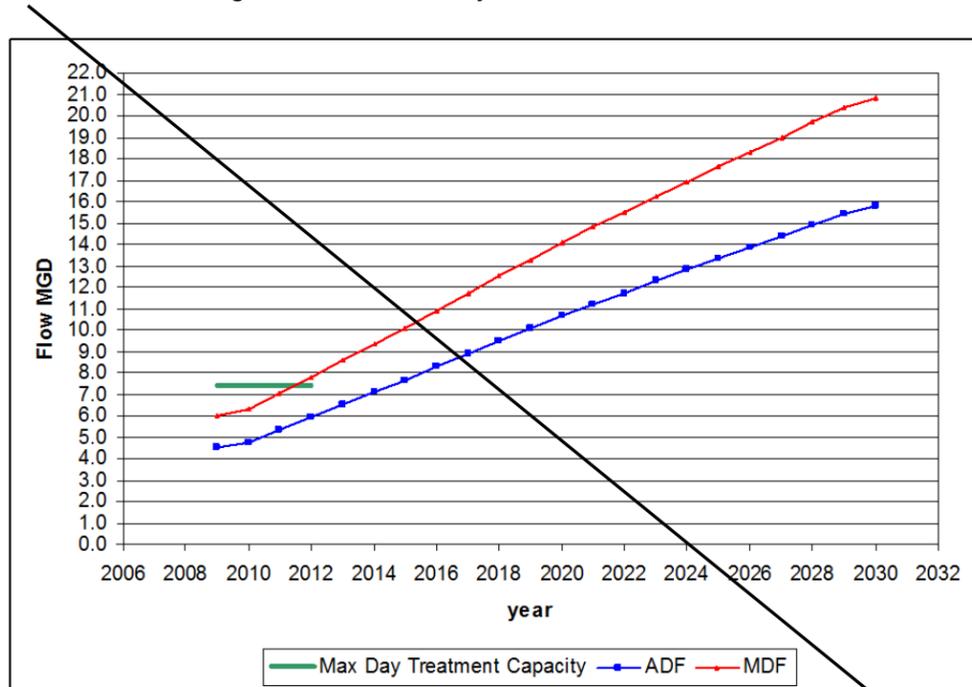
**Table 5.48: Potable Water Demand Projections**

<b>Year</b>	<b>Projected Population</b>	<b>Population-Based Avg. Day Demand (MGD)</b>	<b>Total Avg. Day Demand (MGD)</b>
2009	31,547	4.54	4.54
2010	32,700	4.71	4.74
2011	35,817	5.16	5.33
2012	38,934	5.61	5.91
2013	42,050	6.06	6.49
2014	45,167	6.50	7.08
2015	48,283	6.95	7.66
2016	51,542	7.42	8.26
2017	54,800	7.89	8.87
2018	58,059	8.36	9.47
2019	61,317	8.83	10.07
2020	64,575	9.30	10.67
2021	67,358	9.70	11.21
2022	70,141	10.10	11.74
2023	72,924	10.50	12.28
2024	75,707	10.90	12.81
2025	78,489	11.30	13.35
2026	81,173	11.69	13.87
2027	83,857	12.08	14.39
2028	86,541	12.46	14.91
2029	89,225	12.85	15.43
2030	91,091	13.12	15.80

<b>Year</b>	<b>Projected Population</b>	<b>Population-Based Avg. Day Demand (MGD)</b>	<b>Total Max. Day Demand (MGD)</b>
<u>2015</u>	<u>30,379</u>	<u>4.28</u>	<u>7.88</u>
<u>2016</u>	<u>31,043</u>	<u>4.38</u>	<u>8.05</u>
<u>2017</u>	<u>31,708</u>	<u>4.47</u>	<u>8.23</u>
<u>2018</u>	<u>32,373</u>	<u>4.56</u>	<u>8.40</u>
<u>2019</u>	<u>33,038</u>	<u>4.66</u>	<u>8.57</u>
<u>2020</u>	<u>33,703</u>	<u>4.75</u>	<u>8.74</u>
<u>2021</u>	<u>33,978</u>	<u>4.79</u>	<u>8.82</u>
<u>2022</u>	<u>34,254</u>	<u>4.83</u>	<u>8.89</u>
<u>2023</u>	<u>34,530</u>	<u>4.87</u>	<u>8.96</u>
<u>2024</u>	<u>34,806</u>	<u>4.91</u>	<u>9.03</u>
<u>2025</u>	<u>35,082</u>	<u>4.95</u>	<u>9.10</u>
<u>2026</u>	<u>35,151</u>	<u>4.96</u>	<u>9.12</u>
<u>2027</u>	<u>35,220</u>	<u>4.97</u>	<u>9.14</u>
<u>2028</u>	<u>35,290</u>	<u>4.98</u>	<u>9.16</u>
<u>2029</u>	<u>35,359</u>	<u>4.99</u>	<u>9.17</u>
<u>2030</u>	<u>35,428</u>	<u>5.00</u>	<u>9.19</u>
<u>2031</u>	<u>35,742</u>	<u>5.04</u>	<u>9.27</u>
<u>2032</u>	<u>36,056</u>	<u>5.08</u>	<u>9.35</u>
<u>2033</u>	<u>36,370</u>	<u>5.13</u>	<u>9.44</u>
<u>2034</u>	<u>36,684</u>	<u>5.17</u>	<u>9.52</u>
<u>2035</u>	<u>36,998</u>	<u>5.22</u>	<u>9.60</u>

**Figure 5.1** illustrates the projected water demand, the average day flow (ADF) and maximum day flow (MDF) for the Town and compares it to the current maximum treatment capacity of 7.410.0 MGD. ....

Figure 5.1 Town Davie Projected Potable Water Demand



As shown above, projected growth in the Town of Davie does not require additional will result in the need for additional water treatment capacity between 2015 and 2035 between 2011 and 2012. This need is illustrated in Figure 5.2 where the green line intersects the MDF (red line). (The Town currently is preparing a water use permit application to allow the future withdrawal of Floridan Aquifer water to meet the Town's future water use needs. The Town would request an extension of the current raw water withdrawal permit at the currently permitted amounts until the new Floridan Aquifer reverse osmosis plant is online which is expected to be completed in/by 2011.)

**SECTION 6: CAPITAL IMPROVEMENTS6 WATER SUPPLY FACILITIES WORK PLAN**

The Town of Davie's service area future treatment schemes and distribution system improvements are compiled in this Section. The projections presented in Section 4 and raw water demands in section 5 are used as the basis for Capital Improvements. this Water Supply Facilities Work Plan.

**6.1 TRADITIONAL WATER SUPPLY PROJECTS**

Currently the Town of Davie has existing Biscayne Aquifer wells that provide a sustainable yield and a permitted treatment capacity of 7.4 mgd. Due to the enacted water supply availability rule in 2007, the SFWMD is limiting the amount of water withdrawals from the Biscayne Aquifer.

**6.2 ALTERNATIVE WATER SUPPLY DEMANDS**

Currently the Town of Davie has existing Biscayne Aquifer wells and Floridan Aquifer wells that provide a sustainable yield and a permitted treatment capacity of 10.0 mgd. Due to the enacted water supply availability rule in 2007, the SFWMD is limiting the amount of water withdrawals from the Biscayne Aquifer. As such, future work plan projects will focus namely on alternative water supply projects rather than traditional water supply projects in order to meet projected demand. Table 5-8 demonstrates the need for alternative water supplies due to population projections within the Town of Davie's service area, both with and without the RAC and TOC demands added. The total average day demand projected to be needed through the 20305 planning period is within the next 10 years is approximately 10.075.22 MGD according to population growth within the Town of Davie utility service area with the additional RAC and TOC demands added. The future RO facility using the Floridan Aquifer as the raw water source is more than adequate to supply the future needs in the Town's service area.

**6.13 ALTERNATIVE WATER SUPPLY PROJECTS**

The Town constructed a new reverse osmosis treatment plant with Floridian wells and deep effluent disposal wells to handle the reject water from the reverse osmosis treatment system. The new treatment building houses the instrumentation, filtration units, pumps and chemical feed equipment. Additional equipment i.e., skids and pumps could be installed in the future to expand the system. The North Treatment Plant is schedule to be decommissioned sometime after a new reverse osmosis (RO) facility is completed. The new reverse osmosis water treatment plant will withdrawals water from the Floridan Aquifer and it's scheduled to be a developed has been constructed in an area in the central portion of the Town in or near the South Florida Educational Center with an approximate date of completion in 2010/11. The project is to be phased with 4.6 MGD of capacity installed in 2010/11 and an additional 8.6 MGD of capacity at a later date.

This has would allowed the phasing out of the System North water treatment plant when it has reached its serviceable life while allowing the Town to continue the use of the existing south 4.0 MGD lime softening treatment plant. The Town will construct a new reverse osmosis treatment plant that would require Floridian wells and deep effluent disposal wells to handle the reject water from the reverse osmosis treatment system. A new treatment building housing the instrumentation, filtration units, pumps and chemical feed equipment would also be required. Additional equipment i.e., skids and pumps could be installed in the future to expand the system.

The construction cost estimate to implement the first 4.6 MGD of the 12 MGD ultimate capacity reverse osmosis treatment plant would be was approximately \$309.5 million dollars. This includes a reverse osmosis treatment plant, concentrate disposal wells, instrumentation, filtration units, pumps, and chemical feed equipment. The present value for this Option is \$38.1 million dollars. This facility is being has been constructed in conjunction with a new wastewater treatment facility co-located on the site and sharing the effluent disposal deep well infrastructure.

In addition to the RO treatment plant, all several other water suppliers except Ferncrest Tyndall Hammock Utilities (a.k.a. Tyndall Hammock Utilities) within the Town have indicated in their WSFWP's that they are pursuing alternative water supplies, as well as increased conservation. This will provide adequate water supplies to the Town's residents supplied by these providers. Ferncrest Tyndall Hammock Utilities, based on their current 20 year water use permit, has sufficient water to provide service to its customers. The following table lists the proposed methods for water suppliers within the Town to provide alternative water supplies to its customers.

**Table 6.1  
Water Providers AWS Projects**

<u>PROVIDER</u>	<u>AWS method</u>	<u>AWS method</u>	<u>AWS method</u>
<u>Davie</u>	<u>Conservation - (unknown capacity)</u>	<u>Floridan Aquifer - 6 MGD at new WTP (Firm Capacity)</u>	<u>Reuse - 2 MGD (firm Capacity)</u>
<u>Sunrise</u>	<u>Conservation - 0.75 MGD (Firm capacity)</u>	<u>Floridan Aquifer - 6.4 MGD (Firm Capacity)</u>	<u>Reuse - 1.6 MGD (Firm Capacity)</u>
<u>Ft. Lauderdale</u>	<u>Conservation - Expect 10% reduction - (Firm capacity)</u>	<u>Floridan Aquifer - 6 MGD at Peele Dixie Plant (Firm capacity)</u>	<u>Reuse - Various Projects (unknown capacity)</u>
<u>Hollywood</u>	<u>Conservation - 0.85 MGD (by 2027)</u>	<u>Floridan Aquifer - 6 MGD (Firm capacity)</u>	<u>Reuse - 1.11 MGD (additional Reuse customers and modification of existing system)</u>
<u>Broward County</u>	<u>Purchases water from Hollywood for resale to District 3A customers</u>	<u>See Hollywood AWS projects</u>	
<u>Tyndall Hammock</u>	<u>None needed - 20 year permit issued</u>		

**6.24 ALTERNATIVE WATER SUPPLY CAPITAL IMPROVEMENT DEVELOPMENT SCHEDULE**

During November and December of 2007 the Town Council held public workshops and during public Council meetings approved the results of a utility rate study that was completed. They implemented rates and other connection type of fees to fund future infrastructure improvements (see Appendix A – ORDINANCE NO. 2007-38 which changed these rates, fees and charges on 12/17/07). The Town authorized staff by RESOLUTION NO. R-2008-111 on 6/4/08 to secure bonds, loans and grants as needed to complete the facilities inclusive of alternative water supply projects. The Town has authorized completed the following improvements improvements to be constructed as follows:

1. 4. System IV Wastewater Treatment Facility (WWTF) [6 mgd ultimate capacity] with treatment sufficient to discharge all or portions of the re-purified water to surface or ground water or as irrigation water. The effluent from this facility could recharge the Biscayne Aquifer through discharge to surface or ground water as well as through some amount of irrigation reuse. Effluent not treated to reuse standards will be discharged to new deep injection wells to be constructed as part of this project.
2. System V Water Treatment Plant (WTP) 6 MGD currently constructed [12 mgd ultimate capacity] using the Floridan Aquifer as the raw water source. Reject water from this reverse osmosis treatment plant will be disposed of in deep injections wells to be constructed as part of this project. The Town's System North WTP is scheduled to be de-commissioned when this treatment facility is online.

This facility uses Biscayne Aquifer water; so upon decommissioning of the North System I WTP, the Biscayne Aquifer withdrawals are expected to decrease. The South System III WTP is expected continue to stay online.

The preliminary schedule is to have Phase 1 of the WTP completed by the end of 2010 and Phase 1 of the WWTF completed by end of 2012. It is expected that effluent from the new WWTF could be reused and that the City of Hollywood would continue to reuse the effluent transmitted from the existing WWTF. The Town of Davie has developed a Capital Improvement Program as part of the recently completed rate study. Exhibit A of Resolution NO. R 2008 111 (See Appendix B) excerpts the Utilities Infrastructure portion of the CIP.

In July of 2008 a request for qualifications was placed in a local newspaper for a design/build team to complete design and construction of the new water treatment facilities. Qualification packages were received and presentations to the Town were heard September 29<sup>th</sup> 2008. On October 15<sup>th</sup>, 2008 the Town Council approved of negotiations with a design/build firm to complete design and construction of the new reverse osmosis facilities. A contract has been let and the 1<sup>st</sup> phase of the project to prepare a guaranteed maximum price (GMP) for presentation to the Town has started. Currently, a contract has been let with a well driller and they are currently in the process of drilling a Floridan test well. This well, if successful, would likely be converted to a production well upon completion of the 1<sup>st</sup> phase of the new WTP construction.

Table 6-21 outlines the schedule of capital improvements for the Town of Davie over the next five years as it relates to water supply infrastructure improvement projects, recommended improvements, funds needed as well as funding sources for the improvements. This table is excerpted from the rate study performed and the basis of the rates and fees implemented in ORDINANCE NO. 2007-38 (Appendix A)

**Table 6-21**  
**Capital Improvement Program**

<u>Project</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>Funding Source</u>
<u>Tyndall Hammock Master Meter Installation</u>	<u>\$200,000</u>					<u>Utilities Contribution Charges and Impact Fees</u>
<u>Water and Sewer Line Installation (SW 83 Terrace)</u>	<u>\$530,000</u>					<u>Utilities Contribution Charges and Impact Fees</u>
<u>Water Main Replacement</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>Utilities Capital Replacement Account</u>

Source: ~~Public Resources Management Group, Inc.~~ Town of Davie FY2015-2024 Capital Improvement Program

## **6.5 CONSERVATION PROGRAMS SECTION 7: WATER CONSERVATION AND REUSE**

The Town of Davie is implementing several conservation programs to actively and passively reduce the per capita water demand. The following actions have been implemented:

- The Town of Davie ~~implements has~~ a leak detection program and maintains their water distribution system continually. Recent calculations have determined that the unaccounted for water loss ~~was is~~ approximately ~~6.27%–9.62%~~ in 2012 and 7.60% in 2013.
  - Current rate structure promotes water conservation with a conservation rate structure requiring a gallonage charge when a single-family residence exceeds a preset volume of water.
  - When the South Florida Water Management District institutes Phase I or Phase II water restrictions the Town reduces the allotted ranges of water consumption from the base block user to the final block user, and the surcharge of 25% and 50% is still added to the gallonage portion of the bill. The adjustments to the block rates and the surcharges relay to customers the value of water through monetary consequences.
  - Public Information Program informs citizens on water conservation issues by way of legislation, pamphlets, and bill notifications. The Town enforces legislation intended to increase water conservation awareness among its citizens. Town Ordinance No. 96-27 and Broward County Zoning Code 39-78 both require irrigation systems be designed with rain shut off valves, rain sensors, moisture sensors, electric or hydraulic solenoid valves that will override the irrigation cycle when adequate rainfall has occurred. The Town of Davie Ordinance 98-028 restricts landscape watering to between 4:00 PM and 10:00 AM. Broward County Ordinance No. 91-8 permanently eliminates outside irrigation between the hours of 9 AM and 5 PM, and also restricts restaurants from serving water to customers unless asked for by the patron.
  - The Town of Davie Utility Department supplies pamphlets on water conservation for in home and outdoors. These pamphlets are displayed on a kiosk at the utility's billing department and at the ~~south~~System III and System V water treatment plants. The pamphlets highlight what the consumer can do to improve water conservation efforts and provide factual information on the water supply.
  - In addition to pamphlets and legislation, the Town of Davie Utility Department includes a notification on the customer's monthly billing statement stressing the importance of water conservation. The Town prints these reminders on the customer's monthly water bill each year during the seven (7) month period of November through May.
  - On ~~September 07, 2010~~June 19, 1996, the Town of Davie adopted Town Ordinance No. ~~2010-02096-27~~ to comply with Chapter 373.185 Florida Statutes. This Ordinance provides provisions for site landscaping and outlines mandatory principles of xeriscaping and Florida-Friendly Landscaping practices that must be incorporated into the landscape design. The Town's Planning and Zoning ~~Division~~Department reviews the developers landscape plans and requires that each project be inspected for full compliance.
  - ~~The Town of Davie automatically adopts all County Wide Ordinances passed by the Broward County Commission.~~ In February of 1991, the County adopted a very comprehensive Water Conservation Ordinance No. 91-8. This Ordinance contains procedures on all water shortages and water shortage emergencies declared by the District. In addition, it outlines permanent restrictions on landscape irrigation. Under Ordinance No. 91-8, violations of any provision will result in civil penalties. The Ordinance allows all County and Municipal police officers to enforce the Code.
- The Town also abides by all Broward County Zoning Code regulations ~~such as Section 39-78 of the Broward County Zoning Code~~ that stipulates measures to conserve water usage through landscaping and irrigation. ~~The Code requires the 100% coverage and 100% overlap, the design to minimize application of water to impervious areas, the installation of rain sensors, and the use of safe non-potable water if obtainable.~~
- The Town of Davie has adopted a new "ultra-low" volume plumbing fixture standard by virtue of its mandatory adoption of the FLORIDA BUILDING CODE.
  - All filter backwash water produced during the treatment process is recycled at ~~the North System I and the South~~System III (System III) Water Treatment Plants.
  - ~~The north water treatment plant houses six (6) high service pumps and the south~~System III water treatment plant houses five (5) high service pumps. Under normal conditions, the pumps are operated to maintain approximately 65 psig at each plant, or that pressure mandated by the SFWMD during draught conditions. However, by shutting down one of the larger pumps or two of the smaller pumps the operators can control the pressure at the plants and reduce the distribution system pressure. The reduction in distribution pressure helps reduce water consumption.
  - System IV generates 2 million gallons per day of reuse water.

## **6.6 REUSE PROGRAM**

The Town of Davie has no current off site wastewater reuse system of its own for its existing System II treatment facility. The plant is relatively new and the service area is mostly residential, commercial, and industrial in the eastern portion. Water resources for the municipal water system have been plentiful in the past therefore there was no incentive to install a wastewater reuse system. However, the cities of Cooper City, Davie, and Hollywood entered into a Large User Effluent Disposal Agreement, dated June 17, 1992. The agreement requires the Town of Davie to discharge 2.3 MGD of treated effluent to the City of Hollywood for reuse. The Florida Department of Environmental Protection (FDEP) has issued permits allowing the City of Hollywood to irrigate their golf courses, parks, etc. with the treated effluent

received from the Town of Davie. Thus, the Town of Davie has already implemented a partial effluent reuse program. Currently, the Town of Davie contributes up to 80 percent of its effluent to reuse. The remainder of the treated wastewater is disposed of through the Hollywood ocean outfall. In addition, the WWTP reuses approximately 100 GPM of plant effluent water for cleaning of the belt filter press. The reuse water is filtered and is used in the Residuals Building. It should be noted that the Large User Agreement between the Town of Davie and the City of Hollywood would remain in effect for fifty (50) years from the date of initial flow from the Town, which was in 1987. Therefore, the Town of Davie is required to transmit up to 2.3 MGD of treated effluent to the City of Hollywood until the year 2037. This date may be extended to the maturity date of any bond issued or other financial indebtedness incurred by Hollywood for improvements to the Hollywood Facility, and if the proceeds from such bonds or other financial indebtedness incurred are used to improve on existing or provide new service to the Town of Davie. Due to the recently promulgated legislation requiring closure of the ocean outfall, the Town is investigating alternative disposal methods such as aquifer recharge of highly treated effluent and deep injection well disposal.

**6.7 INTERGOVERNMENTAL COORDINATION SECTION 8: GOALS, OBJECTIVES AND POLICIES**

The Town has adopted several goals, objectives and policies into the Future Land Use, Infrastructure, Conservation, Capital Improvement and Intergovernmental Coordination Elements of the Comprehensive Plan that address water supply sources, facilities, and coordination. In preparation of this document, coordinated with a number of governmental agencies so that the findings and conclusions were the result of information exchange and an understanding of the implications associated with this plan. All water suppliers except Ferncrest Utilities (a.k.a. Tindal Hammock Utilities) within the Town have indicated in their WSFWP's that they are pursuing alternative water supplies as well as increased conservation. This will provide adequate water supplies to the Town's residents supplied by these providers. Ferncrest Utilities, based on their current 20 year water use permit, has sufficient water to provide service to its customers. The following table lists the proposed methods for water suppliers within the Town to provide alternative water supplies to its customers.

Table 6.2

Intergovernmental Coordination – Water Providers AWS Projects

PROVIDER	AWS method	AWS method	AWS method
Davie	Conservation (unknown capacity)	Floridan Aquifer – 6 MGD at new WTP (Firm Capacity)	Reuse – 1 MGD (firm Capacity)
Sunrise	Conservation – 0.75 MGD (Firm capacity)	Floridan Aquifer – 6.4 MGD (Firm Capacity)	Reuse – 1.6 MGD (Firm Capacity)
Ft. Lauderdale	Conservation – Expect 10% reduction (Firm capacity)	Floridan Aquifer – 6 MGD at Peele Dixie Plant (Firm capacity)	Reuse – Various Projects (unknown capacity)
Hollywood	Conservation – 0.85 MGD (by 2027)	Floridan Aquifer – 6 MGD (Firm capacity)	Reuse – 1.11 MGD (additional Reuse customers and modification of existing system)
Broward County	Purchases water from Hollywood for resale to District 3A customers	See Hollywood AWS projects	
Ferncrest	None needed – 20 year permit issued		

**Firm capacity** is AWS projects installed during the 10 year planning horizon

**6.8 CAPITAL IMPROVEMENT ELEMENT**

The Town of Davie has developed the cost estimates for implementation of the 10 year Water Supply Facilities Work Plan and compared the impact of those costs to its financial position. The Town recently completed a utility rate study and as a result of that study recently implemented rate and impact type fee increases. The Town of Davie shall work on implementing cash reserves sufficient to cover the proposed water supply projects, and is also actively seeking alternative financing methods such as SRF loans and a tax free municipal bond issuance as the project is being implemented in stages.

**6.9 CONCLUSIONS SECTION 9: CONCLUSION**

In 2007 the South Florida Water Management District adopted a regional water availability rule that limited water resources within the Lower East Coast region. As a result, the Town of Davie has determined that the Biscayne Aquifer water source that had been planned as

~~the source for all the Town's future water needs can no longer be used to meet those future demands. The City has evaluated the impact of since implemented ation of new alternative water sources to meet this shortfall in its future planned needs and . As part of this evaluation population growth projections and water demands were matched to the Lower East Coast Water Supply Plan and to Broward County's population plans, as well as additional demands by the RAC and TOC re-development areas. A water supply work plan was then formulated that matched alternative source water development with water demand projections as outlined in the Town's water supply facilities work plan. growth. The results is a plan that the Town can fund from cash reserves as well as use alternative funding sources if desired for the next five to ten years. The plan is designed to minimize the Town's risk by providing significant flexibility with the timing of new facilities, thus minimizing capital outlay until it is actually needed. The Town has already constructed a new 6MGD reverse osmosis water treatment plant with an ultimate capacity of 12 MGD.~~

The Town will continue to implement actions including working closely with regulatory agencies, local governments, other utility service providers, and stakeholders in order to develop both short and long term strategies related to improved water supply and resource availability, and reduced demands.

**APPENDIX A**

AN ORDINANCE OF THE TOWN OF DAVIE, FLORIDA, PROVIDING FOR INCREASES IN THE RATES, FEES AND CHARGES FOR WATER AND SEWER SERVICES TO BE FURNISHED BY THE TOWN; PROVIDING FOR THE ESTABLISHMENT OF SUCH RATES, FEES AND CHARGES; PROVIDING FOR CONFLICTS, PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the Town conducted a water and wastewater rate study completed by Public Resources Management Group; and

WHEREAS, the Town has determined that rates for water and wastewater services must be increased to continue to pay for the cost of operations, fund the Utilities Capital Improvement program, and meet the rate covenants per the bond resolution; and

WHEREAS, the Town will not be able to provide adequate water and sewer services to all of the citizens within its service area without such rate increases;

NOW, THEREFORE, BE IT ORDAINED BY THE TOWN COUNCIL OF THE TOWN OF DAVIE, FLORIDA.

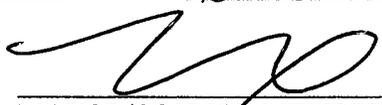
SECTION 1. That the Town of Davie does hereby adopt the "Town of Davie Utilities Department Water and Sewer Service Rates" as provided for in Exhibit "A" attached hereto and incorporated herein.

SECTION 2. This Ordinance and Exhibit attached hereto shall supersede all prior Ordinances and Resolutions of the Town of Davie pertaining to water and sewer utilities to the extent of any conflict herein.

SECTION 3. This Ordinance shall take effect immediately upon its passage and adoption.

PASSED ON FIRST READING THIS 5<sup>th</sup> DAY OF December, 2007.

PASSED ON SECOND READING THIS 19<sup>th</sup> DAY OF December, 2007.

  
MAYOR/COUNCILMEMBER

Attest  
  
TOWN CLERK

APPROVED THIS 19<sup>th</sup> DAY OF December, 2007

**EXHIBIT "A"**  
**TOWN OF DAVIE UTILITIES DEPARTMENT**  
**WATER AND SEWER SERVICE RATES**

**1. PROJECTED REVENUE ADJUSTMENTS**

	<b>FY2008</b>	<b>FY2009</b>	<b>FY2010</b>	<b>FY2011</b>	<b>FY2012</b>
A. Water	50%	20%	9%	9%	9%
B. Wastewater	65%	20%	16%	16%	16%

**2. MONTHLY RATES – WATER**

**A. RESIDENTIAL BASE RATE**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012</b>
Single Family Home	\$12.20	\$14.64	\$15.96	\$17.40	\$18.97
Multi-Unit Residential including duplexes, townhomes, etc. (per dwelling unit)	\$9.76	\$11.71	\$12.76	\$13.91	\$15.16
Mobile Home Units (per dwelling unit)	\$7.32	\$8.78	\$9.57	\$10.43	\$11.37

**B. NON-RESIDENTIAL/COMMERCIAL/INSTITUTIONAL CLASS  
BASE RATE BY METER SIZE**

3/4" or less	\$12.20	\$14.64	\$15.96	\$17.40	\$18.97
1"	30.50	36.60	39.89	43.48	47.39
1-1/2"	61.00	73.20	79.79	86.97	94.80
2"	97.60	117.12	127.66	139.15	151.67
3"	183.00	219.60	239.36	260.90	284.38
4"	305.00	366.00	398.94	434.84	473.98
6"	610.00	732.00	797.28	869.69	947.96
8"	976.00	1171.20	1276.61	1391.50	1516.74

**C. IRRIGATION CLASS BASE RATE**

Per ERC	\$12.20	\$14.64	\$15.96	\$17.40	\$18.97
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### **3. MONTHLY RATES - WASTEWATER:**

#### **A. RESIDENTIAL BASE RATE**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>	<b>FY 2012</b>
Single Family Home	\$18.13	\$21.76	\$25.24	\$29.27	\$33.96
Multi-Unit Residential including duplexes, townhomes, etc. (per dwelling unit)	\$14.50	\$17.40	\$20.19	\$23.42	\$27.17
Mobile Home Units (per dwelling unit)	\$10.88	\$13.05	\$15.14	\$17.56	\$20.38

#### **B. NON-RESIDENTIAL/COMMERCIAL/INSTITUTIONAL CLASS BASE RATE BY METER SIZE**

3/4" or less	\$18.13	\$21.76	\$25.24	\$29.27	\$33.96
1"	45.33	54.39	63.09	73.19	84.90
1-1/2"	90.65	108.78	126.18	146.37	169.79
2"	145.04	174.05	201.90	234.20	271.67
3"	271.95	326.34	378.55	439.12	509.38
4"	453.25	543.90	630.92	731.87	848.97
6"	906.50	1087.80	1261.85	1463.74	1697.94
8"	1450.40	1740.48	2018.96	2341.99	2716.71

### **4. VOLUME CHARGE**

#### **A. Volume charge per 1,000 gallons for water (Single family, Multi-Unit, Mobile Home and Irrigation Classes)**

	<b>FY2008</b>	<b>FY2009</b>	<b>FY2010</b>	<b>FY2011</b>	<b>FY2012</b>
Block 1	\$2.01	\$2.41	\$2.63	\$2.87	\$3.13
Block 2	3.01	3.61	3.93	4.28	4.67
Block 3	4.02	4.82	5.25	5.72	6.23
Block 4	5.02	6.02	6.56	7.15	7.79
Block 5	6.03	7.24	7.89	8.60	9.37
Block 6	7.03	8.44	9.20	10.03	10.93

#### **B. Volume charge per 1,000 gallons of water (Non-residential, Commercial and Institutional Classes)**

All Usage	\$2.59	\$3.11	\$3.39	\$3.70	\$4.03
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#### **C. Volume charge per 1,000 gallons of sewer (All Retail Classes)**

All Usage	\$3.27	\$3.92	\$4.55	\$5.28	\$6.12
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Wastewater billing cap for single family accounts – 15,000 gallons per account  
Wastewater billing cap for multi-unit accounts – 12,000 gallons per unit  
Wastewater billing cap for mobile home accounts – 9,000 gallons per unit

D. Price blocks by customer class (Consumption block up to or next)

	<b>Block 1</b>	<b>Block 2</b>	<b>Block 3</b>	<b>Block 4</b>	<b>Block 5</b>	<b>Block 6</b>
Single family	5,000	10,000	20,000	30,000	50,000	Over 50,000
Multi-Unit	4,000	8,000	16,000	24,000	40,000	Over 40,000
Mobile Home	3,000	6,000	12,000	18,000	30,000	Over 30,000
Irrigation	5,000	10,000	20,000	30,000	50,000	Over 50,000

**5. PRICE INDEX ADJUSTMENT**

The Town shall adopt annually, effective with bills rendered on and after October 1, 2012, and each year thereafter, an automatic increase to the monthly base rates and volume charges for the water and wastewater systems, respectively, to recover the effects of inflationary increases in the cost of providing service. The annual index adjustment shall be calculated by applying one hundred percent (100%) of the percentage change in the consumer price index reported by the Bureau of Labor Statistics (all urban consumers – Miami/Fort Lauderdale) as of April of each year or 3.5%, whichever is less, to the monthly base rates and volume charges. All other adjustments in excess of those identified above will be changed by an Ordinance as adopted by the Town Council.

**6. ACCOUNT DEPOSIT**

A. Residential – Owner occupied (Single family, multi-unit, mobile home)

Water Service	\$ 50.00
Sewer Service	\$ 50.00
Water & Sewer Service	\$100.00

B. Residential – Rental Units (Single family, multi-unit, mobile home)

Water Service	\$ 75.00
Sewer Service	\$ 75.00
Water and Sewer Service	\$150.00

C. Non-Residential, Commercial Institutional

<b>METER SIZE</b>	<b>WATER DEPOSIT</b>	<b>SEWER DEPOSIT</b>	<b>WATER &amp; SEWER DEPOSIT</b>
5/8" or 3/4"	\$ 75.00	\$ 75.00	\$150.00
1"	\$150.00	\$150.00	\$300.00
1-1/2"	\$200.00	\$200.00	\$400.00
2"	\$300.00	\$300.00	\$600.00

D. Irrigation Meters - \$50.00 for each calculated ERC

## 7. MISCELLANEOUS CHARGES

Connect Charge: Between 8:30 am and 5:00 pm \$30.00  
Monday through Friday, to establish  
service at Customer's request

After 5:00 pm or during Weekends or \$100.00  
Holidays, to establish service at  
Customer's request

Disconnect Charge: Between 8:30 am and 5:00 pm \$30.00  
Monday through Friday, for non-payment  
of account or returned checks

After 5:00 pm or during Weekends or \$100.00  
Holidays, for non-payment of account  
or returned checks

Reconnection will be at no additional  
cost once payment is received.

Late Charges: Payment will be considered late if not received  
by 5:00 pm on the DUE DATE indicated on the  
bill. The late charge is \$7.00 or 12% of the bill,  
whichever is the greatest.

Returned Checks: There will be a charge of \$25 for all returned checks. If  
payment for returned check is not made before due  
date on bill, a late charge will be added.

Tampering Charge: There will be a charge of \$300 for tampering with any  
Utility service, plus any and all repair costs incurred.

Removal of Jumper or \$250.00  
Illegal Bypass

Unauthorized Use of \$500.00  
Water from Fire Hydrant:

## 8. CONTRIBUTION CHARGES

The Town of Davie uses Equivalent Residential Connection (ERC) factors for determining fees and charges. By definition, one ERC is a single family residence with a standard 5/8" water meter. The Town of Davie will follow the Broward County Office of Environmental Services (OES) Equivalent Residential Unit Factor Schedule which contains factors for common types of use. The contribution charges will be as follows:

Water (per ERC – 350 GPD)	\$3,050
Sewer (per ERC – 350 GPD)	\$2,920

Collections and expenditures of Contribution Charges shall be accounted for and the revenues derived shall be kept in a separate accounting fund.

An annual audit shall be performed by a certified public accountant and submitted to the Auditor General. This audit shall be accompanied by an affidavit of the Town of Davie Chief Financial Officer which certifies that the Town of Davie has complied with F.S. 163.31801.

**9. CAPITAL FINANCING RECOVERY FEES (CRFR)**

Capital Financing Recovery Fees recapture the financing costs associated with the water and wastewater capacity necessary for new connections. Such fees will be used to pay the principal of and interest on the utility bonds and other utility debt as shall become due. These fees accrue over a six-year period. These charges are to be paid at the time a building permit is issued and are in addition to Contribution Charges.

This Capital Financing Recovery Fee is based upon the water and sewer cost recovery data derived from the 2007 Town of Davie Water and Wastewater Rate Study.

	<b><u>Monthly Accrual</u></b>
Water System	\$11.97
Wastewater System	<u>8.11</u>
Combined System	\$20.08

**10. CAPACITY RESERVATION CHARGES**

VACANT UNITS: Property owners are responsible for payment of Base Water and Sewer Service charge even when units are not occupied.

UNCONSTRUCTED UNITS: Developer is responsible for payment of Base Water and Sewer Service charges for all units not occupied or built within twelve (12) months from the date of the original Water and Sewer Agreement. Charges will be based on the number of unoccupied and/or un-constructed ERCs. Lack of payment will nullify service agreement and capacity reservation.

## Appendix B

RESOLUTION NO. R-2008-111

A RESOLUTION OF THE TOWN OF DAVIE, FLORIDA, INDICATING THE OFFICIAL INTENT OF THE TOWN COUNCIL TO ISSUE TAX-EXEMPT BONDS TO FINANCE THE COST OF IMPROVEMENTS AND ADDITIONS TO THE TOWN'S WATER AND SEWER SYSTEM AND TO USE A PORTION OF THE PROCEEDS OF SUCH BONDS TO REIMBURSE EXPENDITURES PAID OR INCURRED PRIOR TO THE DATE OF ISSUANCE THEREOF.

WHEREAS, the Town Council of the Town of Davie, Florida (the "Town") intends to issue tax-exempt bonds (the "Bonds") for the purpose of expanding and improving the Town's Water and Sewer System, as detailed in Exhibit "A" (the "Project"); and

WHEREAS, a portion of the costs of the Project may be paid before the Bonds are issued in anticipation of the reimbursement of such expenditures from proceeds of the Bonds; and

WHEREAS, Federal income tax regulations require the Town to officially declare its intent to use proceeds of the Bonds to reimburse expenditures paid prior to issuance thereof as a prerequisite to the proceeds being treated as used for reimbursement purposes;

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF DAVIE, FLORIDA:

SECTION 1. The Town Council intends to issue the Bonds in the amount necessary to finance the costs of the Project.

SECTION 2. The maximum principal amount of the Bonds expected to be issued for this Project is One Hundred Twenty Million Dollars (\$120,000,000).

SECTION 3. This Resolution is adopted for purposes of complying with the requirements of the Federal income tax regulations.

SECTION 4. This Resolution shall be made available for public inspection at the main administrative office of the Town or at the customary location of records of the Town that are available to the general public no later than 30 days after the date hereof, and shall remain available on a reasonable basis until the date of issue of the Bonds.

SECTION 5. This resolution shall take effect immediately upon its passage and adoption.

PASSED AND ADOPTED THIS 4<sup>th</sup> DAY OF June, 2008

  
\_\_\_\_\_  
MAYOR/COUNCIL MEMBER

Attest:

  
\_\_\_\_\_  
TOWN CLERK

APPROVED THIS 4<sup>th</sup> DAY OF June, 2008

# Exhibit A

## Water and Wastewater Capital Improvement Program

Project Description	Fiscal Year Ending September 30,					Total
	2008	2009	2010	2011	2012	
Equipment	\$430,000	\$582,476	\$595,290	\$608,386	\$621,771	\$2,837,923
Equipment Replacement	\$607,300	\$544,011	\$555,979	\$568,210	\$580,711	\$2,856,211
Meters and Fittings	\$91,920	\$103,795	\$106,079	\$108,413	\$110,798	\$521,005
Generator Repair/Replacement	\$630,000	\$0	\$0	\$0	\$0	\$630,000
Lime Basin Repair	\$385,000	\$0	\$0	\$0	\$0	\$385,000
Lift Station 8 Rehabilitation and Force Main Replacement	\$2,000,000	\$2,000,000	\$0	\$0	\$0	\$4,000,000
Lift Station 11 Rehabilitation	\$290,000	\$0	\$0	\$0	\$0	\$290,000
Lift Station Telemetry	\$200,000	\$200,000	\$200,000	\$0	\$0	\$600,000
New 6 MGD Water Treatment Plant (4 MGD Phase I)	\$4,503,000	\$15,010,000	\$10,507,000	\$0	\$0	\$30,020,000
New 6 MGD Wastewater Treatment Plant (4 MGD Phase I)	\$0	\$8,413,500	\$28,045,000	\$19,631,500	\$0	\$56,090,000
Wastewater Infrastructure Piping	\$0	\$382,500	\$1,275,000	\$892,500	\$0	\$2,550,000
Water Infrastructure Piping	\$0	\$375,000	\$1,250,000	\$875,000	\$0	\$2,500,000
Replace Old 2" Water Line Replacements	\$0	\$500,000	\$500,000	\$500,000	\$0	\$1,500,000
Close North Water Treatment Plant	\$0	\$0	\$500,000	\$0	\$0	\$500,000
Expansion of Existing Wastewater Treatment Plant From 5 MGD to 7 MGD	\$3,250,000	\$3,250,000	\$0	\$0	\$0	\$6,500,000
Land Acquisition for New Water and Wastewater Treatment Plants	\$8,219,861	\$0	\$0	\$0	\$0	\$8,219,861
<b>Total</b>	<b>\$20,607,081</b>	<b>\$31,361,282</b>	<b>\$43,534,348</b>	<b>\$23,184,009</b>	<b>\$1,313,280</b>	<b>\$120,000,000</b>

**Appendix C**

**Excerpts of Approved City of Hollywood WSWP**

**City of Hollywood**

## **WATER SUPPLY PLAN**

Potable Water Sub-Element



Prepared by  
The Utilities Department and  
Malcolm Pirnie, Inc.

City of Hollywood  
Hollywood, Florida  
October 2008

## 2. Water Service Areas

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*This section introduces the geographic service areas for potable and reuse water service providers of the City of Hollywood jurisdiction. This section also presents the population projections by water service area.*

### 2.1. Potable Water Service Areas

The City of Hollywood, located in southeast Florida, covers approximately 29 square miles bound by the Atlantic Ocean to the east and surrounded by seven cities, one town, a Seminole reservation, and unincorporated areas. Figure 2-1 illustrates the City of Hollywood jurisdiction and its neighboring municipalities. Except for Port Everglades, the City of Hollywood jurisdiction is supplied with finished water produced at the City of Hollywood Water Treatment Plant. Port Everglades is supplied by the City of Fort Lauderdale Public Works Department.

#### 2.1.1. City of Hollywood Potable Water System Service Area

The City of Hollywood Water Treatment Plant (City's WTP) is operated by the City of Hollywood Department of Public Utilities (HLWD-DPU). The City's WTP supplies both a retail service area, extending over most of the City of Hollywood jurisdiction, and a wholesale service area, covering Broward County Water and Wastewater Services (BCWWS) Districts 3A, 3B, and 3C. In this report, these service areas are referred to as HLWD-DPU water retail area and HLWD-DPU water wholesale area. In 2007, the HWLD WTP produced approximately 23 million gallons per day (mgd) of potable water, of which 16.3 mgd were served to nearly 40,000 connections in the retail area and the remaining 6.7 mgd were sold to the wholesale service area. All three BCWWS districts are served under an interlocal resale water agreement by which Broward County purchases potable water from HLWD-DPU for resale to its customers.

Beyond the City of Hollywood jurisdiction, the HLWD-DPU water retail area serves approximately 300 acres in the Town of Davie, 50 acres in the City of Dania, and 100 acres in the Seminole reservation. These areas are billed as retail customers. It should be noted that the Hard Rock Hotel and Casino is served by the Town of Davie.

In addition to the retail and wholesale services, HLWD-DPU has an emergency connection with the City of Dania Beach, which withdraws water from the HLWD-DPU system to maintain its system pressure. In 2007, the City supplied an average of 0.02 mgd on a regular basis to Dania Beach. Dania Beach is currently expanding its water treatment capacity with the addition of a nanofiltration (membrane) treatment system. While Dania Beach upgrades its system over the next three years, Dania Beach anticipates getting 1.0 mgd or more from the City during two to five consecutive weeks twice in a year.

Thereafter, the reliance on the City water by Dania Beach is likely to revert to the typical 0.1 mgd throughout the year.

### **2.1.2. Broward County Water Districts 3A and 3B/3C**

BCWWS District 3A covers approximately eight square miles containing portions of the Cities of Dania Beach, Davie, Fort Lauderdale, Fort Lauderdale-Hollywood International Airport, and unincorporated Broward County. BCWWS District 3A has two wholesale interconnects with HLWD-DPU. Districts 3B and 3C are interconnected and are connected to HLWD-DPU via two wholesale interconnects each. Like District 3A, they are also supplied solely by HLWD-DPU. BCWWS District 3B covers approximately four square miles containing the City of West Park and Pembroke Park. BCWWS District 3C covers approximately two square miles containing portions of the City of Hollywood, Miramar, and Pembroke Pines.

All three BCWWS districts fall mainly outside the City of Hollywood jurisdiction except for the 400 acre southwest corner of the City of Hollywood located south of Hollywood Boulevard and west of State Road 7, which is served by BCWWS District 3C – See Figure 2-1. Small areas in the City of Hollywood jurisdiction are served by BCWWS District 3A.

### **2.1.3. Port Everglades**

Port Everglades purchases potable water from the City of Fort Lauderdale through five metered connections at the following locations:

- 10-inch meter at Southeast 17<sup>th</sup> Street
- 12-inch meter at Southeast 20<sup>th</sup> Street
- 8-inch meter at Southeast 24<sup>th</sup> Street
- 16-inch meter at Southeast Eller Drive / Old South Federal Highway
- 10-inch meter at 900 Southeast 26<sup>th</sup> Street

Port Everglades distributes this potable water to various commercial and industrial users within its boundaries, such as passenger cruise ships, the FPL power generation facility, cargo container ships, and commercial space.

In summary, three water utilities supply the City of Hollywood jurisdiction: (1) HLWD-DPU, (2) BCWWS, and (3) the City of Fort Lauderdale Public Works Department. The first two utilities are supplied by the same water treatment plant (City's WTP) and deliver potable water to the entire jurisdiction except for Port Everglades, which is supplied by the City of Fort Lauderdale Public Works Department. Table 2-1 tabulates the number of square miles covered by each potable water service area in and out of the City of Hollywood jurisdiction. There are no anticipated changes in the size or coverage of these potable water service areas.

## 4. Water Demand Characterization

This section characterizes HLWD-DPU's retail water customers by location, size, and class and describes the existing HLWD wholesale agreement with Broward County. Based on HLWD-DPU's historical finished water production, this section also determines the following water demand parameters – used for forecasting purposes: average per-capita daily demand, maximum-day and maximum-month peaking factors, and fire flow. This section ends with a brief review of Port Everglades' water demand characterization, water demand forecast, and water supplier adequacy.

The City's WTP serves the residents of the City of Hollywood as well as Broward County Districts 3A, 3B, and 3C. The City's WTP also serves small portions of the Town of Davie, the City of Dania Beach, and the Seminole reservation, which are all billed as retail customers. Broward County is billed as a wholesale customer. In 2007, the annual average daily finished water production of the City's WTP was approximately 23 mgd, of which approximately 6.7 mgd was sold to Broward County. The following subsection characterizes the retail customer water consumption and the subsection after describes the existing wholesale agreement.

### 4.1. HLWD-DPU Retail Customers

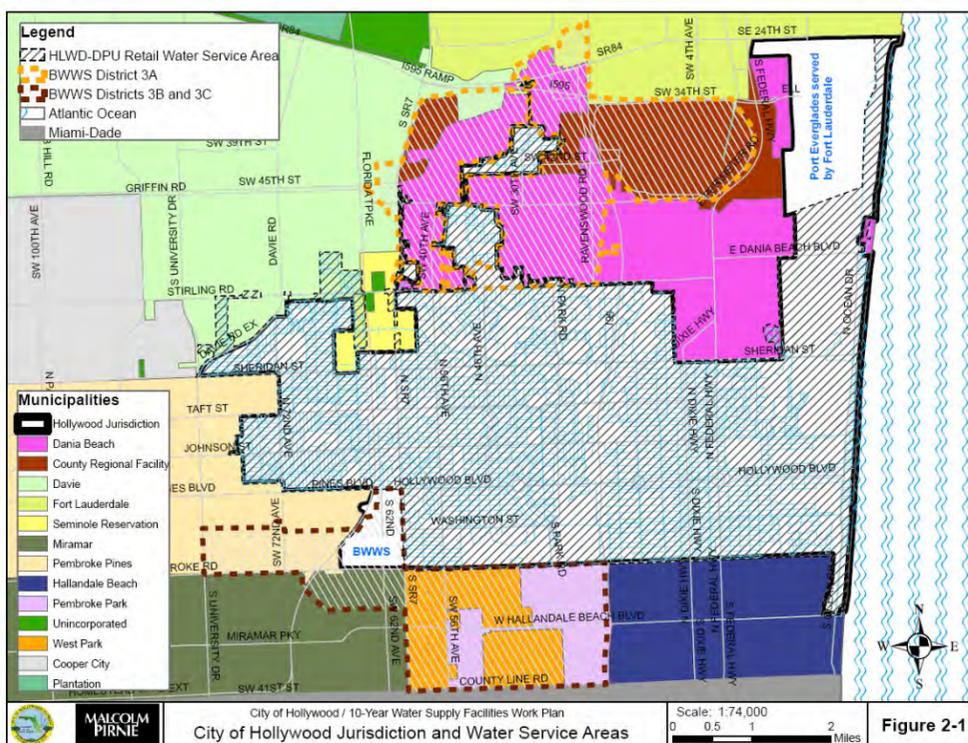
The City's retail service area is supplied entirely by finished water produced at the City's WTP. To characterize the retail water demand throughout the service area, Malcolm Pirnie evaluated the available 2004 monthly billing records of 37,218 customer accounts. Based on 2004 billing records, the retail water demand was characterized by customer location, size, and class as indicated below. It should be noted that this characterization was performed as part of the 2007 Water Master Plan and a brief synopsis is presented herein.

#### 4.1.1. Retail Customer Location

Geocoded customers from 2004 monthly billing records were related to the TAZs covering the retail service area. The corridor along Ocean Drive (A1A) showed the highest metered water consumption per acre in the service area ranging from 1,000 gallons per day per acre (gpd/acre) to 5,000 gpd/acre, followed by downtown Hollywood ranging from 650 gpd/acre to 4,000 gpd/acre. In particular, the latter high-end demand is likely due to downtown workforce density. At the City level, retail customers were further aggregated into the following three metered geographical zones:

1. West of Dixie Highway
2. Dixie and Federal Corridor

City of Hollywood Utilities Element Potable Water – Water Supply Plan WS 4-1



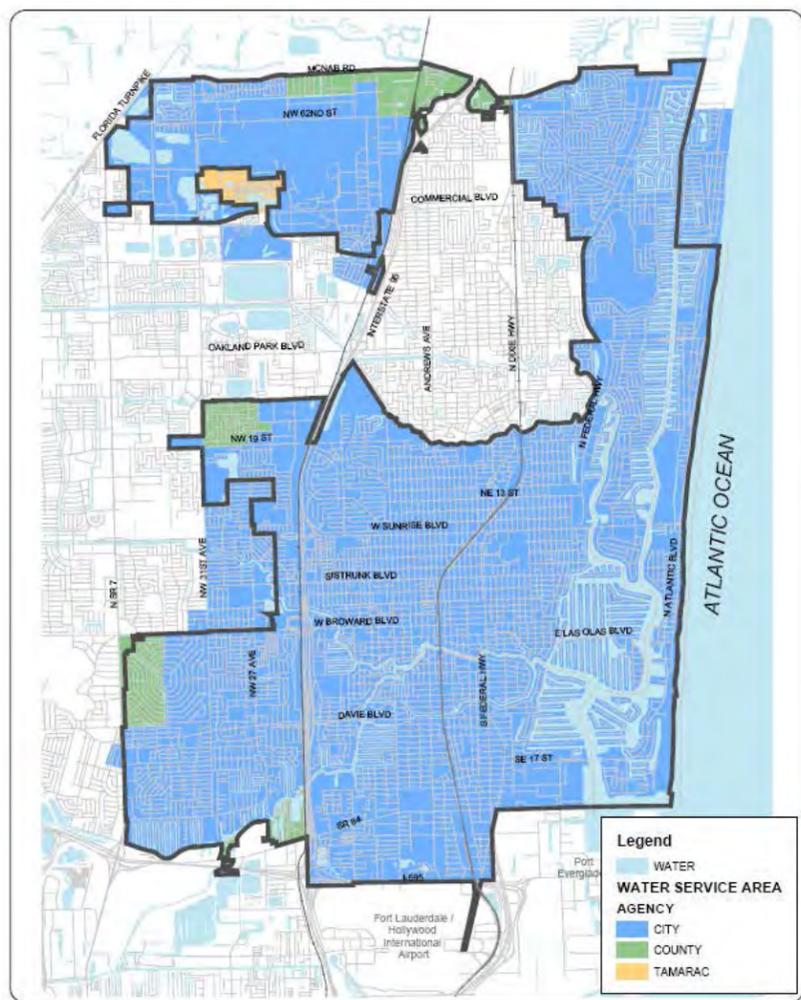
**Excerpts of Approved  
City of Ft. Lauderdale WSWP**

# City of Fort Lauderdale Water Supply Facilities Work Plan

Prepared for the  
Florida Department of Community Affairs

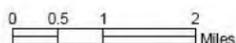
Prepared by the  
City of Fort Lauderdale Public Works Department,  
City of Fort Lauderdale Planning & Zoning Department  
and Hazen and Sawyer Consultants

January 2009  
Ordinance No. C-09-01



WATER SERVICE AREA  
Map 1.1

DATA SOURCE: CITY OF FORT LAUDERDALE PUBLIC SERVICES DIVISION  
MAP SOURCE: CITY OF FORT LAUDERDALE PLANNING & ZONING DEPARTMENT - JULY, 2006



**Section 2.2 Permanent Residents in Cities That Purchase Wholesale Water from the City of Fort Lauderdale**

Four cities purchase water from the City of Fort Lauderdale: Oakland Park, Tamarac, Wilton Manors and Davie. The projected populations used for these entities, and Oakland Forest, a subdivision that obtains water from Fort Lauderdale through a master meter, are provided in Table 2.2. The percent changes in projected populations were used to forecast wholesale water demands from these customers. The baseline figures and projections were developed in consultation with the City's wholesale customers and are consistent with figures in their water supply plans.

The City of Fort Lauderdale's Public Works Department monitors water use of wholesale customers through user agreements, monthly meetings and monthly monitoring reports. The user agreements include several measures to ensure that water use remains consistent with projections in the water supply plans. For example, any new utility customer requesting more than 100,000 gallons of water per day must receive written approval from the City of Fort Lauderdale. The user agreements also require the purchasing cities to comply with City of Fort Lauderdale conservation regulations.

**Table 2.2  
Permanent Populations, Current and Projected  
Cities of Oakland Park, Tamarac, Davie and Wilton Manors(a)  
Wholesale Customer**

	2000	2005	2010	2015	2020	2025
Oakland Park	25,856	26,492	26,618	29,467	32,432	35,216
Oakland Forest(b)	3,219	3,371	3,716	4,042	4,288	4,496
Tamarac(c)	6,359	7,069	7,490	8,060	8,513	8,712
Wilton Manors	12,117	12,390	13,152	14,134	15,030	15,832
Town of Davie – Hacienda Village	2,400	2,400	2,400	2,400	2,400	2,400

(a) Populations in 2000 and 2005 are actual values. Forecasts are provided for all other years.  
 (b) Oakland Forest is a subdivision of the City of Oakland Park and comprises all of TAZ 414. Potable water from the City of Fort Lauderdale is supplied to this subdivision through a master meter. Water demand by the residents in this subdivision was forecast separately from the water demand of the City of Oakland Park.  
 (c) The area of Tamarac served by the City of Fort Lauderdale via a master meter includes small portions of TAZ's 398, 393, 394, and 400. These TAZ's also include areas served by Fort Lauderdale retail service and Oakland Park retail service. The population presented for Tamarac includes the total population in these TAZ's from which the percent growth in population was used to forecast future water demand by the City of Tamarac.  
 (d) Hacienda Village is built out.

**Section 3.6 Wholesale Customer Water Use Forecasts**

The City of Fort Lauderdale also provides wholesale water service to large users adjacent to the service area. These types of accounts are called master meters. One customer account is one master meter that records the amount of water that passes through the Fort Lauderdale water system and into the water system of the wholesale customer. There can be more than one account (or master meter) per wholesale customer.

The monthly 2005 water use and customer account information of each meter associated with each wholesale customer was provided by the City of Fort Lauderdale. The sum of the annual 2005 master meter water use for each wholesale customer is provided in Table 3.6. Also presented in this table are the amounts of water used in 1998 by these customers and other wholesale customers that existed in 1998. The year 1998 was the base year used in the 2000 Fort Lauderdale Water and Wastewater Master Plan.

**Table 3.6  
Water Use by Wholesale Water Customers<sup>(a)</sup>  
Annual Average MGD, Average Rainfall Conditions**

<b>Wholesale User</b>	<b>1998</b>	<b>2005</b>	<b>Percent Change from 1998</b>
City of Oakland Park	3.99	3.91	0.5%
City of Wilton Manors	1.56	1.60	2.5%
Port Everglades	1.79	1.31	-26.6%
Oakland Forest	0.17	0.50	192.2%
City of Tamarac	0.16	0.19	16.7%
Town of Davie – Hacienda Village	0.04	0.10	150%
Broward County Office of Environmental Services	0.42	0.0007	-99.8%
FDOT – Toll Booth (<0.01 MGD)	0.0004	0.0005	16.4%
Broadview Park Water Company	0.75	Account closed	
City of Dania	0.1	Account closed	
<b>Total</b>	<b>8.98</b>	<b>7.61</b>	<b>-15.3%</b>

<sup>(a)</sup> Does not include water distribution system loss.

The method used to forecast water use of each wholesale customer varied depending on the type of customer and the purpose of the water use.

For the City of Oakland Park, City of Tamarac, City of Wilton Manor and Oakland Forest subdivision, the 2005 water use was increased by the projected percent increase in population associated with the geographic areas served by the water supply. Due to the builtout nature of the area, the Town of Davie's Hacienda Village, population and water use was kept at their 2005 levels.

**Table 3.6a**  
**Wholesale Water Use Category Water Use Forecasts<sup>(a)</sup>**  
**Average Rainfall Conditions, Annual Average MGD**

<b>Wholesale User</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>
City of Oakland Park	3.91	4.19	4.63	5.09	5.52
City of Wilton Manors	1.60	1.70	1.82	1.94	2.04
Port Everglades	1.31	1.68	2.14	2.73	3.49
Oakland Forest	0.50	0.55	0.60	0.63	0.66
City of Tamarac	0.19	0.20	0.21	0.22	0.23
Town of Davie – Facienda Village	0.10	0.10	0.10	0.10	0.10
Broward County WW Services	0.0007	0.0012	0.0019	0.0031	0.0049
FDOT – Toll Booth (<0.01 MGD)	0.0005	0.0005	0.0005	0.0005	0.0005
<b>Total</b>	<b>7.61</b>	<b>8.41</b>	<b>9.50</b>	<b>10.72</b>	<b>12.04</b>

<sup>(a)</sup> Does not include distribution system losses.

**Excerpts of Approved**  
**City of Sunrise WSWP**

City of Sunrise



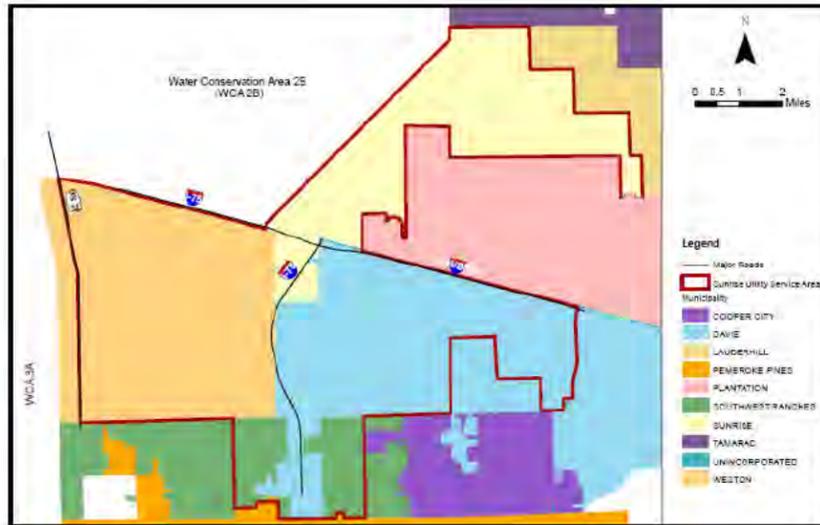
## 10 - Year Water Supply Facilities Work Plan

August 27, 2008

## Section 2 – Water Service Area

Davie, Cooper City and Pembroke Pines service areas to the south. The western boundary of the service area adjoins the South Florida Water Management District (SFWMD) Water Conservation Areas 2B and 3A. The extent of the utility service area is shown in Figure 2-2.

**Figure 2-2**  
**City of Sunrise Utilities Existing Service Area**



### 2.2 SERVICE WITHIN OTHER LOCAL GOVERNMENT JURISDICTIONS

The City of Sunrise regional utility currently is the sole service provider within the Cities of Weston and Sunrise. It also serves approximately 40 percent of the area encompassed by the Town of Southwest Ranches, roughly 60 percent of the area of Town of Davie and smaller areas of Unincorporated Broward County. These are six individual homes located within unincorporated Broward County, they are listed in Appendix I.

Currently, a portion of the Southwest Ranches area uses private wells and septic systems. This area could potentially become part of the City's future retail service area. Figure 2-3 shows the potential Future Service Area.

## Section 3

# Existing Water Supply, Treatment, Storage and Transmission, and Distribution Facilities

---

### 3.0 INTRODUCTION

The City of Sunrise water supply system includes four active wellfields, three water treatment plant sites, two active remote storage and re-pump facilities, and one Aquifer Storage and Recovery (ASR) facility. The Utility's water transmission and distribution system includes approximately 750 miles of water mains ranging in size from 48 to 2 inches in diameter. The City currently has emergency interconnections with the City of Lauderdale, the Town of Davie, the City of Plantation, the City of Pembroke Pines and the City of Cooper City. This section will provide an overview of the City's water supply system, water treatment facilities, and transmission and distribution system.

### 3.1 WATER SUPPLY FACILITIES

The City of Sunrise Utilities water supply system withdraws from the Biscayne Aquifer and has a total capacity of 63 mgd. The City owns the following six wellfields: Springtree, Sawgrass (Arena), Flamingo Park, Melaleuca, Park City and Southwest. The Springtree, Sawgrass (Arena) and Southwest wellfields are active wellfields. Park City and Melaleuca wellfields are out of service. The newly constructed Flamingo Park wellfield is scheduled to be fully operational in 2008. Wellfield locations are shown in **Figure 3-1**. The Sawgrass and Springtree facilities and wellfields each supply about 48 percent of the entire system demand, while the remaining 4 percent is provided by the Southwest Facility. **Table 3-1** presents the capacity of the wellfields that supply each facility.

**Section 4 – Population Projections**

**Table 4-2  
City of Sunrise Service Area Population Projections**

YEAR	2008	2013	2015	2018	2030	Service Area
Weston	63,200	65,500	66,100	66,900	68,500	Existing
Davie	55,700	59,400	60,800	62,500	65,200	Existing
Sunrise	92,800	101,800	106,000	110,400	119,000	Existing
SW Ranches	4,900	5,500	5,700	6,000	6,300	Existing
SW Ranches	5,300	5,600	5,700	5,900	6,000	Future*
<b>Total**</b>	<b>221,900</b>	<b>237,800</b>	<b>244,300</b>	<b>251,700</b>	<b>265,000</b>	

\* The Potential Future Service Area in SW Ranches is derived from Broward County TAZ (Sep 07) population projections.  
 \*\*These population numbers are rounded to the nearest hundred for individual local governments, thus there is a variance to the populations to the degree of 100 between Table 4-2 and Appendix D.

**4.4 POPULATION PROJECTIONS VERIFICATION**

Population projections computed for this work plan were shared and agreed upon with these local governments in the City of Sunrise Utilities service area as part of the intergovernmental coordination element of this work plan. The meeting minutes for these meetings are found in **Appendix E**.

Population projections developed within this work plan were verified with the projections used in the Consumptive Use Permit (CUP) as well as with the projections performed by SFWMD for the Lower East Coast Water Supply Plan (LECWSP).

The results of the population projections published in the LEC for the City of Sunrise regional utility is shown in **Table 4-3**.

**Table 4-3  
LEC WSP Population Projections for Sunrise Utilities**

2010	2015	2020	2025
243,500	252,000	257,400	260,600

Population estimates included in the LECWSP used the BCTAZ 2004 population forecast as a basis for population projections, while the population projections presented are based on the published County projections as of September 2007. The population projection variation between this work plan and LECWSP is less than 5%.

**Section 5 - Water Demands**

**Table 5-4  
Average Annual Day Demand Projections for Local Governments**

YEAR	2008	2013	2015	2018	2030	Service Area
Weston	10,916,000	11,301,600	11,418,000	11,553,300	11,915,300	Existing
Davie	6,174,300	6,543,400	6,682,600	6,839,200	7,169,300	Existing
Sunrise	10,418,000	11,652,600	12,200,800	12,812,600	13,799,400	Existing
SW Ranches	328,500	352,200	362,600	378,300	397,100	Existing
SW Ranches	664,700	701,200	719,800	740,000	764,300	Potential Future Area*
<b>Total**</b>	<b>28,173,000</b>	<b>30,198,800</b>	<b>31,021,200</b>	<b>31,945,100</b>	<b>33,648,300</b>	

\* The Potential Future Service Area in SW Ranches is derived from Broward County TAZ (Sep 07) population projections. The demand projections are computed using the system wide per capita demand of 127 gpcd for potential future area.

\*\*These demand numbers are rounded to the nearest hundred for individual local governments, thus there is a variance to the demands in the order of a hundred between Table 5-4 and Appendix F.

In addition to the demand projections shown in Table 5-4, the net increase in demands by current DRI applicants is approximately 0.4 mgd.

**Excerpts of Approved  
Broward County WSWP**

**Broward County**  
**Table 32 Population and Flow Projections for BCWWS Service Area in a City**

City	Year 2000		Year 2005		Year 2010		Year 2015		Year 2020		Year 2025		Year 2030	
	Population	Flow												
Regional County Facility	0	1.12	0	1.47	0	1.54	0	1.76	0	1.95	0	2.18	0	2.44
Dania Beach	10515	1.73	12145	1.97	13136	2.10	14188	2.28	15182	2.41	15876	2.50	16524	2.60
Davie	376	0.10	648	0.14	686	0.14	722	0.15	756	0.16	788	0.16	814	0.17
Deerfield Beach	21196	2.93	22443	3.10	23848	3.17	24900	3.30	25965	3.44	27145	3.58	28202	3.69
Fort Lauderdale	6909	1.79	7401	1.90	8031	1.99	9463	2.24	10770	2.43	11726	2.59	12462	2.71
Hollywood	5266	0.60	5461	0.63	5750	0.66	6237	0.72	6834	0.77	7749	0.85	8441	0.90
Indian Reservation	86	0.01	94	0.01	110	0.01	133	0.02	151	0.02	157	0.02	164	0.02
Lauderdale Lakes	28514	3.56	29143	3.63	33543	4.02	38814	4.49	43214	4.88	45736	5.15	47529	5.36
Lauderhill	6285	0.75	6469	0.77	6947	0.81	7279	0.85	7772	0.90	8327	0.96	8698	1.00
Lighthouse Point	9745	2.82	10053	2.84	10441	2.87	10740	2.95	11059	3.05	11398	3.15	11680	3.23
Miramar	5423	0.50	5530	0.51	5811	0.53	6160	0.56	6624	0.60	7354	0.66	7932	0.71
North Lauderdale	6199	0.61	6515	0.63	6972	0.66	7347	0.70	7694	0.73	8256	0.78	8752	0.82
Oakland Park	8589	1.30	8801	1.34	12232	1.78	12701	1.86	13196	1.92	13846	2.01	14411	2.08
Pembroke Park	5989	1.45	6598	1.41	6938	1.47	7238	1.59	7543	1.66	7864	1.74	8147	1.80
Pembroke Pines	2696	0.23	2739	0.23	2800	0.23	2915	0.24	3034	0.25	3172	0.26	3256	0.27
Plantation	1131	0.13	1417	0.17	1492	0.18	1647	0.19	1838	0.21	1951	0.22	2011	0.23
Pompano Beach	23772	4.06	24448	4.18	25838	4.25	27563	4.56	29443	4.85	31959	5.18	34153	5.46
Tamarac	1650	0.22	1677	0.23	1770	0.24	1883	0.25	1997	0.27	2164	0.28	2314	0.30
West Park	12848	1.21	13428	1.25	14257	1.32	15426	1.42	16799	1.52	18562	1.65	19971	1.75
Unincorporated	3135	0.36	9437	1.23	10009	1.27	10375	1.31	10995	1.35	11838	1.44	12443	1.50

Note: Based on year 2007 city boundaries. Flow is finished water average day demand potential.

Source: Broward County & SFWMD

**Ferncrest WUP Permit Application**

**Staff Recommendations**

**Date Of Issuance:** November 9, 2006  
**Expiration Date:** November 9, 2026  
**Water Use Classification:** Public Water Supply  
**Sources:** Ground Water from: Biscayne Aquifer

**Recommended Allocation:**  
**Annual Allocation:** 271 Million Gallons (MG)  
**Maximum Monthly Allocation:** 25.1 Million Gallons (MG)

**Existing Withdrawal Facilities - Ground Water**

Source: Biscayne Aquifer  
 1 - 6" X 89' X 0 GPM Well Cased to 89 Feet  
 1 - 8" X 89' X 700 GPM Well Cased to 89 Feet  
 1 - 4" X 87' X 0 GPM Well Cased to 87 Feet  
 1 - 6" X 90' X 700 GPM Well Cased to 90 Feet

<u>Rated Capacity</u>	<u>Status Code</u>	<u>GPM</u>	<u>MGM</u>	<u>MGY</u>
Source Biscayne Aquifer	C	1,400	61.3	736
<b>Totals:</b>		<b>1,400</b>	<b>61.3</b>	<b>736</b>



**Public Water Supply Demands**

Application Number: 041130-11

Service Area: FERNCREST UTILITIES  
 Treatment Name:  
 Standard PCUR: 145  
 Standard Max Monthly Ratio: 1.11  
 System Efficiency:  
 Standard Max Day Ratio:

**Past Water Use (Table-F)**

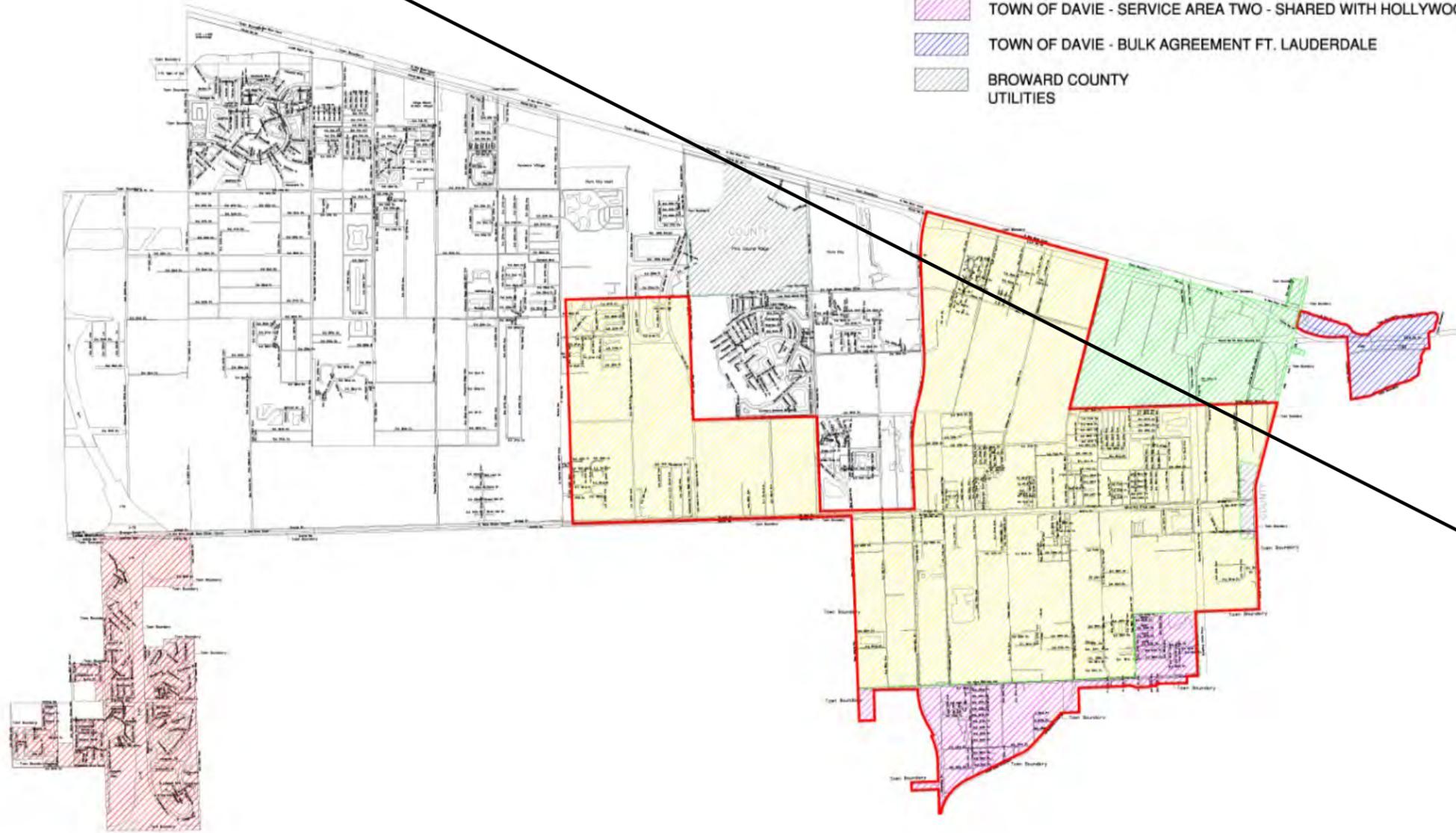
Year	Population	PCUR	Average Use (MGD)	Max Day Use (MGD)	Ratio	Average Monthly Use(MG)	Max Monthly Use (MG)	Ratio	Basis For Demand	Basis For Allocation
2000	4,698	140	0.66			19.94	23.77	1.19		
2001	4,688	149	0.70			21.22	23.80	1.12	Y	Y
2002	4,682	143	0.67			20.33	24.81	1.22	Y	Y
2003	4,678	150	0.70			21.40	22.87	1.07	Y	Y
2004	5,225	146	0.76			23.21	26.23	1.13	Y	Y
2005	5,372	138	0.74			22.46	25.37	1.13	Y	Y

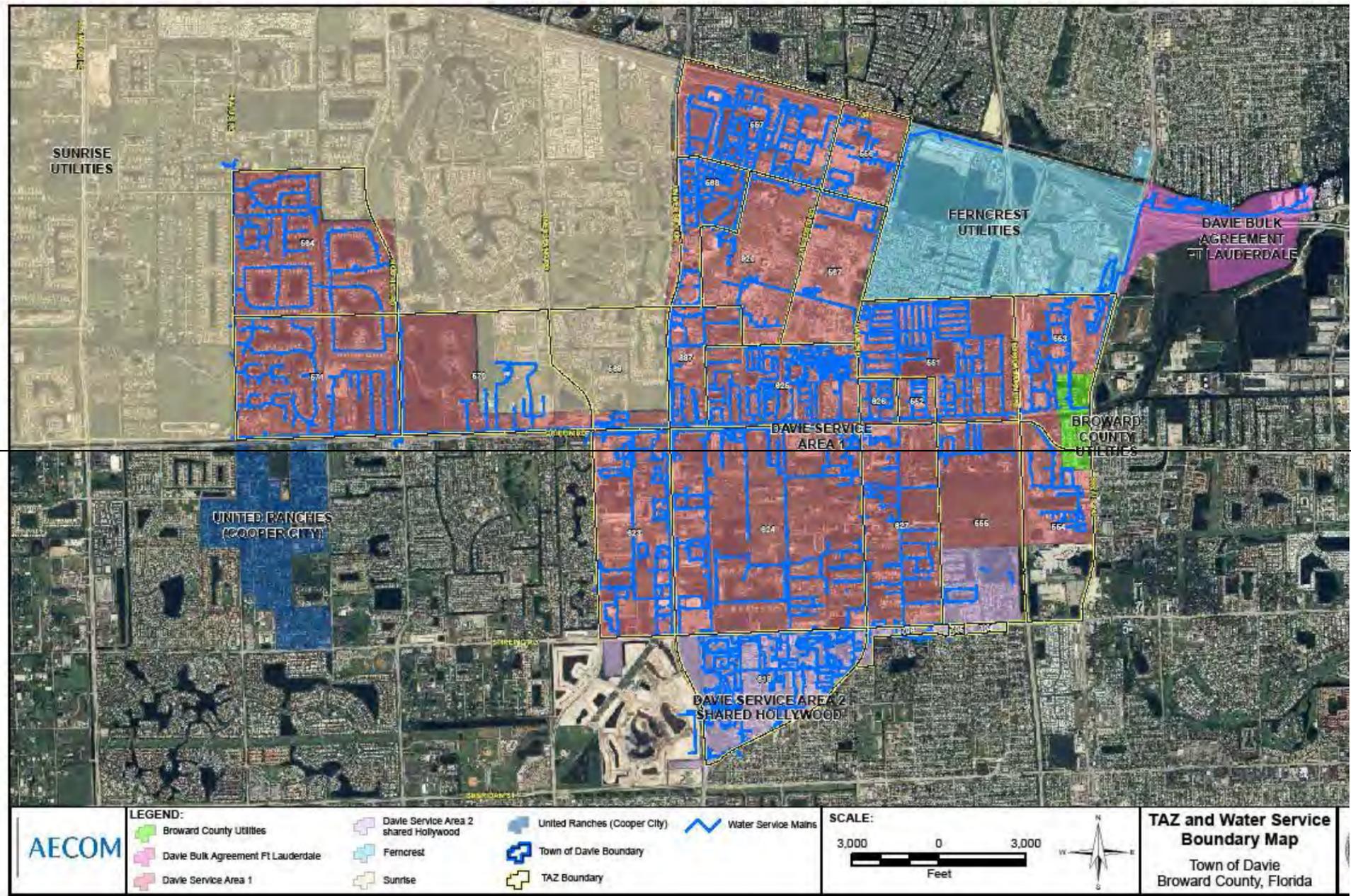
**Projected Water Use (Table-G)**

Year	Population	PCUR	Recommended Average (MGD)	Recommended Max Day (MGD)	Ratio	Average Monthly Use(MG)	Rec Max Monthly (MG)	Ratio	Basis for Allocation
2006	5,435	145	0.79			23.96	26.5928	1.11	
2007	5,615	145	0.81			24.75	27.4735	1.11	
2008	5,845	145	0.85			25.76	28.5989	1.11	
2009	6,125	145	0.89			27.00	29.9689	1.11	
2010	6,304	145	0.91			27.79	30.8447	1.11	
2011	6,304	145	0.91			27.79	30.8447	1.11	
2012	6,304	145	0.91			27.79	30.8447	1.11	
2013	6,304	145	0.91			27.79	30.8447	1.11	
2014	6,304	145	0.91			27.79	30.8447	1.11	
2015	6,304	145	0.91			27.79	30.8447	1.11	
2016	6,304	145	0.91			27.79	30.8447	1.11	
2017	6,304	145	0.91			27.79	30.8447	1.11	
2018	6,304	145	0.91			27.79	30.8447	1.11	

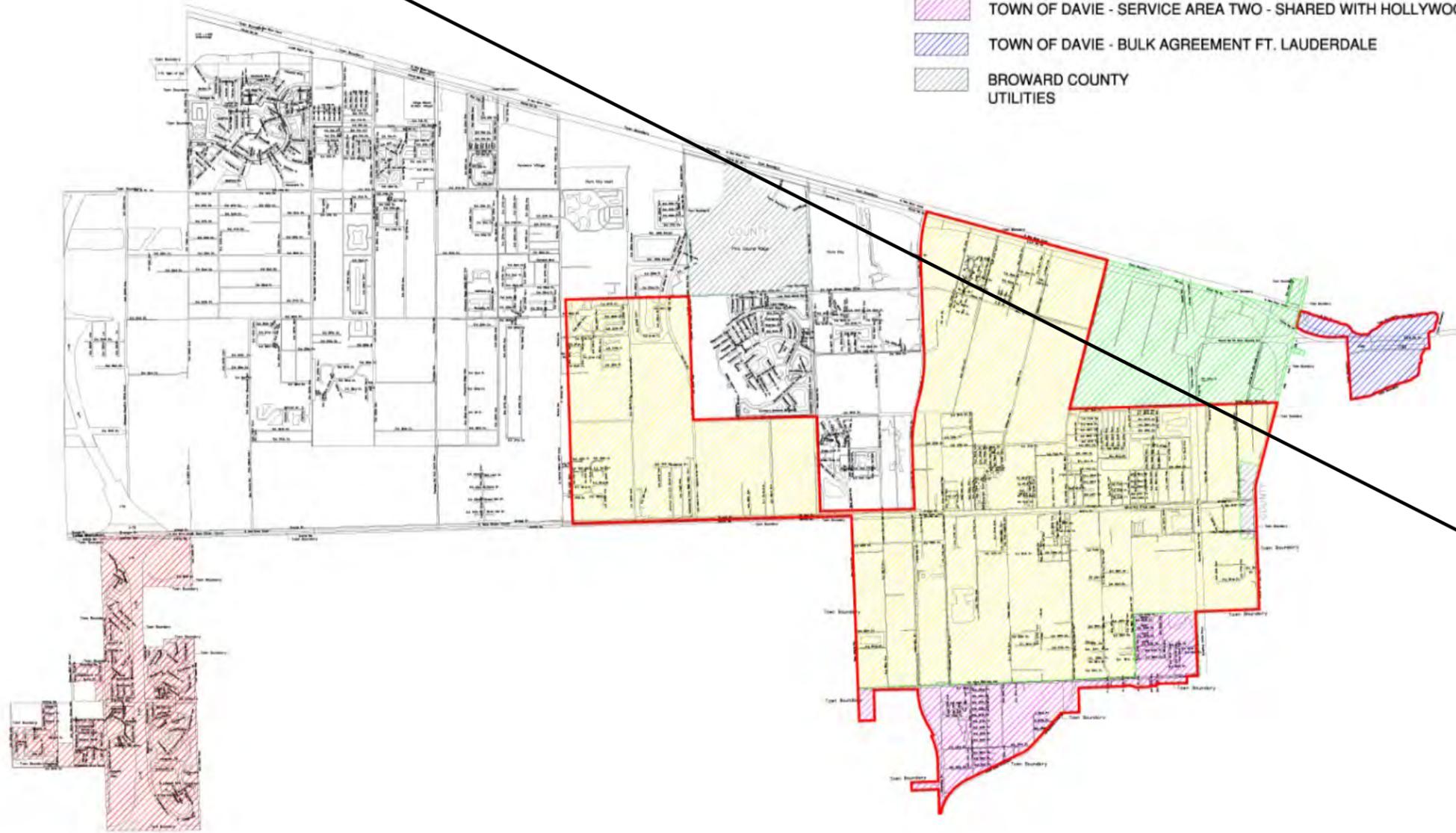
Exhibit No:8

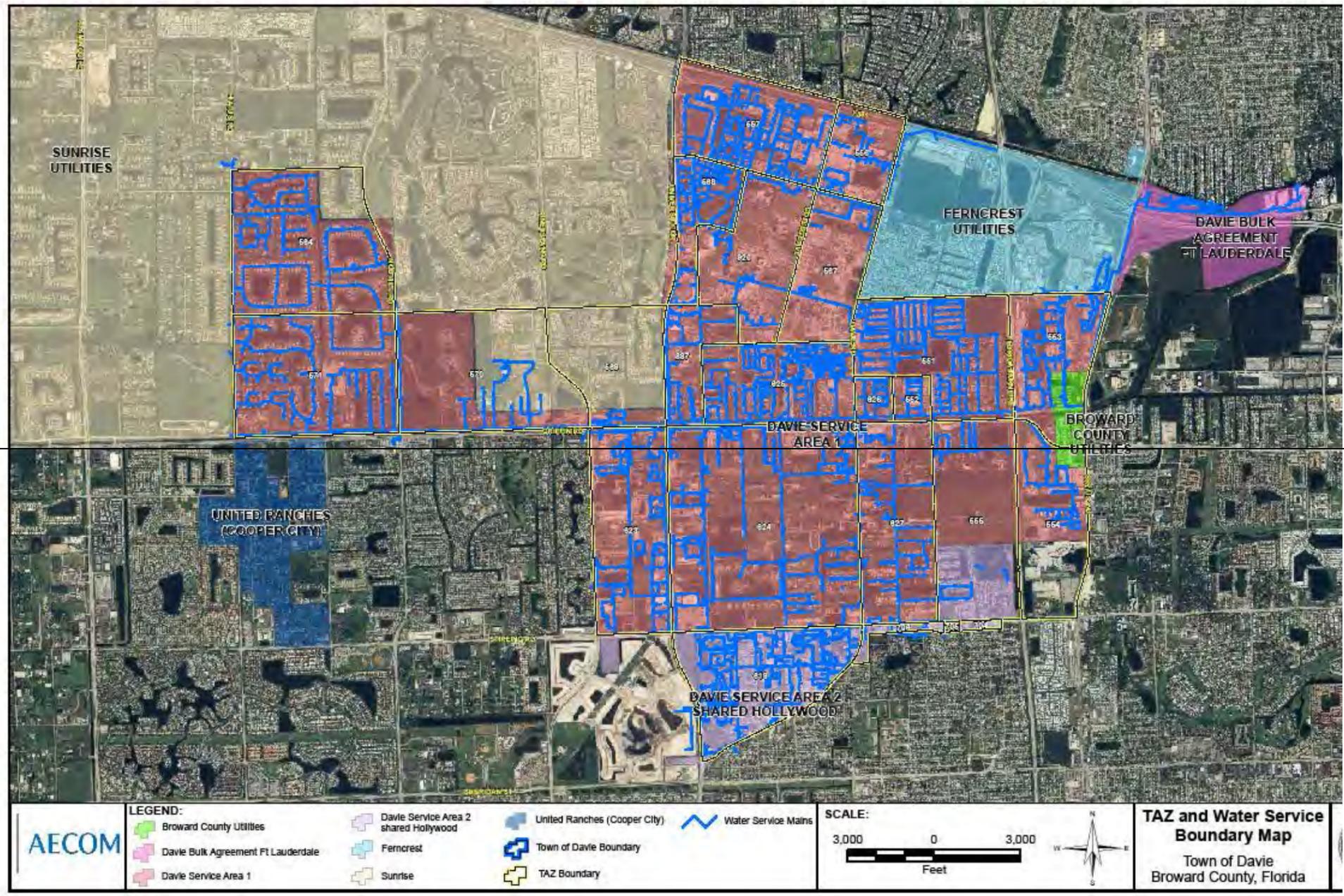
-  CITY OF SUNRISE UTILITIES
-  FERNCREST UTILITIES
-  SOUTH BROWARD UTILITIES
-  TOWN OF DAVIE - SERVICE AREA ONE
-  TOWN OF DAVIE - SERVICE AREA TWO - SHARED WITH HOLLYWOOD
-  TOWN OF DAVIE - BULK AGREEMENT FT. LAUDERDALE
-  BROWARD COUNTY UTILITIES





-  CITY OF SUNRISE UTILITIES
-  FERNCREST UTILITIES
-  SOUTH BROWARD UTILITIES
-  TOWN OF DAVIE - SERVICE AREA ONE
-  TOWN OF DAVIE - SERVICE AREA TWO - SHARED WITH HOLLYWOOD
-  TOWN OF DAVIE - BULK AGREEMENT FT. LAUDERDALE
-  BROWARD COUNTY UTILITIES





# EXHIBIT "B"

## WATER SUPPLY FACILITIES WORK PLAN AMENDMENTS

### CHAPTER ONE

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#### FUTURE LAND USE ELEMENT Data, Inventory, and Analysis Report

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#### AVAILABILITY OF SERVICES AND FACILITIES

Page 1-12

##### *Potable Water*

The Town of Davie owns and operates two Water Treatment Plants (WTP) and distribution systems. However, the plants are not of sufficient size to provide potable water to all residents. Therefore, portions of the Town are served by other utility providers (Tyndall Hammock Utilities, City of Hollywood, Broward County, City of Fort Lauderdale and City of Sunrise).

In 2007 the South Florida Water Management District adopted a regional water availability rule that limited water resources within the Lower East Coast region. As a result, the Town of Davie has determined that the Biscayne Aquifer water source that had been planned as the source for all the Town's future water needs can no longer be used to meet those future demands. The City has evaluated the impact of since implemented ation of new alternative water sources to meet this shortfall in its future planned needs and. As part of this evaluation population growth projections and water demands were matched to the Lower East Coast Water Supply Plan and to Broward County's population plans, as well as additional demands by the RAC and TOC re-development areas. A water supply work plan was then formulated that matched alternative source water development with water demand projections as outlined in the Town's water supply facilities work plan. growth. The results is a plan that the Town can fund from cash reserves as well as use alternative funding sources if desired for the planning horizon. next five to ten years. The plan is designed to minimize the Town's risk by providing significant flexibility with the timing of new facilities, thus minimizing capital outlay until it is actually needed. The Town has already constructed a new 6MGD reverse osmosis water treatment plant with an ultimate capacity of 12 MGD. The Town has more than sufficient water availability to meet the projected demand of 075.22 MGD within the Town of Davie utility service area through 2035.

The RO facility and other potable water and alternative water supply projects have been funded through rates, charges and ~~other~~ connection ~~type of~~ fees adopted on December 17, 2007.

## **REDEVELOPMENT**

**Page 1-17**

### *Potable Water*

In order to meet its adopted LOS for potable water throughout the planning period and develop alternative water supply sources in conformance with state requirements, the Town is has constructed~~proposing to develop~~ a 6 million gallons per day reverse osmosis water treatment plant with an ultimate capacity of 12 million gallons per day. In addition the Town has implemented, ~~there are~~ several water conservation measures and other capital improvements related to potable water planned, as detailed in the Water Supply Facilities Work Plan, ~~also detailed in the Data, Inventory and Analysis for the Infrastructure Element and in the proposed Schedule of Capital Improvements (SCI)~~. Taken in combination, ~~In combination with the capacity figures for the other potable water providers for the Town, the infrastructure improvements and conservation measures~~ will reduce demand and bring the system's total permitted design capacity to 102.5 MGD, which is sufficient to meet projected demand through 2035, ~~in 2018~~. Based upon the above referenced ~~modified population projections~~, the Town and the other utility providers will have to provide at least 16.31 MGD to maintain the current level of service for potable water for the planning period. Thus, ~~the capital improvements~~ The Town will continue to provide satisfactory LOS throughout the planning period, ~~even with the addition of the proposed RAC and TOC intensity increase~~.

# WATER SUPPLY FACILITIES WORK PLAN AMENDMENTS

## CHAPTER THREE

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### INFRASTRUCTURE ELEMENT Data, Inventory, and Analysis Report

---

#### POTABLE WATER

Page 3-3

This section evaluates the potable water system serving the Town of Davie. ~~Potable water facilities are defined in Rule 9J-5.003, F.A.C. as “a system of structures designed to collect, treat, or distribute potable water, and includes water wells, treatment plants, reservoirs and distribution mains.”~~

Page 3-4 thru Page 3-9

#### *Water Source*

The Biscayne Aquifer and Floridan Aquifer is currently the City’s source of potable water. The Town is ~~planning to~~ has added a Reverse Osmosis facility to draw water from the Floridan Aquifer. This ~~facility plan~~ is further described under the “Alternative Water Supply Plan” section below.

#### *Water Treatment Plant (WTP)*

The Town of Davie's potable water system includes two water treatment facilities, ~~the north water treatment plant (System I) and the south water treatment plant (System III)~~. The permitted allocation is ~~7.24 MGY~~ 2020 million gallons per year, or approximately ~~21.46553 million gallons per day (MGD)~~.

~~The north water treatment plant has a rated capacity of 3.4 MGD, and is located near the intersection of Davie Road and S.W. 38 Court. The Town has two 0.3 million gallon finished water storage tanks, a 20,000 gallon hydropneumatic tank, a 17,000 gallon clearwell and a 52,000 gallon clearwell located at the north water treatment plant. Four wells located on the property supply the plant with surficial water from the Biscayne Aquifer. The water from the wells is treated via lime softening, filtration, and disinfection.~~

~~The south treatment plant System III has a rated capacity of 4.0 MGD, and is located south of Stirling Road, at the end of N.W. 76<sup>th</sup> Avenue. There are two 2.0 million gallon finished water storage tanks, and one 142,000 gallon clearwell located on the property. The south plant is also supplied by four wells located on the property. The water is treated via lime softening, filtration, and disinfection. System V has a rated capacity of 6MGD and is located on the north side of SW 30<sup>th</sup> Street near College Avenue.~~

~~The North Treatment Plant is nearing the end of its useful life, and is scheduled to be closed after a new reverse osmosis (RO) facility is completed. A 6.0 MGD new reverse osmosis water treatment plant to draw water from the Floridian Aquifer is scheduled to be developed in an area in the central portion of the Town in or near the South Florida Educational Center.~~

~~In addition, the Fernerest Utilities provides service to an area approximately 800 acres in size, and with a 2007 projected population of 5,615. The plant utilizes four wells to draw potable water from the Biscayne Aquifer, and has a rated capacity of 2.0 MGD, and a maximum withdrawal allocation of 0.74 MGD.~~

~~Since the Sunrise Utilities services multiple jurisdictions, determining the amount of their total capacity which is available to the Town of Davie residents is more difficult. However, based upon the projected populations of the Town of Davie Utilities service area and the Fernerest Utilities service area, a calculation can produce estimates of the projected populations for the Town of Davie residents served by Sunrise. Specifically, by adding the service area populations of the Town of Davie Utilities and the Fernerest Utilities, and then subtracting that figure from the total Town of Davie population estimates for that year, an estimate for the portion of the Town of Davie population served by the City of Sunrise may be obtained. Then that estimate can be converted into a percentage of the total City of Sunrise service area population by dividing the Town of Davie population served by Sunrise by the total service area population of the City of Sunrise service area. This percentage can be used to calculate the amount of the City of Sunrise's capacity which is available to the Town of Davie residents by simply applying the percentage to the total capacity of the Sunrise Utilities. Based upon these calculations, it has been determined that there is approximately 8 MGD of Sunrise's total capacity which will be available to serve the Town of Davie residents throughout the planning period.~~

#### *Potable Water Level of Service*

~~The currently-adopted (prior to the EAR-based amendments) level of service (LOS) standard for potable water in the Town of Davie Comp Plan is 15045 gallons per capita per day (gpcd). The Town has reviewed this level of service standard in light of recent conservation efforts and has determined that the Town's leak detection and water conservation programs have had the effect of reducing water consumption. Therefore, the Town will reduce its LOS for potable water at 145 gallons per capita per day.~~

### Storage Capacity

As referenced above, the Town's water treatment plants include four finished water storage tanks, with a total capacity of 4.610 million gallons.

### Existing Potable Water Demand

In 2005 there was a demand for approximately 4.63 MGD average daily flow from the Town of Davie's WTP. Given the Town of Davie's 2005 utilities service area population of 31,651, there was a 2005 per capita demand of 146.28 gallons per day. In addition, there was an average daily demand for 0.74 MGD for potable water from the Ferncrest Utilities plant. With a 2005 service area population of 5,372, the Ferncrest per capita demand equaled 137.75 gallons per day. Lastly, in 2005 the Town residents generated an average daily demand of 5.17 MGD for potable water from the City of Sunrise's Utility Department. With a 2005 service area population of 47,012, the Sunrise Service Area per capita demand equaled 110 gallons per day. In total, there was an average daily demand for potable water for the Town of 10.54 MGD.

### Projected Potable Water Demand

~~As evidenced above, projecting potable water demand for the Town of Davie involves calculation of the population, usage rate, and capacity is more complicated than simply using the current usage rate and multiplying by projected population. This is because the potable water supply is provided by for all six separate utility providers within the Town: Town of Davie, City of Sunrise, Broward County, City of Hollywood, City of Fort Lauderdale, and Ferncrest Utilities. As a result, all supply figures and data must incorporate the demands and capacities of all six utilities. Calculations must also consider the fact that according to the Town's most recent Consumptive Use Permit (CUP) approximately 7% of the potable water produced by the Town's north and south System III and System V WTPs continues to be lost or unaccounted for. Thus, the daily WTP production of potable water must be at least 7% more than the daily potable water demand. Table 1 below indicates the amount of projected water loss over the planning period, and the total potable water capacity needs based upon that loss ratio.~~

~~The Town intends to undertake an aggressive water use conservation program. The Town currently employs several water conserving methods, including distributing educational materials, requiring water conserving devices for new construction and redevelopment, encouraging xeriscape landscape techniques and discouraging the use of potable water for irrigation. In order to further these goals, policies have been added to the Goals, Objectives and Policies of this Infrastructure Element to encourage the continued use of these water conservation measures, and to develop and implement new water conservation measures. These measures are expected to lead to the reduction of the per capita demand for potable water.~~

~~In order to assess whether the Town has adequate capacity to maintain its LOS, the Town will also assume that approximately 7% of the potable water produced by the different WTPs continues to be lost or unaccounted for, based upon figures from the Town's most recent Consumptive Use Permit (CUP). Thus, it is assumed that daily WTP production of potable water~~

**Commented [PL1]:** To be updated prior to adoption based on updated data from other water suppliers.

must be 7% more than the level required by the population multiplied by the per capita LOS standard. Table 2 below indicates the amount of projected water loss over the planning period, and the total potable water capacity needs based upon that loss ratio.

**Table 1: Projected Potable Water Demand and Capacity Through 201830**

Year	Service Area Populations		Projected Billed Usage (MGD)		Total Usage (MGD)	7% Loss Ratio MGD	Production Needed MGD
	Davie SA	Other Providers SA	Davie	Other Providers			
2008	31,366	61,703	4.55	7.68	12.23	0.87	13.09
2009	31,965	62,438	4.57	7.77	12.34	0.88	13.2
2010	32,575	63,182	4.74	7.86	12.60	0.90	13.5
2011	33,198	63,935	5.19	7.96	13.15	0.91	14.0
2012	33,832	64,696	5.65	8.06	13.71	0.92	14.6
2013	34,478	65,613	6.10	8.17	14.27	0.94	15.2
2014	35,136	66,350	6.55	8.27	14.82	0.95	15.8
2015	36,631	67,117	7.00	8.37	15.37	0.98	16.4
2016	37,096	67,717	7.47	8.44	15.91	0.99	17.0
2017	37,567	68,325	7.95	8.52	16.47	1.00	17.6
2018	38,044	68,967	8.52	8.60	17.02	1.01	18.2

**Commented [PL2]:** To be updated prior to adoption based on updated date from other water suppliers.

**Note:** Includes projections for the redevelopment of the TOC and RAC  
 Utilizes 2007 TAZ data for consistency and accuracy  
 Utilizes 145 LOS for the Town of Davie

**Table 2: Water Loss Ratio and Total Capacity Needs**

Year	Total Usage (MGD)	7% Loss Ratio (MGD)	Production Needed (MGD)
2008	12.23	0.87	13.09
2009	12.34	0.88	13.22
2010	12.60	0.90	13.50
2011	13.15	0.91	14.09
2012	13.71	0.92	14.68
2013	14.27	0.94	15.28
2014	14.82	0.95	15.87
2015	15.37	0.98	16.46
2016	15.91	0.99	17.05
2017	16.47	1.00	17.64
2018	17.02	1.01	18.23

Source: Town of Davie Utilities, Iler Planning Group

As noted earlier, currently the Town, in combination with the other utility providers serving the Town, conservatively has the capacity to produce [14.66 MGD], which is sufficient to serve the

**Commented [PL3]:** To be updated prior to adoption based on updated data from other water suppliers.

Town's projected population through the end of the planning period, ~~without water loss. Given a water loss ratio of 7%, that capacity is only sufficient for the potable water needs through 2014. However, the north treatment plant is to be retired (reducing capacity by 2.63 MGD), and a~~ This is due in large part to a new 6 MGD reverse osmosis treatment plant is to be that was recently constructed to take its place. The retirement of the old plant and the development of the new plant will result in a net increase of 4 MGD. Thus, the ~~future~~ capacity of the Town's water supply system will be 102.50 MGD, which is well in excess of the amount needed to serve the Town's projected population through the new long range planning horizon of 2030~~48~~.

#### *Reducing Demand through Conservation*

The Town currently employs several water conserving methods, including distributing educational materials, requiring water-conserving devices for new construction and redevelopment, encouraging xeriscape landscape techniques and discouraging the use of potable water for irrigation. In order to further these goals, policies have been added to the Goals, Objectives and Policies of this Infrastructure Element to encourage the continued use of these water conservation measures, and to develop and implement new water conservation measures. These measures are expected to lead to the reduction of the per capita demand for potable water.

#### *Alternative Water Supply Plan (AWSP)*

The Town has developed an Alternative Water Supply Plan (AWSP) based upon the development of a new reverse osmosis (RO) water treatment plant, and associated facilities. The newly constructed plant ~~will expand~~s the potable water system by maintaining some of the existing Biscayne Aquifer water supply sources, and adding capacity from the alternative resource of the Floridian Aquifer. ~~In total, the existing potable water supply capacity is planned to increase by approximately 4 MGD by 2012. The entire program through 2018 is planned to result in an approximately 12.5 MGD combined capacity system at a cost of approximately \$32.52 million.~~

~~The new RO plant will draw water from the Floridian Aquifer. The Town will seek grants and appropriations from the State and Federal governments, as well as from the South Florida Water Management District (SFWMD) for the development of this alternative water source. In addition, there are several other capital improvements related to potable water planned, which are described in the Schedule of Capital Improvements (SCI). The proposed improvements will bring the system's total capacity to approximately 12.5 MGD. When combined with the water supply capacity of the other utility providers, there is a total system capacity of approximately 18 MGD. With the addition of this 6 MGD reverse osmosis treatment plant, approximately 33% of the Town's water will be supplied by alternative sources. In addition, the City of Sunrise is planning on developing a 7 MGD reverse osmosis treatment plant to draw potable water from the Floridian Aquifer by 2009, and develop a 2 MGD reclaimed water system by 2016. Assuming the same percent of the City of Sunrise's alternative water sources would be utilized in Davie as are the traditional water sources, there would be an additional 2.25 MGD of alternative source water provided to Town residents. Thus, 46% of the Town's water would be supplied by alternative sources by the year 2016.~~

Based upon recent water usage rates and the above referenced modified population projections, the potable water demand at the end of the 2035 planning period will be 45.39 MGD. ~~The capital improvements will continue sufficient to provide satisfactory LOS and meet demand throughout the planning period.~~

The Town's AWSP program is based on three elements: 1) the existing Biscayne Aquifer supplies; 2) Floridan Aquifer supplies treated via reverse osmosis (because these supplies are brackish water prior to treatment); and 3) five additional water system interconnections (i.e. to the City of Sunrise system, Broward County, City of Hollywood, City of Fort Lauderdale and the Ferncrest Utilities system in the sub-region). The program includes interim water supply measures until the system is completed. Included in these interim measures are: amendment to the Land Development Code to require irrigation quality utilities within new developments (purple pipe) for non-potable purposes; a water conservation program; and water system replacements.

~~The proposed Schedule of Capital Improvements (SCI) included in the Capital Improvements Element (CIE) shows several capital projects to begin implementation of the AWSP.~~

#### *Statute Updates*

In order to ensure the maintenance of potable water concurrency and to ensure compliance with ~~new requirements passed by the Legislature in 2005 as part of Senate Bill (SB) 360, and as recommended in the EAR,~~ bills enacted by the Florida Legislature in the 2002, 2004, 2005, and 2011 sessions to address the state's water supply needs, new policies ~~will have been~~ added to the Goals, Objectives and Policies of the Capital Improvements, Infrastructure, and Intergovernmental Coordination Elements, regarding the development of alternative water supplies and ~~a potable water concurrency requirement, as well as the incorporation of a 10 Year Water Supply Facilities Work Plan~~ with a minimum planning horizon of 10 years.

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## GOALS, OBJECTIVES, AND POLICIES

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### INFRASTRUCTURE UTILITIES: GOALS, OBJECTIVES AND POLICIES

All departments in the Town participating in the implementation of this Element shall be required to operate within the framework established by the Goals, Objectives and Policies. All decision-making with regard to capital improvements and expenditures, shall reflect the Goals, Objectives and Policies. Annual budget review and capital improvement programming shall reflect consideration of needs that have been determined with respect to the Goals, Objectives and Policies.

Town land development regulations shall be amended, as necessary, to implement the requirements of this Element.

The following procedures address the requirement of Chapter 9J-5, F.A.C. to provide monitoring and evaluation procedures for each element:

- ~~Continued compliance with regulations promulgated by appropriate regulatory agencies which address the quality and quantity of services (Objectives 1,6).~~
- ~~Coordination with providers of services within the Town other than the Town of Davie, to insure adequate services at acceptable levels of service (Objectives 2,7).~~
- ~~Demonstrable growth in the number of customers served, in accordance with the Capital Improvements Program (Objectives 3,8).~~
- Maintenance of favorable bond rating for municipal improvements.

### MONITORING AND EVALUATION

The following procedures address the requirement of Chapter 9J-5, F.A.C., to provide monitoring and evaluation procedures for each element:

- ~~Continued compliance with regulations promulgated by appropriate regulatory agencies which address the quality and quantity of services (Objectives 1, 6).~~
- ~~Coordination with providers of services within the Town other than the Town of Davie, to ensure adequate services at acceptable levels of service (Objectives 2, 7).~~
- ~~Demonstrable growth in the number of customers served, in accordance with the Capital Improvements Program (Objectives 3, 8).~~
- ~~Maintenance of favorable bond rating for municipal improvements.~~

The Town shall annually:

- Evaluate adopted Levels of Service for potable water, sanitary sewer, solid waste, and drainage facilities to determine if standards adopted in this Element have been met.
- Assess compliance with the concurrence management system through determination of whether or not adequate Levels of Service for utilities facilities serving Davie have been met.
- Update capacity and demand information on an annual basis for utilities facilities serving Davie.
- Monitor the extent of urban sprawl through an analysis of service and facility extensions. The analysis shall consider compliance with Policies 3-1 and 9-1 which promote development within areas where facilities and services are available before extending service areas.
- Assess coordination mechanisms with Broward County on the closed Broward Landfill clean-up by evaluating groundwater impacts and progress toward creating a park facility on the site.

# WATER SUPPLY FACILITIES WORK PLAN AMENDMENTS

## CHAPTER FOUR

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### PARKS, RECREATION, OPEN SPACE AND CONSERVATION ELEMENT Data, Inventory, and Analysis Report

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#### CONSERVATION

Page 4-6 thru Page 4-7

##### *Current and Projected Potable Water Needs*

~~Rule 9 J5.013(1)(c) requires that a local government determine its current and projected water needs for the 10 year planning horizon, and identify new water supply sources to serve future demand. Thus, the analysis for the Infrastructure Element of this Comprehensive Plan update provides an inventory of the current and projected water needs and potential sources to the year 2018. The projections are based on present water consumption demands in the Town, and population projections shown in the FLUE DIA.~~

##### *Existing Potable Water Sources*

The Town of Davie provides potable water production and distribution to only a portion of its residents. In order to provide complete coverage throughout the Town, potable water service is also provided by Ferncrest Utilities, City of Hollywood, City of Fort Lauderdale, Broward County and the City of Sunrise. The Biscayne Aquifer is the current source of potable water for all of Broward County, including the Town of Davie. However, the Town has developed an Alternative Water Supply Plan (AWSP) which includes the expansion of the existing wastewater treatment plant, the construction of a new wastewater treatment facility and a reverse osmosis water treatment plant. ~~These facilities will increase the Town's treatment capacity by 6 MGD.~~ More detail on the new facilities and the AWSP is provided in the Infrastructure Element Data, Inventory and Analysis (DIA) Report.

##### *Existing and Projected Potable Water Capacity and Demand*

A detailed discussion of potable water demand over the planning horizon is given in the Infrastructure Element Data, Inventory and Analysis (DIA) Report. Table 2 below shows the results of the analysis of projected potable water demand through ~~2018~~2030:

**Table 2: Projected Potable Water Demand and Capacity Through 2030**

Year	Service Area Populations		Projected Billed Usage (MGD)		Total Usage (MGD)	7% Loss Ratio MGD	Production Needed MGD
	Davie SA	Other Providers SA	Davie	Other Providers			
2008	31,366	61,703	4.55	7.68	12.23	0.87	13.09
2009	31,965	62,438	4.57	7.77	12.34	0.88	13.2
2010	32,575	63,182	4.74	7.86	12.60	0.90	13.5
2011	33,198	63,935	5.19	7.96	13.15	0.91	14.0
2012	33,832	64,696	5.65	8.06	13.71	0.92	14.6
2013	34,478	65,613	6.10	8.17	14.27	0.94	15.2
2014	35,136	66,350	6.55	8.27	14.82	0.95	15.8
2015	36,631	67,117	7.00	8.37	15.37	0.98	16.4
2016	37,096	67,717	7.47	8.44	15.91	0.99	17.0
2017	37,567	68,325	7.95	8.52	16.47	1.00	17.6
2018	38,044	68,967	8.52	8.60	17.02	1.01	18.2

**Commented [PL1]:** To be updated prior to adoption based on updated data from other water suppliers.

**Note: Includes projections for the redevelopment of the TOC and RAC  
Utilizes 2007 TAZ data for consistency and accuracy  
Utilizes 145 LOS for the Town of Davie**

The Town's potable water demand is approximately 18 MGD. The combined capacity of all utility providers within the Town of Davie will exceed the projected demand and is more than sufficient to provide potable water service to the Town residents throughout the planning period. Specifically, the Town of Davie Utilities will has increased its total capacity to approximately 10 MGD over the next four years, with the opening of the new reverse osmosis plant. Ferncrest Tyndall Hammock Utilities is proposing to keep production at about .74 MGD throughout the planning period. Since the Sunrise Utilities services multiple jurisdictions, determining the amount of their total capacity which is available to the Town of Davie residents is more difficult. However, based upon the estimated populations for the Town of Davie residents served by Sunrise, and a comparison of that population to the total service area population of the Sunrise Utilities, an approximate figure of available capacity can be determined. Based upon the calculations in the Infrastructure Element Data, Inventory and Analysis, there is approximately 8 MGD of Sunrise's total capacity which will be available to serve the Town of Davie residents throughout the planning period. Based upon that estimate, the total capacity available to serve the Town's potable water demand is approximately 18 MGD. Given the demand figures in Table 2 above, this is more than sufficient to provide potable water service to the Town residents throughout the planning period.

**Commented [PL2]:** To be updated prior to adoption based on updated data from other water suppliers

**Commented [PL3]:** To be updated prior to adoption based on updated data from other water suppliers.

**Commented [PL4]:** To be updated prior to adoption based on updated data from other water suppliers.

It should be pointed out, though, that the other service providers are responsible for maintaining an acceptable level of service for potable water throughout the planning period. Furthermore, the Town of Davie does not have any jurisdiction over these two-five potable water providers.

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## GOALS, OBJECTIVES, AND POLICIES

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*Page 5*

Policy 3.3.4 The Town shall continue to utilize a water rate structure that promotes water conservation by charging a per gallon rate for single-family residences that exceed a preset volume of water, and adjusts block rate and surcharges during SFWMD declared Phase I and II water restrictions, ~~as described in the 10 Year Water Supply Facilities Work Plan prepared by Calvin Giordano dated October 2008.~~

# WATER SUPPLY FACILITIES WORK PLAN AMENDMENTS

## CHAPTER NINE

### CAPITAL IMPROVEMENTS ELEMENT Data, Inventory, and Analysis Report

#### CAPITAL IMPROVEMENT DATA

Page 9-3

<u>Project</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>Funding Source</u>
<u>Tyndall Hammock Master Meter Installation</u>	<u>\$200,000</u>					<u>Utilities Contribution Charges and Impact Fees</u>
<u>Water and Sewer Line Installation (SW 83 Terrace)</u>	<u>\$530,000</u>					<u>Utilities Contribution Charges and Impact Fees</u>
<u>Water Main Replacement</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>Utilities Capital Replacement Account</u>

**Table 1: Existing and Projected Deficiencies Requiring Capital Improvements**

No.	Facility	Existing Deficiency(ED) / Projected Need (PN)	Fiscal Year(s)	Controlling Agency
<b>Transportation</b>				
1.	Hiatus Road North of SW 14 Street	PN	2008-2012	BCC MPO
2.	Pine Island Road North of Nova Drive	ED	2008-2012	BCC MPO
3.	SW 14 Street East of I-75	ED	2008-2012	BCC MPO
4.	Griffin Road East of 148 Avenue	ED	2008-2012	BCC MPO
5.	SR 84 East of SW 136 Avenue	ED	2008-2012	BCC MPO/FDOT
6.	I-595 East of Sawgrass Expressway	ED	2008-2012	BCC MPO/FDOT
7.	I-595 East of SW 136 Avenue	ED	2008-2012	BCC MPO/FDOT
8.	I-595 East of Flamingo Road	ED	2008-2012	BCC MPO/FDOT
9.	I-595 East of Hiatus Road	ED	2008-2012	BCC MPO/FDOT
10.	I-595 East of 100 Avenue	ED	2008-2012	BCC MPO/FDOT
11.	I-595 East of Pine Island Road	ED	2008-2012	BCC MPO/FDOT
12.	I-595 East of University Drive	PN	2008-2012	BCC MPO/FDOT
13.	I-595 East of Davie Road	PN	2008-2012	BCC MPO/FDOT
14.	I-595 East of Florida's Turnpike	ED	2008-2012	BCC MPO/FDOT
15.	Florida's Turnpike North of Griffin Road	ED	2008-2012	BCC MPO/FDOT
16.	State Road 7 North of Orange Drive	PN	2008-2012	BCC MPO/FDOT
<b>Drainage</b>				
17.	Eastridge Drainage, Phases II and III	ED	2008 & 2009	Town of Davie
<b>Potable Water</b>				
18.	Water Treatment Plant - Capacity to produce 6 MGD.	ED	2008-2010	Town of Davie
<b>Wastewater Treatment</b>				
19.	New Wastewater Treatment Plant – Capacity to treat 4 MGD	ED	2008	Town of Davie

**Table 7: Level of Service (LOS) Standards for the Town of Davie (Proposed)**

Public Facility	Level of Service Standard
Potable Water	<del>Water Treatment Plant Production – capacity to produce at least 10.06-11 MGD (2018 Projected billed usage for the Davie Service Area multiplied by an expected water loss ratio of 7%.</del> User LOS (peak) – 14550 gallons per capita per day (gpcd)
Sanitary Sewer	110 gallons per capita per day (gpcd)
Stormwater Drainage	1) Adequate to accommodate runoff from a 25-year, 3-day storm event; 2) Post development runoff shall not exceed pre-development rates; and 3) All stormwater treatment and disposal facilities shall meet the design and performance standards established in Chapter 17-25, Florida Administrative Code (F.A.C.)
Solid Waste	Disposal shall not exceed a generation rate of 8.9 pounds per residential unit per day.
Recreation/Open Space	2008-2018: At least 10 acres per 1,000 population
Transportation:	- All state, county or local roadways including state principal arterial, state minor arterial, and city collectors shall be maintained at Level “D” status or higher as defined by the State of Florida Department of Transportation, except in cases where another entity is responsible for a roadway within the Town and has – with proper authority – established a higher level of service. - All county and local roadways within the Broward County South Central Transit Oriented Concurrency Exception Area are required to meet the provide transit oriented improvements or funds toward transit oriented improvements, according to the requirements of the Broward County Land Development Code.
Public School Facilities	110% of the permanent Florida Inventory of School Housing (FISH) capacity for each public elementary, middle and high school.

Capital Improvement Program

A capital improvement program (CIP) is a schedule for capital expenditures to be incurred each year over a fixed period of years (usually 5 years) to meet anticipated capital needs. The CIP is revised annually and adopted by the Town Council typically with the first year converting into the annual capital budget. The mechanism for implementing the CIP is the Five-Year Schedule of Capital Improvements (SCI).

The CIP must be consistent with the Capital Improvements Element of the Comprehensive Plan, and address the projects required to maintain and improve the adopted Level of Service standards, ~~where applicable, in accordance with the provisions of Rule 9J-5, F.A.C.~~ Furthermore, the CIP must reflect the goals, objectives and policies of this Comprehensive Plan and its implementation strategies. The CIP is generally more inclusive than the SCI as it contains small scale recurring projects (less than \$25,000) that do not require multi-year financing as well as those public facilities not addressed in the Comprehensive Plan.

The Five-Year Schedule of Capital Improvements (SCI) (Table 8) lists, along with other projects, those capital facilities identified to correct existing deficiencies and provide for projected needs of facilities for which the Town has operation and maintenance responsibility. The SCI projects, plus improvements by other governmental entities charged with operation and maintenance of certain infrastructure within the Town, should maintain the minimum LOS standards set forth in this Comprehensive Plan to support the land uses and densities/intensities set forth in the Future Land Use Element.

### *Financial Feasibility Analysis*

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~~Florida State Statutes now require that local government comprehensive plans be financially feasible. Financial feasibility is defined by s. 163.3164(32), Florida Statutes (F.S.) as follows:~~

~~"Financial feasibility" means that sufficient revenues are currently available or will be available from committed funding sources for the first 3 years, or will be available from committed or planned funding sources for years 4 and 5, of a 5 year capital improvement schedule for financing capital improvements, such as ad valorem taxes, bonds, state and federal funds, tax revenues, impact fees, and developer contributions, which are adequate to fund the projected costs of the capital improvements identified in the comprehensive plan necessary to ensure that adopted level of service standards are achieved and maintained within the period covered by the 5 year schedule of capital improvements.~~

~~According to this definition, the 5-Year Schedule of Capital Improvements (SCI) must include projects on which the Town will rely to achieve and maintain its adopted level of service standards. Several capital improvements have been identified for the next five year planning period needed to achieve and maintain LOS standards. Existing deficiencies have been identified concerning transportation facilities, drainage, potable water and wastewater services. The SCI includes several projects to correct these deficiencies. The SCI identifies the funding source for each project needed within the planning period.~~

~~Table 8 below provides the Town's 5 Year SCI projects necessary to achieve and maintain the adopted level of service standards through 2013<sup>9</sup>. Committed funding sources have been identified for each project, and include impact fees, general funds, tax increment revenue, and grants. While facility improvements which are the responsibility of other public providers are included in the SCI, funding sources have not been specifically identified herein.~~

~~Also included in the proposed 5-Year SCI are projects to begin implementation of the Alternative Water Supply Plan (AWSP). These projects include alternative potable water supplies (totaling \$99,872,361 for 2009-2013). Specifically, there is a new water and wastewater treatment plant and associated infrastructure to be provided by 2013. The funding for these projects is to be provided via the utility rate increase which was approved through the adoption of Ordinance 2007-38. In addition, grants and other resources may become available later. Therefore, the AWSP projects in the SCI should be annually updated as grant sources and other information become clearer.~~

**Table 8: Five Year Schedule of Capital Improvements, FY2015-2019-2008-2012**

<u>Project</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>Funding Source</u>
<u>Tyndall Hammock Master Meter Installation</u>	<u>\$200,000</u>					<u>Utilities Contribution Charges and Impact Fees</u>
<u>Water and Sewer Line Installation (SW 83 Terrace)</u>	<u>\$530,000</u>					<u>Utilities Contribution Charges and Impact Fees</u>
<u>Water Main Replacement</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>\$424,000</u>	<u>Utilities Capital Replacement Account</u>

<u>Project</u>	<u>Location</u>	<u>Estimated Cost</u>	<u>Schedule</u>	<u>Funding Source</u>
Transportation				
Oakes Road Improvements	From SW 47 <sup>th</sup> to SW 51 <sup>st</sup> Street	\$373,295	2008-2009	FDOT TE Grant (\$309,744) and P&Z Operating Budget (\$63,551)
Pedestrian Transit Shelters	Within the RAC along University Dr., Davie Rd./Davie Rd. Extensions and Griffin Rd.	\$412,000	2008-2009	FDOT TE Grant (\$365,000) and General Fund (\$47,000)
Griffin Road	Between I-75 and Flamingo		Underway	Broward County MPO

I-595 Interchange Improvements	Between Davie Rd. and Turnpike	\$83,146,000	2009-2011	FDOT
I-595 Interchange Improvements	Between University Dr. and Turnpike	\$47,7686,000	2009-2011	FDOT
I-595 Add 1 and reconstruct 8 lanes	Between University Dr. and Davie Rd.	\$62,925,000	2008-2011	FDOT
Pine Island Rd.	Between I-595 and Nova Dr.	\$6,715,000	2011	Broward County MPO
Davie Road Add 2 lanes	Between Nova Drive and I-595	\$5,672,000	2008-2011	Broward County MPO
Davie Rd. Extension	Between University Dr. & Stirling Rd.	\$5,061,000	Pending	Broward County MPO
Florida Turnpike	Between Griffin Rd. and Sunrise Blvd.	\$3,300,000	Underway	FDOT
<b>Drainage</b>				
Phase II Eastridge Drainage	SW 38 Court and connecting L. Lake to N-5 Canal	\$855,000	2008	Tax Increment Revenue
Phase III Eastridge Drainage	Drainage for SW 63 Avenue to existing drainage at 41 Place	\$600,000	2009	Tax Increment Revenue
<b>Potable Water</b>				
New Water and Wastewater Plant & Infrastructure	3500 NW 76 Avenue	\$99,872,361	2009-2013	Utility Rate Increase—Ordinance 2007-38
<b>Wastewater</b>				
Wastewater Treatment Plant Expansion	3500 NW 76 Avenue	\$6,500,000	2009-2010	Utility Rate Increase—Ordinance 2007-38
LS 8 and Force Main Replacement		\$4,000,000	2009-2010	Utility Rate Increase—Ordinance 2007-38
<b>Parks and Recreation</b>				
Open Space Bond	Acquisitions and Improvements of Parks and Open Space Lands throughout Town	\$20,000,000	2008-2009	Open Space Funds
Linear Park		\$42,000	2008	Open Space Impact Fees
Equestrian	Townwide	\$40,000	2008	Open Space Impact Fees
Recreation	Townwide	\$145,000	2008-2009	Open Space Impact Fees

<del>Van Kirk Parcel</del>	<del>1750 SW 136<sup>th</sup> Avenue</del>	<del>\$790,000</del>	<del>2008-2010</del>	<del>Land and Water Conservation Fund Grant (\$200,000) and Open Space Impact Fees (\$590,000)</del>
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Generally, those capital facilities identified as needed to meet the Town's adopted levels of service standards over the planning timeframe are given first priority in capital improvements funding. This includes existing deficiencies in the areas of transportation and drainage through 2013 and 2018 (see Table 1). These issues are addressed through 2013 and, to a large extent through 2018, in the Town's Schedule of Capital Improvements (SCI). (See Table 8)

~~The next priority for capital projects is implementation of the Town's Alternative Water Supply Plan (AWSP). The Five Year SCI includes projects aimed at implementation of the AWSP provisions through 2012.~~

*Cost Analysis of Capital Improvements and Basis of Cost Estimates*

Due to inflationary factors associated with national and state economies, these costs are likely to increase over the extent of the planning period. The Town should update project costs on an annual basis to reflect more accurate project costs.

The method employed to reach cost estimates for each proposed capital improvement varies according to its respective public facility. The basis for these cost estimates is summarized as follows:

Transportation Improvements. The costs of the transportation improvements in the Schedule of Capital Improvements (SCI) for which the Town has financial responsibility were provided by the Town Engineer.

Drainage Improvements. All cost estimates for drainage improvements were based on plans for these improvements provided by the Town engineer.

Alternative Water Supply Plan facilities. All facilities listed in the SCI related to the Town's ~~10 Year~~ Water Supply Facilities Work Plan (WSFWP) as prepared by Calvin Giordano dated ~~October 2008~~ March 2015. The WSFWP is are based on submissions made by the Town to the South Florida Water Management District, and as identified in the 2013 Lower East Coast Water Supply Plan Update prepared by the Town's consultant.

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## GOALS, OBJECTIVES, AND POLICIES

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**OBJECTIVE 5: Implementation of a concurrency management system (CMS) that will ensure that new development and redevelopment does not degrade public facility levels of service below adopted levels and is consistent with requirements of Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.).**

Policy 5-1 Adopt the CMS into the land development regulations, ~~which shall be consistent with the CMS requirements of Rule 9J-5, Florida Administrative Code.~~

Policy 5-2 Pursuant to Florida Law, the CMS shall mandate that no development orders will be issued unless public facilities exist or are assured (i.e. in the Five Year SCI or through an enforceable development agreement, etc.) to meet or exceed the level of service standards concurrent with the impacts of development, or that development will be phased such that concurrency is maintained.

Policy 5-3 The following are the levels of service (LOS) standards adopted in the appropriate Comprehensive Plan elements:

1. Potable Water:
  - 145 gallons per capita per day (gpcd)
2. Sanitary Sewer:
  - 110 gpcd
3. Solid Waste:
  - 8.9 pounds per unit per day
4. Parks and Recreation:
  - 10 acres per 1,000 population
5. Transportation:
  - Pursuant to Policies 2.1.1 through 2.1.5 of the Transportation Element.
6. Schools:
  - 100% of gross capacity (with relocatable classrooms) for each CSA until the end of the 2018/19 school year; and commencing at the 2019/20 school year, the LOS for each CSA shall be 110% of permanent Florida Inventory of School Housing (FISH) capacity Policy 5-4 Allow for a system of proportionate fair-share mitigation of transportation facilities to meet the transportation concurrency requirement.

Policy 5-5 Through land development regulations and development review procedures the Town will coordinate the approval of new developments and entitlements with the availability of financially feasible water supply facility projects, as defined, described and scheduled in the Town's five year Schedule of Capital Improvements, and in accordance with the Town's ~~10-Year~~ Water Supply Facilities Work Plan.

TOWN OF DAVIE FY2015-2019 CIP  
Potable Water Projects

Project	2015	2016	2017	2018	2019	Funding Source
<u>Tyndall Hammock Master Meter Installation</u>	\$200,000					<u>Utilities Contribution Charges and Impact Fees</u>
<u>Water and Sewer Line Installation (SW 83 Terrace)</u>	\$530,000					<u>Utilities Contribution Charges and Impact Fees</u>
<u>Water Main Replacement</u>	\$424,000	\$424,000	\$424,000	\$424,000	\$424,000	<u>Utilities Capital Replacement Account</u>

Source: Town of Davie FY2015-2024 Capital Improvement Program

Capital Improvement Project	Requesting Department	FY2011	FY2011	FY2013	FY2014	FY2015	TOTAL	Funding Source	Project Number
Life Service Rehab	Utilities	\$200,000	\$200,000				\$400,000	Utilities Renewal and Replacement Fund	UTIL1
Life Service Telemetry	Utilities	\$200,000	\$200,000	\$200,000			\$600,000	Utilities Reserve	UTIL1
Line Basin Repair	Utilities	\$420,000					\$420,000	Utilities Renewal and Replacement Fund	UTIL3
LS #6 and Force Main Replacement	Utilities	\$4,450,000					\$4,450,000	Utilities Reserve (\$3,821,550) and Utilities Renewal and Replacement Fund (\$1,567,442)	UTIL4
New Water and Wastewater Plant & Infrastructure	Utilities	\$35,000,000	\$35,000,000	\$10,000,000			\$80,000,000	2011 Water and Sewer Bonds	UTIL5
Raw Water Production Well	Utilities	\$382,000					\$382,000	Utilities Reserve	UTIL5
	Utilities Total	\$40,862,000	\$75,430,000	\$10,300,000	\$0	\$0	\$86,392,000		
College Avenue Improvement Phase I (SR84 to Nova Drive)	Utilities (Engineering)		\$2,320,000				\$2,320,000	Grant (CIGF - 51.16 M), FAU Campus Agreement (2015) and Engineering Reserve (\$140)	ENGE0
College Avenue Improvement Phase II (Nova Drive to SW 50 St)	Utilities (Engineering)		\$465,000	\$1,932,000			\$2,397,000	FY11 - General Fund Reserve; FY12 - Grant (CIGF - 5006) and Engineering Reserve (5006)	ENGE2
NW 154th Ave and 2308 Blvd Drainage	Utilities (Engineering)			\$40,000	\$40,000		\$80,000	General Fund Reserve	ENGE3
SW 20 Street Improvement	Utilities (Engineering)			\$147,000	\$1,082,400		\$1,229,400	General Fund Reserve	ENGE4
NW 20 Street Improvement	Utilities (Engineering)			\$343,000	\$2,177,000		\$2,520,000	General Fund Reserve	ENGE5
	Utilities (Engineering) Total		\$2,785,000	\$2,470,000	\$3,999,400	\$0	\$9,254,400		

	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	ALL YEARS
<b>FY2011-15 CIP Grand Total</b>	<b>\$50,732,464</b>	<b>\$45,136,314</b>	<b>\$27,397,000</b>	<b>\$3,050,500</b>	<b>\$3,610,200</b>	<b>\$129,927,378</b>