

CITY OF BOCA RATON, FLORIDA

WATER SUPPLY FACILITIES WORK PLAN

Prepared By:

**City of Boca Raton Planning and Zoning Department
and Utility Services Department**

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1.0 INTRODUCTION

The purpose of the City of Boca Raton's Water Supply Facilities Work Plan is to identify and plan for the water supply sources and facilities needed to serve existing and new development within the local government's jurisdiction. Chapter 163, Part II, F.S., requires local governments to prepare and adopt Work Plans into their comprehensive plans within 18 months after the water management district approves a regional water supply plan or its update. The *Lower East Coast Water Supply Plan Update* was approved by the South Florida Water Management District (SFWMD) on September 12, 2013. Therefore, the deadline for local governments within the Lower East Coast jurisdiction to amend their comprehensive plans to adopt a Work Plan is March 12, 2015.

Residents of the City of Boca Raton as well as a portion of Palm Beach County residents obtain their water directly from the City of Boca Raton Utility Services Department, which is responsible for ensuring that enough capacity is available for existing and future customers.

The City of Boca Raton's Water Supply Facilities Work Plan (Work Plan) will reference the initiatives already identified in the City of Boca Raton's Comprehensive Plan. According to state guidelines, the Work Plan and the comprehensive plan amendment must address the development of traditional and alternative water supplies, bulk sales agreements and conservation and reuse programs that are necessary to serve existing and new development for at least a 10-year planning period. The City of Boca Raton's Water Supply Facilities Work Plan will have the same planning time schedule as and is incorporated as a sub-element to the City of Boca Raton's Comprehensive Plan

The City's Work Plan is divided into five sections:

Section 1 – Introduction

Section 2 – Background Information

Section 3 – Data and Analysis

Section 4 – Work Plan Projects/Capital Improvement Element/Schedule

Section 5 – Goals, Objectives, Policies

1.1 Statutory History

The Florida Legislature has enacted bills in the 2002, 2004, and 2005 sessions to address the state's water supply needs. These bills, especially Senate Bills 360 and 444 (2005 legislative session), significantly changed Chapter 163 and 373 Florida Statutes (F.S.) by strengthening the statutory links between the regional water supply plans prepared by the water management districts and the comprehensive plans prepared by local governments. In addition, these bills established the basis for improving coordination between the local land use planning and water supply planning.

1.2 Statutory Requirements

Each local government must comply with the following requirements:

1. Coordinate appropriate aspects of its comprehensive plan with the appropriate water management district's regional water supply plan, [s.163.3177(4)(a), F.S.]
2. Ensure that its future land use plan is based upon availability of adequate water supplies and public facilities and services [s.163.3177(6)(a), F.S., effective July 1, 2005]. Data and analysis demonstrating that adequate water supplies and associated public facilities will be available to meet projected growth demands must accompany all proposed Future Land Use Map amendments submitted to the Department for review. The submitted package must also include an amendment to the Capital Improvements Element, if necessary, to demonstrate that adequate public facilities will be available to serve the proposed Future Land Use Map modification.
3. Ensure that adequate water supplies and facilities area available to serve new development no later than the date on which the local government anticipates issuing a certificate of occupancy and consult with the applicable water supplier prior to approving building permit, to determine whether adequate water supplies will be available to serve the development by the anticipated issuance date of the certificate of occupancy [s.163.3180 (2)(a), F.S., effective July 1, 2005]. This "water supply concurrency" is now in effect, and local governments should be complying with the requirement for all new development proposals. In addition, local governments should update their comprehensive plans and land development regulations as soon as possible to address these statutory requirements. The latest point at which the comprehensive plan must be revised to reflect the concurrency requirements is at the time the local government adopts plan amendments to implement the recommendations of the Evaluation and Appraisal Report (EAR).
4. For local governments subject to a regional water supply plan, revise the General Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element (the "Infrastructure Element"), within 18 months after the water management district approves an updated regional water supply plan, to:
 - a. Identify and incorporate the alternative water supply project(s) selected by the local government from projects identified in the updated regional water supply plan, or the alternative project proposed by the local government under s. 373.0361(7), F.S. [s. 163.3177(6)(c), F.S.];
 - b. Identify the traditional and alternative water supply projects, bulk sales agreements, and the conservation and reuse programs necessary to meet current and future water use demands within the local government's jurisdiction [s. 163.3177(6)(c), F.S.]; and
 - c. Include a water supply facilities work plan for at least a 10-year planning period for constructing the public, private, and regional water supply facilities identified in the element as necessary to serve existing and new development. [s. 163.3177(6)(c), F.S.] Amendments to incorporate the water supply facilities work plan into the comprehensive plan are exempt from the twice-a-year amendment limitation. [s. 163.3177(6)(c), F.S.]

5. Revise the Five-Year Schedule of Capital Improvements to include any water supply, reuse, and conservation projects and programs to be implemented during the five-year period.
6. To the extent necessary to maintain internal consistency after making changes described in Paragraph 1 through 5 above, revise the Conservation Element to assess projected water needs and sources for at least a 10-year planning period, considering the appropriate regional water supply plan, the applicable District Water Management Plan, as well as applicable consumptive use permit(s). [s.163.3177 (6)(d), F.S.]

If the established planning period of a comprehensive plan is greater than ten years, the plan must address the water supply sources necessary to meet and achieve the existing and projected water use demand for established planning period, considering the appropriate regional water supply plan. [s.163.3167 (13), F.S.]
7. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Intergovernmental Coordination Element to ensure coordination of the comprehensive plan with applicable regional water supply plans and regional water supply authorities' plans. [s.163.3177(6)(h)1., F.S.]
8. Address in the EAR, the extent to which the local government has implemented the 10-year water supply facilities work plan, including the development of alternative water supplies, and determine whether the identified alternative water supply projects, traditional water supply projects, bulk sales agreements, and conservation and reuse programs are meeting local water use demands. [s.163.3191 (2)(1), F.S.]

1.3 Regulatory Framework

The provision of potable water service by the Utility Services Department of the City of Boca Raton is subject to specific regulatory agency requirements. The Federal, State, and County agencies involved in the planning and implementation of public water facilities' improvements by the City are:

1. The U. S. Environmental Protection Agency
2. The Florida Department of Environmental Protection Agency
3. The Palm Beach County Health Department Health
4. The Palm Beach County Department of Environmental Resources Management
5. The South Florida Water Management District
6. The Lake Worth Drainage District

The first three agencies concern themselves mostly with the water quality and reliability of the water system. The last three agencies address the actual raw water supply source. The following subsections provide a brief description of how these agencies' policies and regulations affect the Boca Raton water system.

The Environmental Protection Agency (USEPA)

The primary responsibility of any potable water supplier is to provide safe and aesthetically pleasing water to its customers. In order to assure that this responsibility is met by Utility Services and other potable water suppliers, the Safe Drinking Water Act (SDWA) was enacted by the United States Congress in December 1974 (Public Law 93-523). The law directed the USEPA to establish minimum national drinking water standards. Several sets of regulations have since been promulgated by the USEPA to mandate and enforce the policies set forth in the SDWA.

The law allows each state to assume the responsibility of the SDWA program by adopting drinking water standards at least as strict as the national standards. The state must also be able to enforce the standards and monitor compliance with the requirements. The State of Florida has taken on this responsibility, and enforcement of the regulations is assigned to the Florida Department of Environmental Protection Agency (FDEP). The FDEP permits qualified health departments, such as the Palm Beach County Health Department to enforce the SDWA at the local level. The Federal standards are divided into primary standards, which are mandatory for public health purposes, and secondary standards, which are recommended for aesthetic quality reasons. In Florida, both primary and secondary standards are mandatory and enforced by the FDEP.

Florida Department of Environmental Protection Agency (FDEP)

In 1977, the Florida Legislature enacted the "Florida Safe Drinking Water Act", Sections 403.850-403.864 Florida Statutes. The FDEP promulgated the regulations contained in Chapter 17-22 of the Florida Administrative Code (FAC) to implement the requirements of the Florida SDWA.

As part of the commitment to ensure the provision of safe drinking water, the FDEP reviews and approves the final plans and specifications for the construction of public water supply facilities, including wells, raw water transmission mains, treatment facilities, and distribution works. The FDEP also has the responsibility for licensing water well contractors.

On July 1, 2008, Senate Bill 1302 was enacted requiring wastewater utilities that utilized ocean outfall for treated wastewater disposal to curtail the use of outfalls and become at least a 60% functioning reuse system by 2025. A provision in SB 1302 allows for wet weather discharge without advanced treatment requirements for those facilities that become 100% reuse by 2018. The City of Boca Raton Utility Services Department is directly affected by this bill and has become a 100% reuse facility well before the 2018 requirement. By implementing an aggressive reuse program, the City will replace the use of traditional sources of water for irrigation with reclaimed water, thus creating a positive impact on the regional system.

Palm Beach County Health Department (PBCHD)

PBCHD carries out a supportive role to the FDEP by reviewing all final drawings and specifications for construction of public water system facilities. After approval by the

The requirements of the Program address containment, emergency collection devices, emergency plans, inspection, maintenance of containment and emergency equipment, reporting of spills, monitoring for regulated substances in the protected potable water wells, monitoring for regulated substances in groundwater monitoring wells on the sites where the substances are used, alterations and expansions of uses of regulated substances, reconstruction after catastrophes, and financial responsibility.

The Wellfield Protection Ordinance requires permitting for the use of regulated substances in Zones 1, 2, 3 and 4 through best management practices and structural devices which serve to isolate high-risk contamination points from adjacent groundwater. The requirements are intended to reduce the risk of contamination. The permitting requirements under the Ordinance serve to protect the users of regulated substances as well as the wellfields.

The Ordinance also provides for operating permits, closure permits, permit conditions, bonds, cleanup and reimbursement, permit fees, revocation and revision of permits, hearings, appeals, exemptions, transfers, trade secrets, compensation for businesses which must close or move, enforcement, and penalties.

All proposed well sites and any new well sites being considered by the City of Boca Raton must take the Wellfield Protection Program and the Ordinance's requirements into consideration. Care must be taken to avoid areas of zoning and land use that permit the use of regulated contaminants.

South Florida Water Management District (SFWMD)

Consideration must also be given to all applicable laws, rules, regulations, and policies of the SFWMD in the formulation and implementation of water supply improvements in the Boca Raton service area. Withdrawals of groundwater or the use of surface water for potable water supply, irrigation, or industrial purposes is regulated by consumptive use permits that must be obtained from the SFWMD. The District also issues permits for construction of water supply wells.

The SFWMD, when issuing water use permits, normally attaches general and specific permit conditions requiring certain actions on the part of the applicant. These may include requirements for additional water conservation measures or long-term water supply planning, or may be related to specific characteristics of the wellfield. In coastal areas, such conditions may require groundwater monitoring to address the possibility of saltwater encroachment. The District also requires proof that well locations are consistent with local or state wellfield protection programs.

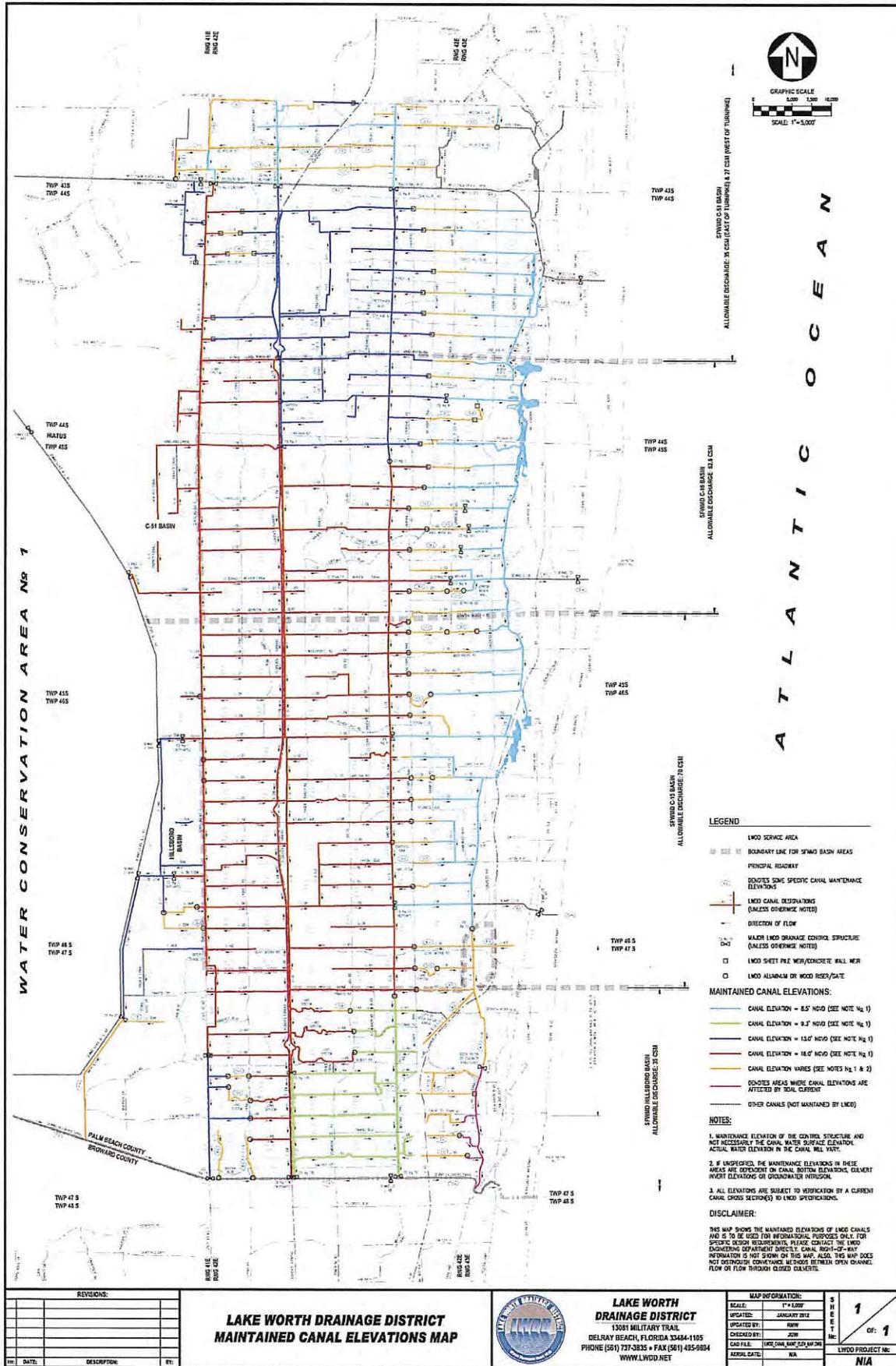
On May 27, 1986, the City Council adopted Ordinance No. 3527 (see Appendix C) which adopted the rules of the SFWMD, Chapter 40E-21, Florida Administrative Code, which is the SFWMD's Water Shortage Plan.

In February of 2007, the SFWMD Governing Board adopted a Regional Availability Rule that restricted the allocation of water from the Biscayne Aquifer for consumptive uses. This rule directly impacted the City of Boca Raton during the consumptive use permit renewal

process. Ultimately, the City of Boca Raton was granted a 20-year Consumptive Use Permit #50-00367-W, on July 10, 2008 with the allocation amount of 18,811 million gallons per year. The increase in allocation needed for growth was granted on the basis that the expansion of the City's In-City Reclamation Irrigation System (IRIS) would offset any increase in withdrawals.

Lake Worth Drainage District (LWDD)

The LWDD is responsible for drainage and surface water control throughout southeastern Palm Beach County, from Okeechobee Boulevard to the north, to the Hillsboro Canal and the Palm Beach County/Broward County line to the south. That portion of the City of Boca Raton located generally west of the El Rio Canal lies within the LWDD boundaries. The following map shows the general locations of some of the canal recharge facilities which are operated by the LWDD.



NO.	DATE	DESCRIPTION	BY

**LAKE WORTH DRAINAGE DISTRICT
MAINTAINED CANAL ELEVATIONS MAP**



**LAKE WORTH
DRAINAGE DISTRICT**
13051 MILITARY TRAIL
DELRAY BEACH, FLORIDA 33484-1105
PHONE (561) 737-3835 • FAX (561) 455-9884
WWW.LWDD.NET

MAP INFORMATION:		SHEET NO.	OF
SCALE:	1" = 3,000'		
UPDATED:	JANUARY 2012		
DESIGNED BY:	BNW		
CHECKED BY:	ZCW		
DATE FILED:	DEC 10, 2011		
APPROVAL DATE:	NA		
LWDD PROJECT NO.:		NIA	

With regard to water supply and wellfield location, the LWDD staff is requested by the SFWMD to review and comment on all applications for SFWMD water use permits for wells or wellfields lying within LWDD boundaries. The SFWMD also requests LWDD involvement prior to the permitting of any surface water allocations for use in aquifer recharge or agricultural or industrial activities. While an approval or objection that is filed by the LWDD on a SFWMD water use or surface water allocation permit may, or may not, result in like action by the SFWMD, the latter agency usually evaluates LWDD input in developing the SFWMD final permitting position.

Summary

The most important aspects of regulatory agency constraints on future water service by the City of Boca Raton Utility Services are:

- A. Impacts of the Wellfield Protection Program Ordinance on existing and proposed water supply wells.
- B. Requirements of the SFWMD for increased raw water withdrawals and associated water use permit conditions.
- C. Concerns of the LWDD about their ability to maintain adequate water levels in the drainage canal network that recharges various existing and proposed wellfields in the southern part of the County, including those of the City.

2.0 BACKGROUND INFORMATION

2.1 Overview

The meaning of the name Boca Raton has always aroused curiosity. Many people wrongly assume the name is simply Rat's Mouth. The Spanish word boca (or mouth) often described an inlet, while raton (literally mouse) was used as a term for a cowardly thief. But the "Thieves Inlet," Boca Raton, appeared on eighteenth century maps associated with an inlet in the Biscayne Bay area of Miami. By the beginning of the nineteenth century, the term was mistakenly applied to Lake Boca Raton, whose inlet was closed at the time. The "s" and later the "e" were dropped from this title by the 1920s, yet the correct pronunciation remains Rah-tone.

The earliest known inhabitants of the Boca Raton area were the Tequesta Indians, who lived in communities near the ocean as long ago as one thousand years until the eighteenth century. The construction of the Florida East Coast Canal (today's Intracoastal) and the Florida East Coast Railway in the 1890s made the region accessible to a group of resourceful pioneers. By the early 1900s Boca Raton was a tiny agricultural community, many of the farmers specializing in pineapple cultivation. Amongst these were a group of Japanese immigrants under the leadership of Joseph Sakai, who formed a community along today's Yamato Road in 1904.

In May of 1925, the Town of Boca Raton was incorporated at the height of the Florida land boom. The town council commissioned noted society architect Addison Mizner to plan a world-class resort community. His exclusive hotel, known as the Cloister Inn, was completed in 1926 and continues its reign as a city landmark as the Boca Raton Resort and Club. Although many of Mizner's plans for the young community were squelched by the demise of the land boom in 1926, a few survive today—and his architectural style continues to influence the city.

One of Mizner's projects was a design for a city hall for Boca Raton. Completed by Delray architect William Alsmeyer in 1927, Old Town Hall at 71 North Federal Highway still bears the original footprint of the Mizner design, and was constructed using ironwork, tile, and woodwork supplied by Mizner Industries. Today the restored Town Hall is the home of the Boca Raton Historical Society.

In the 1930s and 40s, Boca was known for its winter vegetable crop, particularly the green beans which commanded a premium in northern markets. In 1942, the Army Air Corps established its only war-time radar training school at the site of what is today F.A.U. and the Boca Raton Airport. The facility brought over 30,000 servicemen as well as families and civilian employees to the tiny community of Boca Raton, with a population of 723 in 1940.

In the 1950s, the still small town played host to a safari park called Africa USA which opened where the Camino Gardens development stands now. E. G. Barnhill offered an attraction called Ancient America on the site of prehistoric burial mounds on U.S. 1 in the area of today's Sanctuary neighborhood. The Winter Bible Conference Grounds—Bibletown—was established in buildings of the former Air Field.

In the 1960s, South Florida experienced another great land boom, with developments pushing the Everglades and former farmlands increasingly westward. The population grew to almost 30,000 residents by 1970, continuing to increase well outside city limits to this day. In 1962, Boca Raton attracted the newest state university, Florida Atlantic, to the site of the old army airbase. IBM moved one of its computer facilities to Boca Raton in 1967, and in 1981, it was there the first IBM PC, or personal computer, was developed.

During the 1980s and 1990s, the City focused much of its attention on downtown redevelopment, and a number of important historical properties, such as Boca Raton's original Town Hall and F.E.C. Railway Station were restored and opened to the public. Many fine cultural facilities, such as the Boca Raton Museum of Art, have grown up to meet the needs of the growing population.

Since Boca Raton was incorporated as a town in 1925, the City has experienced steady and substantial growth. As of 2010, the City had a population of 84,392. Boca Raton is the 24th most populous city in the State of Florida, and the second largest city in Palm Beach County.

Geographically the City encompasses 29.6 square miles (18,572 acres). The City has five miles of ocean frontage and the park system covers approximately 1,080 acres. The last piece of available vacant beachfront property was purchased in 1994. This acquisition of

the Ocean Strand parcel by the Greater Boca Raton Beach Tax District completed the purchase of more than five miles of publicly owned beachfront property.

Located along Florida's "Gold Coast", Boca Raton is the southernmost municipality in Palm Beach County. The City is located approximately 40 miles north of Miami, midway between the cities of West Palm Beach to the north and Fort Lauderdale to the south. The City is bordered on the north by the Town of Highland Beach, the City of Delray Beach, and unincorporated Palm Beach County; on the west by unincorporated Palm Beach County; on the south by the City of Deerfield Beach in Broward County; and on the east by the Atlantic Ocean.

Boca Raton, along with Martin, St. Lucie, and Indian River Counties, are under the jurisdiction of the Treasure Coast Regional Planning Council. Deerfield Beach, Broward County, and all local governments to the south of Boca Raton are under the jurisdiction of the South Florida Regional Planning Council.

The City provides police services, fire-rescue services, municipal services (sanitation, roads, storm water, and traffic control), recreation services (parks, beaches, golf courses, tennis courts, libraries and swimming pools), and utility services (water, wastewater, and reclaimed water). Boca Raton is known nationally and internationally as an originator in the area of comprehensive zoning. Both the low density, i.e. dwelling units per acre, character of the City and the innovative Park of Commerce Industrial Park have influenced development around the country. The sign code, which was initiated in the late 1960s, gives the City a unique look with minimal commercial intrusion into landscaping and streetscapes.

The City is enjoying the results of the economic expansion of the 1990s. After weathering the economic storms of the 1980s and the loss of a major employer, the City has seen a steady increase in its industrial base. Boca Raton has become a Mecca for innovative computer development, using a well-educated, computer literate community as its base. Because of its initiative, the City has reaped the benefits of effective land use planning -- a stable tax base with increasing property values.

2.2 Relevant Regional Issues

As the state agency responsible for water supply in the Lower East Coast planning area, the SFWMD plays a pivotal role in resource protection, through criteria used for consumptive use permitting. As pressure increased on the Everglades ecosystem resource, the Governing Board initiated rule making to limit increased allocations dependent on the Everglades system. As a result, the Regional Water Availability Rule was adopted by the Governing Board on February 15, 2007 as part of the SFWMD's water use permit program. This reduced reliance on the regional system for future water supply needs, mandates the development of alternative water supplies, and increasing conservation and reuse.

3.0 DATA AND ANALYSIS

3.1 Population Information

The City of Boca Raton's existing and future population figures have been provided by the City's Planning and Zoning Division. In 2008, the population in the City of Boca Raton comprised of 85,293 permanent residents. In 2010, the City completed Evaluation and Appraisal Report (EAR) based amendments of the City's Comprehensive Plan. Population projections contained in that document are listed in Table 1. Additional population figures for the City are contained in Table 2. These figures were updated in 2009 and used in the 2010 EAR-based amendments to the Comprehensive Plan. Because the City provides water and sewer services to portions of unincorporated Palm Beach County, populations for the Water and Sewer Service area were also calculated, these figures are listed in Table 3. As indicated in Table 2, by 2008 the population in the City of Boca Raton had increased to 85,293 permanent residents which is approximately a 26 percent increase in population since 1996. This increase in population includes the estimated population due to the annexations that occurred in 2003 and 2004. Based on the 2014 estimated population, the population is expected to increase 7.28% to 94,148 by 2034 for permanent residents.

TABLE 1
CITY OF BOCA RATON POPULATION PROJECTIONS
 (Page 24 of City's 2010 EAR-based Amendments)

Year	Resident	Seasonal and Tourist	Total
2008	85,293	14,871	100,164
2013	84,428	15,491	102,919
2020	90,684	16,130	106,814
2035	94,284	16,815	111,099

TABLE 2
CITY OF BOCA RATON POPULATION PROJECTIONS

Update: 5/29/2009

CITY OF BOCA RATON
POPULATION & UNIT PROJECTIONS
 (for 2004-2005 EAR Complan Amendment)

Year	Population				Units			
	Permanent	Seasonal	Tourist	Total	Permanent	Seasonal	Vacant	Total
2000	74,764	9,855	3,791	88,410	31,848	4,198	1,501	37,547
2008	85,293	10,594	4,277	100,164	37,317	4,568	1,708	43,593
2009	86,266	10,656	4,472	101,394	37,496	4,598	1,859	43,953
2010	86,715	10,715	4,472	101,902	37,721	4,628	1,720	44,069
2011	86,936	10,744	4,472	102,152	37,831	4,643	1,740	44,214
2012	87,182	10,776	4,682	102,640	37,954	4,659	1,746	44,359
2013	87,428	10,809	4,682	102,919	38,077	4,675	1,752	44,504
2014	87,763	10,853	4,682	103,298	38,245	4,697	1,812	44,754
2015	88,098	10,897	4,682	103,677	38,412	4,719	1,767	44,898
2016	88,527	10,954	4,682	104,163	38,627	4,747	1,886	45,260
2017	89,076	11,026	4,892	104,994	38,901	4,784	1,861	45,546
2018	89,668	11,104	4,892	105,664	39,197	4,823	1,938	45,958
2019	90,217	11,176	4,892	106,285	39,472	4,859	1,862	46,193
2020	90,684	11,238	4,892	106,814	39,706	4,890	1,914	46,510
2021	91,101	11,293	4,892	107,286	39,914	4,917	1,853	46,684
2022	91,537	11,350	5,102	107,989	40,132	4,946	1,946	47,024
2023	91,974	11,408	5,102	108,484	40,351	4,975	1,874	47,200
2024	92,271	11,447	5,102	108,820	40,499	4,994	1,881	47,374
2025	92,568	11,486	5,102	109,156	40,647	5,014	1,888	47,549
2026	92,865	11,525	5,102	109,492	40,796	5,033	1,895	47,724
2027	93,140	11,562	5,102	109,804	40,933	5,051	1,888	47,872
2028	93,334	11,587	5,102	110,023	41,030	5,064	1,858	47,952
2029	93,470	11,605	5,102	110,177	41,098	5,073	1,861	48,032
2030	93,605	11,623	5,102	110,330	41,166	5,082	1,865	48,113
2031	93,741	11,641	5,102	110,484	41,234	5,091	1,868	48,193
2032	93,877	11,659	5,102	110,638	41,302	5,100	1,871	48,273
2033	94,013	11,677	5,102	110,792	41,370	5,109	1,874	48,353
2034	94,148	11,695	5,102	110,945	41,438	5,118	1,877	48,433
2035	94,284	11,713	5,102	111,099	41,505	5,127	1,881	48,513

**TABLE 3
CITY OF BOCA RATON POPULATION PROJECTIONS
FOR WATER AND SEWER SERVICE AREA**

Update: 5/29/2009

**WATER & SEWER SERVICE AREA
POPULATION & UNIT PROJECTIONS
(for 2004-2005 EAR Complan Amendment)**

Year	←-----Population-----→				←-----Units-----→			
	Permanent	Seasonal	Tourist	Total	Permanent	Seasonal	Vacant	Total
2000	102,421	13,611	4,098	120,130	45,596	6,080	2,227	53,903
2008	107,739	14,335	4,277	126,351	48,122	6,461	2,246	56,829
2009	108,230	14,400	4,472	127,102	48,365	6,493	2,397	57,255
2010	108,702	14,462	4,472	127,636	48,600	6,524	2,258	57,382
2011	108,945	14,494	4,472	127,911	48,719	6,540	2,278	57,537
2012	109,213	14,530	4,682	128,425	48,851	6,558	2,285	57,694
2013	109,481	14,565	4,682	128,728	48,983	6,576	2,291	57,850
2014	109,838	14,613	4,682	129,133	49,160	6,600	2,352	58,112
2015	110,195	14,660	4,682	129,537	49,336	6,623	2,308	58,267
2016	110,646	14,720	4,682	130,048	49,560	6,653	2,426	58,639
2017	111,217	14,795	4,892	130,904	49,843	6,691	2,402	58,936
2018	111,831	14,876	4,892	131,599	50,148	6,731	2,479	59,358
2019	112,402	14,952	4,892	132,246	50,431	6,769	2,404	59,604
2020	112,891	15,016	4,892	132,799	50,674	6,801	2,456	59,931
2021	113,330	15,074	4,892	133,296	50,891	6,830	2,396	60,117
2022	113,788	15,135	5,102	134,025	51,119	6,861	2,489	60,469
2023	114,247	15,196	5,102	134,545	51,346	6,891	2,417	60,654
2024	114,566	15,238	5,102	134,906	51,504	6,912	2,425	60,841
2025	114,885	15,280	5,102	135,267	51,661	6,933	2,432	61,026
2026	115,204	15,322	5,102	135,628	51,819	6,955	2,440	61,214
2027	115,501	15,362	5,102	135,965	51,965	6,974	2,434	61,373
2028	115,706	15,387	5,102	136,195	52,067	6,988	2,398	61,453
2029	115,842	15,405	5,102	136,349	52,135	6,997	2,401	61,533
2030	115,977	15,423	5,102	136,502	52,203	7,006	2,405	61,614
2031	116,113	15,441	5,102	136,656	52,271	7,015	2,408	61,694
2032	116,249	15,459	5,102	136,810	52,338	7,024	2,411	61,773
2033	116,385	15,477	5,102	136,964	52,406	7,032	2,414	61,852
2034	116,520	15,495	5,102	137,117	52,474	7,041	2,417	61,932
2035	116,656	15,512	5,102	137,270	52,542	7,050	2,421	62,013

The City of Boca Raton Utility Services Department serves portions of unincorporated Palm Beach County. Since approximately 20% of the total service area potable water demand comes from the unincorporated areas, it is important that certain activities in the "overlap" area be coordinated. Both the City and Palm Beach County have projected populations for the unincorporated areas that receive water services from the City. Table 5 describes the population projections contained in Palm Beach County's 2008 20-Year Water Supply Plan which were updated in 2010.

Table 5 – Palm Beach County Population Projections

UTILITY	2010 Rev		2015		2020		2025	
	TOTAL POP SERVED	UNINCORP. POP SERVED						
BOCA	107,054	22,662	110,237	22,932	115,236	23,557	118,223	23,817
BOYNTON BEACH	102,990	31,815	107,753	32,761	114,375	34,599	119,700	36,066
DELRAY BEACH	63,999	2,593	67,245	2,892	70,583	3,201	75,051	3,529
GOLF	2,755	2,503	2,797	2,537	2,816	2,550	2,858	2,588
HIGHLAND BEACH	3,631		3,832		3,917		4,075	
JUPITER	70,749	13,517	72,763	12,485	77,641	14,766	84,297	20,139
LAKE REGION AREA	34,248	6,256						
SOUTH SHORE	264	264	328	328	337	337	388	388
LAKE WORTH	45,510	10,600	47,285	10,866	48,639	11,157	50,491	11,441
LANTANA	10,380		10,508		10,613		10,821	
MAGONIA	1,888		1,931		2,156		2,503	
MANALAPAN	2,421		2,450		2,480		2,522	
PALM SPRINGS	45,380	24,313	47,093	23,791	50,092	26,313	54,829	30,529
RIVIERA BEACH	37,787	2,939	39,745	3,029	41,915	3,111	44,533	3,225
ROYAL PALM								
SEACOAST	87,744	17,927	90,853	18,850	96,764	19,239	100,816	19,816
SEMINOLE			195	195	1,120	1,120	4,336	4,336
TEQUESTA	8,222	2,176	8,671	2,199	8,840	2,228	9,030	2,264
WELLINGTON	55,741	3,346	58,315	3,463	61,531	4,442	63,683	4,937
WEST PALM BEACH	108,611	783	113,684	258	121,614	259	128,767	262
PBCWUD*	458,839	377,427	533,253	421,231	584,940	466,669	629,617	505,282
SELF-SERVED (ON WELLS)**	71,922	68,396	58,263	53,636	49,693	46,438	39,463	36,811
TOTAL PROJECTED POPULATION	1,320,134	587,515	1,377,200	611,474	1,465,300	659,985	1,546,000	668,620
BEBR COUNTY POPULATION	1,320,134		1,377,200		1,465,300		1,546,000	

*PBCWUD includes Greenacres; Haverhill, part of Wellington on east side of SR7, Glen Ridge, Cloud Lake, Atlantis, part of Palm Springs, part of West Palm Beach, and Royal Palm east of SR7.

**Self-Served Population includes part of Glades Area, parts within the South & Central Regions of WUD Service Area, Jupiter Farms, Acreage, Loxahatchee Groves, all unrecorded subdivisions in the former Sector Plan, Sections of the Ag Reserve west of SR7, and Seminole. Information was obtained from the PBCWUD Special Assessment Program.

Source: PZ&B 2013 Population Allocation Model. The 2020 & 2025 are projected population based on the housing units expected to be built according to historical trends and adopted plans.

Note: As BEBR published their latest population projection in March 2008, the 2007 Allocation Model results were modified to reflect the slower short term growth of the County for 2010 and 2015.

Table 6 provides a comparison of the unincorporated area population projections as relating to both the City's 2005 EAR Water and Sewer Service Area populations (updated 2009 - Table 3) and Palm Beach County's population projections (Table 5).

TABLE 6
Population Projections for Unincorporated Service Area

Year	City 2005 EAR Projections Updated in 2009	County Projections
2010	21,987	22,662
2015	22,097	22,932
2020	22,207	23,557
2025	22,317	23,817
2030	22,372	N/A
2035	22,372	N/A

Since the projections differ by less than 10%, the comparison between the unincorporated area projections is considered consistent.

3.2 Maps of Current and Future Areas Served

The map depicting current and future City boundaries served by the City of Boca Raton Utility Services Department are provided in Figure 1.

Figure 1 – City of Boca Raton Utility Services Service Area



The City of Boca Raton owns and operates facilities to withdraw, treat, store and distribute potable water. The service area consists of 35 square miles and includes residential, commercial, hotel/motel and institutional uses, as well as some contiguous areas within unincorporated Palm Beach County. In 2013, the Department distributed an average of 31 mgd treated water to a population of 128,728 yielding a daily use of 241 gallons per capita per day (gpcpd). Projected population growth through 2035 affords 334.3 gallons gpcpd finished water demand Level of Service (LOS). The Department has a design storage capacity of approximately 25.5 MG equivalent to 198 gpcpd storage LOS when using the 2013 population estimates. The Department provides a water pressure LOS of 60 pounds per square inch (psi) in normal conditions and a minimum water pressure LOS of 20 psi under mechanical or drought conditions.

The City's large potable water users (in no particular order) include: Boca Raton Regional Hospital, Boca Raton Resort and Club, Florida Atlantic University, Boca Technology Center, and Town Center Mall.

The sole source of the raw water is the Biscayne Aquifer. The aquifer is recharged by local rainfall and supplemented by water diversions controlled by the South Florida Water Management District (SFWMD), including Lake Okeechobee, Water Conservation Area No. 1, Hillsboro Canal and Lake Worth Drainage District (LWDD) canals E-2-E, E-3 and E-4 and various lateral canals. Fifty-one wells withdraw water from depths of 110 to 120 feet. The water is transmitted to the Boca Raton treatment plant located on Glades Road just east of Interstate-95. The water is treated in either the lime softening plant (30 mgd capacity) or the membrane softening plant (40 mgd capacity). The water produced in each plant is blended before being pumped into the water distribution system. The water distribution system includes: 25.32 million gallons (MG) of finished water storage capacity; 585 miles of pipe; ~5,600 fire hydrants; and ~35,000 water meters.

The current 2034 projected population of 137,117 will require an average daily raw water demand of 51.69 mgd to produce 43.94 mgd potable water. The installed wellfield capacity for the City of Boca Raton Utility Services Department (CBRUSD) is approximately 86.3 MGD with a permitted maximum month withdrawal of 57.90 MGD. Water treatment facilities to be utilized in the 2034 condition will be a 2:1 blend of lime-softening treatment and membrane-softening treatment. The 2013 annual demand on the City's wellfields was 13.797021 billion gallons and the projected 2034 annual demand is 18.87 billion gallons. Utilizing a 1:10 year drought demand (assuming 10% higher than average-day demand) the CBRUSD will have a surplus of more than 29.4 mgd raw water pumping capacity and more than 13.1 mgd treatment capacity.

Pursuant to Consumptive Use Permit No. 50-00367-W, the City of Boca Raton has a maximum annual allocation of 18.811 billion gallons and a maximum monthly allocation of 1760.02 million gallons.

The City is committed to meeting all existing and future customer demands for water quality and quantity, in an economical and efficient manner.

The CBRUSD has realized the necessity of aggressive water conservation and the use of alternative water sources as part of their strategy to meet current and projected potable water needs. The CBRUSD's updated CIP is designed to have a surplus condition for both raw and finished water facilities throughout the 20-year planning period and beyond.

Between 2000 and 2005, a total of \$66,000,000.00 was spent on the capital improvement project of constructing the 40 mgd membrane-softening facility. This project added 40 mgd plant production capacity and can provide services to an anticipated population of 137,270 in 2035.

The CBRUSD IRIS reclaimed water system provides approximately 7.0 to 8.0 mgd of reclaimed water to approximately 1,200 customers. Expansion of the IRIS system during 2010 reduced the dependability of groundwater for customers west of I-95. The additional reclaimed water projects below totaling ~\$20 M were completed by 2014:

- Expansion of the on-site plant production capacity from 10 mgd to 17.5 mgd
 - \$4,340,300.00
 - Completed in August 2010

- Expansion of the reclaimed water distribution system:
 - Broken Sound East Golf Course Phase I and Patch Reef Park (~0.9 mgd)
 - \$1,054,044.95
 - Completed in 2009
 - Broken Sound West Golf Course Phase II (~0.9 mgd)
 - Completed in 2011
 - Woodfield Country Club Golf Course (~1.0 mgd)
 - Completed in 2011
 - Boca West Golf Course and Common Areas (~3.0 mgd)
 - Connection completed; usage to begin in FY 2015

- Construction of an off-site 5.0 MG Reclaimed Water Storage Tank
 - \$3,914,909.00
 - Completed in 2010

- Several smaller distribution system expansions resulting in the reuse of 100% available effluent (on annual average) completed in 2013.

- Membrane concentrate blending with reclaimed water project
 - \$651,896.00
 - Completed in 2014

Historically, utilizing only the lime softening treatment process, the CBRUSD has operated with a raw water per capita usage of 332 gallons per capita per day (gpd) and finished water per capita usage of 316 gpd. Since the construction of the membrane softening plant, the department now operates with a 2:1 membrane:lime water treatment process ratio.

(a) The adopted level of service for potable water is:

Treatment	Raw water use expected	Recovery	Net Finished water produced
Lime	6270	.95	5956.5
Membrane	12541	.85	10659.85
Total	18811		16616.35

- (i) The 2034 population projection of 137,117 requires a 334.3 gallons per capita LOS (service area wide) finished water demand.
- (ii) Water storage facilities design of 215 gallons per capita.
- (iii) Water pressure of 60 psi leaving the plant under normal conditions, and a minimum of 20 psi in the distribution system under drought conditions.

(b) Per-unit water demands for the City of Boca Raton used in land-use amendment planning include:

- (i) Single Family = 382.03 gpd x 2.3 persons per unit
- (ii) Multi Family = 150 gpd x 2.3 persons per unit
- (iii) Industrial = 0.3555 gpd/sqft
- (iv) Commercial = 0.355 gpd/sqft
- (v) Hotel = 86.25 gpd/room
- (vi) Institutional = 0.20 gpd/sqft

3.4 Population and Potable Water Demand Projections by the City of Boca Raton Utility Services

Year	Projections	2008 CUP Allocation = 18,811 MGY		Water Treatment Plants (70 mgd treatment capacity; 334.4 gpcpd permitted LOS)	Water Supply Wells (87 mgd production capacity)	Water Storage Tanks (25.5 mgd storage capacity)
		Annual Demand MG	Annual Surplus MG	Surplus	Surplus	Surplus
2005	125,623	15,585	N/A	28.00	45.00	-1.51
2010	127,636	17,828	N/A	27.33	44.33	-1.94
2015	129,537	17,837	973	26.70	43.70	-2.35
2020	132,799	18,436	374	25.61	42.61	-3.05
2025	135,267	18,626	185	24.78	41.78	-3.58
2035	137,270	18,834	N/A	24.11	41.11	-4.01

3.4a Population and Potable Water Demand Projections by the City of Boca Raton Utility Services – 2006 Consumptive Use Permit Renewal

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Service Area Boca Raton:RW(1)

Treatment Plant (Table I) Boca Raton WTP

**TABLE F
Past Water Use**

Year	Past Population*	Per Capita Usage	Total Annual Use (MG)	Average Month Use (MG)	Maximum Month Use (MG)	Ratio Max:Average
2000	113,905	388	16,142.23	1,345.18	1,637.42	1.22
2001	114,252	296	12,353.91	1,029.49	1,180.8	1.15
2002	114,599	347	14,531.9	1,210.99	1,450.1	1.20
2003	115,239	345	14,532.44	1,211.04	1,301.28	1.07
2004	124,827	335	15,201.47	1,266.79	1,428.93	1.13
2005	125,846	339	15,585.8	1,298.75	1,468.32	1.13
		5 yr. average = 332.4				
		15% system loss = 382.26				3 yr. average = 1.11

* Source of Projected Population Information: Tables F: Extrapolated from City of Boca Raton 2005 EAR projected population (page 14) adjusted by adding 19,000 to reflect customers outside city limits.

**TABLE G
Projected Water Use**

Year	Projected Population*	Per Capita Usage	Total Annual Use (MG)	Average Month Use (MG)	Maximum Month Use (MG)	Ratio Max:Average
2006	126,351	382.26	17,629.11	1,469.09	1,630.69	1.11
2007	127,336	382.26	17,770.73	1,480.89	1,643.79	1.11
2008	128,107	382.26	17,923.08	1,493.59	1,657.89	1.11
2009	128,517	377.26	17,698.78	1,474.73	1,636.95	1.11
2010	129,472	377.26	17,828.28	1,485.69	1,649.12	1.11
2011	130,082	377.26	17,912.28	1,492.69	1,656.89	1.11
2012	130,520	377.26	18,021.83	1,501.82	1,667.02	1.11
2013	131,017	377.26	18,041.03	1,503.42	1,668.80	1.11
2014	131,378	377.26	18,060.74	1,507.56	1,673.39	1.11
2015	131,892	377.26	18,161.52	1,513.46	1,679.94	1.11

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Form 0645-G89 (08/03)

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Service Area Boca Raton:RW(2)

Treatment Plant (Table I) Boca RatonWTP

**TABLE F
Past Water Use**

Year	Past Population*	Per Capita Usage	Total Annual Use (MG)	Average Month Use (MG)	Maximum Month Use (MG)	Ratio Max:Average

* Source of Projected Population Information: Table G: City of Boca Raton Water and Sewer Service Area Population and Unit Projections for 2004-2005 EAR Report

**TABLE G
Projected Water Use**

Year	Projected Population*	Per Capita Usage	Total Annual Use (MG)	Average Month Use (MG)	Maximum Month Use (MG)	Ratio Max:Average
2016	132,425	377.26	18,284.87	1,523.74	1,691.35	1.11
2017	133,017	377.26	18,316.43	1,526.37	1,694.27	1.11
2018	133,435	377.26	18,373.99	1,531.17	1,699.59	1.11
2019	133,854	377.26	18,431.68	1,535.97	1,704.93	1.11
2020	134,483	377.26	18,569.03	1,547.42	1,717.64	1.11
2021	134,902	377.26	18,575.99	1,548.00	1,718.28	1.11
2022	135,320	377.26	18,633.55	1,552.80	1,723.60	1.11
2023	135,739	377.26	18,691.25	1,557.60	1,728.94	1.11
2024	136,157	377.26	18,800.17	1,566.68	1,739.02	1.11
2025	136,609	377.26	18,811.05	1,567.59	1,740.02	1.11

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Form 0645-G89 (08/03)

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Service Area Boca Raton:RW(2)

Treatment Plant (Table I) Boca RatonWTP

**TABLE F
Past Water Use**

Year	Past Population*	Per Capita Usage	Total Annual Use (MG)	Average Month Use (MG)	Maximum Month Use (MG)	Ratio Max:Average

* Source of Projected Population Information: Table G: City of Boca Raton Water and Sewer Service Area Population and Unit Projections for 2004-2005 EAR Report

**TABLE G
Projected Water Use**

Year	Projected Population*	Per Capita Usage	Total Annual Use (MG)	Average Month Use (MG)	Maximum Month Use (MG)	Ratio Max:Average
2026	136,854	375.55	18,811.05	1,567.59	1,760.02	1.11
2027	137,100	375.91	18,811.05	1,567.59	1,760.02	1.11

sfwmd.gov

Form 0645-G69 (08/03)

3.5 Water Supply Provided by Local Government

Consumptive Use Permit (CUP) Information

- ***Current CUP Number***

50-00367-W

- ***Raw Water Allocation Information***

- ***Average Annual Daily and Maximum Monthly (Daily) Allocations***

Annual Allocation: 18,811 Million Gallons

Maximum Monthly Allocation: 1,760 Million Gallons

- ***Applicable Source Limitations (dry season, wellfields, and priority)***

N/A

- ***Required Off-sets:***

2.93 Million Gallons per Day

1,068.34 Million Gallons per Year

- ***Expiration Date(s) by Source***

Biscayne Aquifer: July 10, 2028

- ***Treatment Facilities and Planning Schedules***

Raw Water Supply

Raw Water Supply

The City's raw water is provided by six wellfields, known the Central, Northern, Northwest, Northeast, Southwest and Southeast wellfields. Three additional wells were recently completed near the Northwest Wellfield. All of the wells in Boca Raton are telemetry controlled and withdraw water from the Biscayne aquifer, which is the source for most potable water supplies in southeast Florida. The aquifer lies from 0 to 300 feet below the ground surface and underlies the entire Boca Raton area. All wellfields are located within the City's service area. The wells are regularly serviced and pumped periodically to ensure operability and to determine if there is any bacterial contamination in the wells.

Central Wellfield

The Central Wellfield is comprised of one (1) well, known as 12W, and is located on the south side of Glades Road, directly across from the Glades Road Water

Treatment Plant (WTP) located at 1301 Glades Road. Well 12W is rated for 1400 gpm which is a total capacity of 2 mgd.

Northeast Wellfield

The Northeast (NE) Wellfield is comprised of ten (10) operating wells, designated 13-E through 22-E and is oriented south to north along Northwest Fifth Avenue and the El Rio Canal (E-4) from NW 20th Street to just north of NW 40th Street (Spanish River Boulevard).

The wells are all rated for 700 gpm (1 mgd) for a total capacity of 10 mgd.

Southeast Wellfield

The Southeast (SE) Wellfield is comprised of five (5) operating wells, designated 3E, 4E, 12E, 24E and 25E. 3E and 4E are located along NW 2nd Ave, between NW 6th St and Glades Road, each rated for 700 gpm (1 mgd). Wells 12E, 24E and 25E are located along NW 4 Ave between Glades Road and just north of NW 20th St. 12E is rated for 700 gpm (1 mgd) and 24E and 25E are each rated for 1400 gpm (2 mgd). The total capacity of the SE Wellfield is 7 mgd.

Both the NE and SE wellfields are connected through a 36-inch diameter raw water transmission main to the WTP.

Southwestern Wellfield

The Southwestern (SW) Wellfield has twelve (12) wells, designed 1W through 9W and 40W through 42W. The last 3 wells (40-42W) were constructed along West Palmetto Park Road in 1990s. Wells 1W through 9W were constructed along the E-3 Canal, which is oriented north to south from Glades Road to Camino Real. These wells pump raw water through a 48-inch diameter transmission main to the Glades Road Plant. The total capacity of the SW wellfield is 24 mgd.

Northwest Wellfield

The Northwest (NW) Wellfield has thirteen (13) production wells, designated 13W through 25W. Wells 13W through 15W are oriented from southwest to northeast in the median of Potomac Road; wells 16W through 20W are oriented from south to north along the E-3 Canal; wells 25W, 24W, 20W through 23W are oriented from east to west; respectively, along Yamato Road. Each well has a rated capacity of 2.0 MGD or 1,400 GPM for a total capacity of 26 mgd. (26W was part of this wellfield but was abandoned and sealed in 2013.)

The Yamato Road generator building next to Well 20W was provided to supply emergency power to wells 17W through 25W in the NW Wellfield, along with housing the motor control centers for these wells. This station includes a telephone communication line connected directly to the operations control room at the WTP.

Northern Wellfield

The Northern (N) Wellfield has eight (8) production wells, designated as 27W, 29W, 30W, 32W, and 35W through 37W. The wells were constructed in the

Broken Sound area in June 1991. This wellfield has an installed capacity of 16 MGD with each well rated at 2.0 MGD or 1,400 GPM.

The N and NW wellfields pump raw water to the WTP through a 48-inch diameter transmission main.

New Wells

In order to further ensure that the potential for salt water intrusion would be reduced, and to replace wells that were abandoned and sealed in the NE and SE Wellfields, the City constructed three new western wells located along Military Trail, just south of Spanish River Boulevard. Each well has an installed capacity of 2.0 MGD or 1,400 GPM for a total of 6 mgd. These wells were placed in service in 2014.

Total Wellfield Capacity

The total rated capacity of all six wellfields is 63,700 gpm (91 mgd). Historically, the City has experienced approximately 70 mgd production capacity reliability (77%) from the wellfields which includes an accounting for wells that are temporarily out-of-service or periodically taken out-of-service for rehabilitation. The City also maintains an industry below average measured difference between the sums of total metered volume pumped at the individual wells vs. the volume of raw water measured as received on the treatment plant master meters of less than one percent. The average daily raw water flow metered at the WTP for calendar year 2013 was 37.8 mgd.

Treatment Facilities

The City of Boca Raton owns and operates water treatment facilities located on Glades Road just east of Interstate 95. The water treatment facilities include:

30 MGD Lime Softening Plant

The original 20 MGD nominal capacity plant that was completed in 1973 was upgraded to 60 MGD in 1983 by the construction of three dual-media filters, two softening units, three high-service pumps, a 7.5 MG storage tank, a sludge handling system, and modifications to the chemical feed system. Interim improvements completed in FY 89/90 allowed the plant to be rerated to 70 mgd. The plant utilizes ammonia injection to form a combined chlorine residual (chloramines) to reduce disinfection by-products. A SCADA system is used for operational control and to monitor the status of the plant and wellfields. In 2006, due to the additional capacity created by the completion of the Membrane Softening Plant, four dual-media filters and one lime-softening unit were disbanded resulting in a current lime softening plant rating of 30 mgd.

40 MGD Membrane Softening Plant

A state-of-the-art Membrane Softening Plant was constructed and completed in January 2005. It is typically operated at an 82% recovery rate. This facility includes:

- 6 raw water booster pumps;
- 4 (8-cells) multimedia pressure filters;
- 12 5-micron cartridge filters;
- 10 primary membrane feed pumps;
- 2 convertible membrane unit feed pumps;
- 10 primary membrane process units;
- 2 convertible membrane process units;
- 6 degasifiers; and
- 2 air quality control scrubbers.

Two-thirds of the raw water is directed to the Membrane Softening Plant and one-third is directed to the Lime Softening Plant for treatment. After softening treatment, the water is pH adjusted with sodium hydroxide or carbon dioxide, stabilized with corrosion inhibitor and disinfected with sodium hypochlorite in clearwells, followed by ammonia injection, then pumped to ground storage and distributed to the customers of Boca Raton. The WTP has been approved as meeting four-log virus reduction for disinfection. The average daily finish water flow for calendar year 2013 was 31.3 mgd.

With a combined capacity of 70 mgd and a projected demand of 51.69 mgd yielding an excess capacity of nearly 20 mgd, the City of Boca Raton Utility Services department has no long term plans for increasing the capacity of either water treatment facility. Facility maintenance and upgrades will be scheduled in accordance with standard preventative and predictive maintenance programs and as necessitated by regulation.

Transmission and Distribution System

The water transmission system is considered to be those water mains 10 inches in diameter and larger. Transmission mains are predominantly of cast iron and ductile iron construction. The system has a looped grid configuration which enhances system pressures and reliability. City Ordinance No. 3853 was adopted June 13, 1989, requiring connection to the potable water system for any building connected to the sanitary sewer system.

The water distribution system consists of mains eight inches or smaller in diameter, customer service lines, meters, hydrants, and other system appurtenances.

- ***Methods and Treatment Losses in the CUP***

The Lime Softening treatment process yields almost 100% of the raw water treated where as the Membrane Softening treatment process has an 85% treatment efficiency. The 15% loss due to the Membrane Softening process is

accounted for in the CUP utilizing a 2:1 blend of membrane softened and lime softened water treatment ratio.

- **Permitted Florida Department of Environmental Protection (FDEP) Capacities**

DEP DISTRICT	COUNTY	PWS ID	TYPE	DESIGN CAPACITY	# PLANTS	LAST DATE INSPECTED
4	50	4500130	COMMUNITY	70,000,000	1	05/2015

- **Storage Facilities**

The water storage facilities for Boca Raton are 24.72 MG in ground storage and 0.6 MG in elevated storage.

Storage Type	Number	Capacity	Location
Ground Storage Tank	1	10.0 MG	Glades Road & I-95 (Utility Complex)
Ground Storage Tank	1	7.5 MG	Glades Road & I-95 (Utility Complex)
Clearwell	3	1.72 MG	Glades Road & I-95 (Utility Complex)
Elevated Storage Tank	1	300,000 MG	Glades Road & I-95 (Utility Complex)
Elevated Storage Tank	1	300,000 MG	Glades Road & I-95 (Utility Complex)
Ground Storage Tank	1	3.0 MG	S.W. 18 th Street
Ground Storage Tank	1	1.5 MG	NW 2 nd Avenue
Ground Storage Tank	1	1.0 MG	Hidden Valley

Total Finished Water Storage Capacity	25.32 MG
--	-----------------

The Glades Road Water Treatment Plant has 19.22 MG of ground storage and 0.6 MG in the elevated backwash storage tanks onsite. These two on-site elevated tanks are not considered available except under extreme emergency. The facilities at the City's old Second Avenue Plant include 1.5 MG in ground storage. In May 1986, provisions were made to utilize a portion of the Second Avenue Plant storage and high-service pumping facilities to supplement the Glades Road high-service pumps. The Hidden Valley Pump Station has 1.0 MG in ground storage located onsite. A third storage tank located on S.W. 18th Street has 3.0 MG in storage capacity.

The Hidden Valley Pumping Station is operated on a time basis up to twice per day during peak demand periods. This pumping station is equipped with a diesel-powered generator for emergency power.

- ***Interlocal agreements and bulk sales***

N/A

- ***Interconnects, Distribution and Associated Responsibilities (emergency or on-going)***

All interconnections with neighboring Utilities are governed by interlocal agreements and serve for emergency purposes only. Listing of interconnects is provided in the following Table K.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

**TABLE K
Water Supply System Interconnections**

Interconnect with:	Location Description (also, please provide a location map)	Existing/ Proposed	Size	Capacity	Metered?	Status
Delray Beach	North City Limits (C-15) & Dixie Hwy. (Hidden Valley)	Existing	8 inch	627 gpm	Yes	Yes
Please discuss any operational constraints that would inhibit use of the interconnect: Primarily for emergency use only. Valves must be opened.						

Interconnect with:	Location Description (also, please provide a location map)	Existing/ Proposed	Size	Capacity	Metered?	Status
Delray Beach	North City Limits (C-15) & North Congress Avenue	Existing	8 inch	627 gpm	Yes	Yes
Please discuss any operational constraints that would inhibit use of the interconnect: Primarily for emergency use only. Valves must be opened.						

Interconnect with:	Location Description (also, please provide a location map)	Existing/ Proposed	Size	Capacity	Metered?	Status
Palm Beach County	Jog Road & Canary Palm Drive	Existing	8 inch	627 gpm	Yes	Yes
Please discuss any operational constraints that would inhibit use of the interconnect: Primarily for emergency use only. Valves must be opened.						

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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

**TABLE K
Water Supply System Interconnections**

Interconnect with:	Location Description (also, please provide a location map)	Existing/ Proposed	Size	Capacity	Metered?	Status
Palm Beach County	Jog Road & Sunstream Blvd.	Existing	10 inch	979 gpm	Yes	Yes

Please discuss any operational constraints that would inhibit use of the interconnect:
Primarily for emergency use only. Valves must be opened.

Interconnect with:	Location Description (also, please provide a location map)	Existing/ Proposed	Size	Capacity	Metered?	Status
Palm Beach County	Congress Avenue	Existing	6 inch	627 gpm	Yes	Yes

Please discuss any operational constraints that would inhibit use of the interconnect:
Primarily for emergency use only. Valves must be opened.

Interconnect with:	Location Description (also, please provide a location map)	Existing/ Proposed	Size	Capacity	Metered?	Status
Deerfield Beach	South City Line & A1A	Existing	8 inch	803 gpm	Yes	Yes

Please discuss any operational constraints that would inhibit use of the interconnect:
Primarily for emergency use only. Valves must be opened.

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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

**TABLE K
Water Supply System Interconnections**

Interconnect with:	Location Description (also, please provide a location map)	Existing/ Proposed	Size	Capacity	Metered?	Status
Deerfield Beach	Hillsboro Canal & Interstate 95	Proposed	8 inch	803 gpm	Yes	Yes

Please discuss any operational constraints that would inhibit use of the interconnect:
 Would be primarily for emergency use only. Valves would have to be opened.

Interconnect with:	Location Description (also, please provide a location map)	Existing/ Proposed	Size	Capacity	Metered?	Status
Highland Beach	North City Limits & A1A	Existing	10 inch	979 gpm	Yes	Yes

Please discuss any operational constraints that would inhibit use of the interconnect:
 Primarily for emergency use only. Valves must be opened. Used during Hurricane Wilma (see Table E)

Interconnect with:	Location Description (also, please provide a location map)	Existing/ Proposed	Size	Capacity	Metered?	Status

Please discuss any operational constraints that would inhibit use of the interconnect:

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orm 0645-G73 (08/03)

- **Outstanding Compliance Issues (required upgrades or expansion etc.)**

The City of Boca Raton's Utility Services Department continuously evaluates and maintains the integrity of its facilities. As regulations are enacted, a pro-active approach to achieve compliance before deadlines is practiced. The most recent upgrades to the water treatment processes involved the movement of chlorine disinfection injection points to meet the requirements of the EPA's Groundwater Rule. Currently there are no outstanding compliance issues that require upgrades or expansion.

3.6 Water Supply Provided by Other Entities

In 2013, a parcel of land zoned for single-family residential use was incorporated into City limits from Unincorporated Palm Beach County. The utility servicing this area is Palm Beach County Water Utilities Department (PBCWUD). The demands for this area are accounted for in PBCWUD's Water Supply Plan. Also, the City has no areas of domestic self-supply.

3.7 Conservation

A number of steps have been taken by the City to reduce raw water demand. The City utilizes a water conservation rate structure and performed a rate analysis in 2007. As a result of the rate analysis study, it was concluded the tiered water conservation model was appropriate and the City adjusted rates in January 2008 and since then has only adjusted the rates by the Consumer Price Index (CPI). The City has also implemented, as of January 1, 2008, a tiered water conservation rate structure for reclaimed water. The new commodity rates, effective October 1, 2014, are as follows:

<u>Potable Water Rates:</u>	
0-25,000 Gallons	\$0.78/1000 Gallons
25,001-50,000 Gallons	\$1.88/1000 Gallons
50,001 & Above	\$2.40/1000 Gallons
<u>Reclaimed Water Rates:</u>	
0-25,000 Gallons	\$0.47/1000 Gallons
25,001-50,000 Gallons	\$0.58/1000 Gallons
50,001 & Above	\$0.70/1000 Gallons
City Controlled Delivery System	\$0.47/1000 Gallons

The City continues to undertake and expand education programs to promote water conservation. The first mailing of conservation information went out in August 1989 to customers of more than 28,000 accounts. This resulted in an estimated 600 telephone calls from customers, most of who requested and were given water conservation information. Revisions to the City's Community Appearance Board criteria include Xeriscape techniques and principles

In the past four years, education programs for school-aged children and other local groups have been delivered to over 14,000 people. Tours of the water treatment plant and wastewater treating plant are given regularly to educate people on where their water comes from and how it can be conserved.

The Utility Services Department has one of the lowest unaccounted-for-water ratios in the area at approximately 3%. The industry standard goal is 10% or less.

The City requires low-volume plumbing fixtures. These requirements are part of the City's building code.

The Utility Services Department submitted to the South Florida Water Management District a water conservation program along with the CUP permit application in 2006.

Currently the City's IRIS reclamation facility produces an average of 7 million gallons of reclaimed water per day. The City's expansion of the on-site production capacity of the IRIS reclamation facility to a 17.5 million gallons a day was completed in August 2010. During the same time, the City is also expanded the distribution system for the reclaimed water including the construction of a 5.0 MG off-site storage tank. Expanding the reclaimed water distribution system resulted in making reclaimed water available to additional large users such as golf courses, parks, and schools.

Raw water withdrawals for irrigation use will be offset with the use of reclaimed water and a positive impact on the regional system will result by increasing the availability and use of reclaimed water from 7 million gallons a day to ~13.0 million gallons a day (100% of the available influent).

3.7.1 Regional Issues

Water Conservation Plans

The City of Boca Raton Utility Services Department provided a water conservation plan as part of the 2006 CUP renewal application. The plan addresses:

1. Limitation of lawn and ornamental irrigation hours

Appendix L to the City's Water Conservation Plan (submitted as Item IV-12 and was presented in Appendix H of the 2000 WUP renewal application) includes a copy of an Ordinance No. 3857, setting forth the limitation of landscape irrigation hours. In summary, the ordinance applies to "all use of water for irrigation regardless of source, except reclaimed water or treated effluent." Irrigation is prohibited on Friday and between the hours of 8:00 AM and 5:00 PM on Saturday through Thursday. Irrigation during allowed hours is limited to a non-consecutive three days a week (based upon property address) for a period of no more than four hours for a parcel of property less than five acres in size. Variances are allowed only if issued by both the SFWMD and the City.

In addition to enforcing the ordinance, the City issues reminders of these irrigation restrictions through notes on water bills as well as stand-alone mailers.

Sec. 17-57 - Landscape Irrigation Restrictions.

(1) Application. The provisions of this section shall apply during all periods of time in which no water use restrictions, as provided in sections 17-55 and 17-56, are in effect. The provisions of this section shall apply to all use of water for irrigation regardless of source, except

- (a) reclaimed water may be utilized for irrigation purposes each day of the week from 5:00 p.m. through 8:00 a.m., and
- (b) irrigation with reclaimed water by golf courses shall be exempt from all day of the week and time restrictions.

(2) Restrictions. The use of water for sprinkling or other irrigation of lawns, landscaped areas, golf courses or other outdoor vegetation in the city is restricted as follows:

- (a) The use of water for sprinkling and irrigation is prohibited on Friday and between the hours of 8:00 a.m. and 5:00 p.m. Saturday through Thursday.
- (b) Water use between the hours of 5:00 p.m. and 8:00 a.m. Saturday through Thursday shall be limited to 3 days a week as follows:
 1. Property with odd-numbered addresses shall be permitted to irrigate on Monday, Wednesday and Saturday. An odd-numbered address means a house address, box number or rural route ending in the number 1, 3, 5, 7 or 9 or the letters N through Z.
 2. Property with even-numbered addresses shall be permitted to irrigate on Tuesday, Thursday and Sunday. An even-numbered address means a house address, box number or rural route ending in the number 0, 2, 4, 6 or 8 or the letters A through M and property which has no street address.
 3. Irrigation shall not extend beyond a 4-hour period on any given parcel of property less than 5 acres in size.

(3) Variances. Any user holding a valid variance issued by the South Florida Water Management District may continue to avail himself of the provisions of the variance upon filing of the variance with the city.

(4) Enforcement. Every police officer having jurisdiction in the area governed by this section shall, in connection with all other duties imposed by law, diligently enforce the provisions of this section. In addition, the city manager may also delegate enforcement responsibility for this section to other departments of city government.

(5) Penalties. Violation of any provision of this section shall be subject to the following penalties:

- (a) For the first violation, by a fine not to exceed \$50.00.
- (b) For as second violation, by a fine not to exceed \$150.00.
- (c) For a third violation, by a fine not to exceed \$250.00 and by termination of water service to the premises until the violation is corrected.

Each day in violation of this section shall constitute a separate offense. Law enforcement officials and others as delegated may provide violators with no more than 1 written warning. In addition to the sanctions contained herein, the city may take any other appropriate legal action, including but not limited to emergency injunctive action, to enforce the provisions of this section.

(Code 1966, § 24-13; Ord. No. 3857, § 1(24-14), 7-10-90; Ord. No. 4476, § 1, 12-14-99)

2. Use of Xeriscape principles

The City's Water Conservation Plan discusses conservation measures related to the use of Xeriscape – now Florida Friendly Landscaping principles. Ordinance No. 3861 sets forth landscaping requirements and criteria, including the use of Xeriscape – now Florida Friendly Landscaping principles such as water reduction measures, use of native vegetation, and ratios of vegetation species mixing. Additionally, the ordinance requires landscaping plans to satisfy a minimum use of Xeriscape – now Florida Friendly Landscaping as determined by a point-system awarded to designs.

Additional efforts by the City to promote the use of Florida Friendly Landscaping principles include the mailing of Florida Friendly Landscaping materials, airing of Florida Friendly Landscaping videos on the City's cable television channel, development of a Florida Friendly Landscaping demonstration site, and the publication of Florida Friendly Landscaping articles in "Liquid Assets" and "Water Conservation Update," newsletters published and distributed by the City of Boca Raton Utility Services Department.

Requirement of ultra-low volume plumbing in new construction:

As part of its Water Conservation Plan, the City of Boca Raton adopted the requirements of the Water Conservation Act (Florida Statutes, Section 533.14) regarding plumbing codes (through Ordinance No. 3905) and the required use of ultra-low volume plumbing in new construction. The City also distributes information about water saving devices, including low-flow shower heads and toilets, as part of its general public information program.

3. Water conservation-based rate structures

In August 1989, the City Council adopted a three-tiered water rate structure (through Ordinance No. 3787) to encourage water conservation. Water rates are assessed bi-monthly and are based on "the use of the property receiving water and the amount consumed." For residential customers, the rates are further divided by in-City and out-of-City users. For water usage between 1,000 and 24,999 gallons (on a bimonthly basis), in-City customers pay \$0.55 per 1,000 gallons, and out-of-City customers pay \$0.69 per 1,000 gallons. For customers consuming 25,000 to 49,999 gallons, the rates increase to \$1.31 and \$1.64 per 1,000 gallons for in-City and out-of-City customers, respectively. Finally, for consumption of 50,000 gallons or greater, the rates again increase to \$1.68 and \$2.10 per 1,000 gallons for in-City and out-of-City customers, respectively.

4. Leak detection programs

In an effort to reduce water leakage throughout the distribution system, the City tests, calibrates, and repairs or replaces (when necessary) water meters. These actions can be initiated by customer complaints, meter reading/billing staff, distribution network system mechanics, or through the program of regular testing of the larger water meters in the system.

5. Requirements of rain-sensor override for new lawn sprinkler systems

The City adopted Ordinance No. 4289 that requires "any lawn sprinkler system connected to the potable water supply shall be equipped with a rain sensor device which will override the irrigation cycle of the sprinkler system when adequate rainfall has occurred." As of

January 1, 1997, these sensors were required on all new landscaping sprinkler systems, except those using reclaimed water. As a reminder of this ordinance requirement, the City airs a public service announcement on the cable television channel and publishes notes on customers' water bills.

6. Water conservation public education programs

The City has a general public information program through which it promotes water conservation. Elements of the program include publishing and distributing of newsletters ("Liquid Assets" and "Water Conservation Update"), hosting an open house at the Utility Services complex, participating in local events such as the Engineer's Week celebration at FAU, and maintaining various water conservation materials (pamphlets and videos) that can be either mailed to customers or aired on the City's cable television channel. Educational/Outreach programs are also conducted for local civic groups, homeowners associations, and schools. The City also participates in local environmental programs and has purchased Enviroscape, a working model of a coastal ecosystem, and the City has made over 700 customer contacts with Enviroscape in the past year alone.

7. Analysis of economic, environmental, and technical feasibility of reusing reclaimed and/or recycled water

This analysis has been completed. As a result of the findings, the City is using approximately 1.0 MGD of reclaimed water for process and irrigation water at its wastewater treatment plant. The City has also installed Project IRIS (In-City Reclaimed Irrigation System) that provides approximately 4.24 mgd of reclaimed water to approximately 770 customers including single-family homes, FAU, a number of commercial green spaces along Glades Road and Federal Highway, and a number of condominiums and golf courses in the southeastern part of the city. The project has expanded into the Royal Palm Yacht and Country Club residential section. Further expansion of the system will include bringing Lynn University on-line in the 2006-2007 timeframe as well as the new City library and park planned for the T-Rex area. Project IRIS pumps an average of greater than 4.24 MGD resulting in a total reclaimed water use of over 5.24 MGD which is a preservation of greater than one billion of gallons of fresh water per year. In an effort to increase the amount of fresh water that can be preserved, the City requests that SFWMD encourage other permitted irrigation water users to connect to the Project IRIS system, if available, when permits are up for renewal.

8. A schedule and processes for implementing, assessing, and periodically updating the water conservation plan

The City's water conservation efforts meet all of the requirements from SFWMD. Certain elements of the program, such as the limitation of landscape irrigation, are monitored continuously and appropriate enforcement actions are taken. Additionally, the City regularly communicates water conservation requirements to its customers through the use of newsletters, public service announcements, and community events. Therefore, the water conservation plan is continually assessed by way of its implementation and modifications are made, as necessary.

9. Any other appropriate elements

In 2006, the City has begun calculating Unaccounted for Water (UAW) on a monthly basis using the attached framework to monitor the system to detect potential inconsistencies and possible leaks and/or misuse of the potable water.

The City has also been adhering to the SFWMD regulations regarding water conservation from the Draft Consolidated Water Supply Plan Support Document (June 2004).

Analysis of Conservation Element EAR

Specific items contained in the city's Analysis of Conservation Element EAR are as follows:

OBJECTIVE CONS.2.1.0: Prevent further degradation and improve the quality of water sources and waters that flow into surface water resources.

Monitoring Measure. The following are the adopted monitoring measures for this objective:

1. Continue to participate with Palm Beach County for the protection and enhancement of source surface and groundwater resources.
2. Require new developments or redevelopments to provide drainage systems consistent with the water quality level of services set forth in the Drainage Subelement Policy 5.1.1.

Objective Achievement Analysis. City pursues interlocal agreements with appropriate agencies to ensure correction of localized stormwater drainage system deficiencies. The City has adopted ordinances to regulate marina and boating activities to protect and conserve water quality and marine habitats.

OBJECTIVE CONS.2.2.0: Protect the groundwater recharge areas from pollution.

Monitoring Measure. Policies have been established in the Aquifer recharge Subelement to protect groundwater recharge areas.

Objective Achievement Analysis. The City has implemented programs to slow the depletion of and increase the recharge of the local groundwater resources.

- Since June 1987, the City has operated a pump which diverts as much as 44 mgd of surface water from the Hillsboro Canal into the E-2-E (Turnpike) Canal (SFWMD WUP No. 50-01568 – W). This recharges the groundwaters of the E-3 sub-basin.
- The City's reclaimed water program, Project IRIS (In-city Reclamation Irrigation System), replaces as much as six (6) mgd of raw and treated freshwater which would be withdrawn and used for irrigation. Most of this reclaimed water is applied as irrigation and returns to the shallow aquifer.

OBJECTIVE CONS.2.3.0: Provide adequate potable water quality and quantity for the City's present and projected needs.

Monitoring Measure. Policies have been established in the Potable Water Subelement to provide adequate potable water quality and quantity, and to protect existing wellfield sites.

Objective Achievement Analysis. The Glades Road lime softening water plant was constructed in 1973. Like most southeastern Florida water treatment plants, groundwater was treated and disinfected with chlorine. In the early 1980's, research found that chlorine could react with naturally occurring organic matter in certain raw waters to create unhealthy by products (DBPs), including Trihalomethanes (TTHMs).

In 1983, the City of Boca Raton switched from chlorine to chloramines for disinfection to reduce THM levels. Unfortunately, that allowed more of the natural color in our water to pass through the treatment process, creating noticeable levels of color in our drinking water. It also produced TTHMs in the upper range of allowable concentrations and the City was aware that USEPA planned to lower the acceptable levels of THMs.

In 1992, the City Council approved exploring other treatment methods. After many years of studies and pilot testing, a membrane softening plant (MSP) was designed and construction began in 2001. The initial phase of this plant, the largest of its kind in the world, was put into service in August 2004. Since that time, the City has seen a significant reduction of both color and THMs. This water is blended with the lime-softened water to produce a safe, aesthetically pleasing product.

The City Utility Services laboratory staff routinely monitors water quality from all active municipal wells, plus a number of monitoring wells. Staff conducts semi annual standard raw water analyses for compliance purposes. Staff also continues to conduct supplemental annual wellfield analyses for primary organic contaminants, though this is no longer required by any regulatory agency.

The City works vigorously to install sanitary sewers in areas currently served by individual septic tanks. The Spanish Village project was completed in 2004. Funds are identified in the CIP for special assessment projects in Hidden Valley, Boca Raton Hills, and Area II (commercial area north of Glades Rd). This reduces the possibility of groundwater contamination due to leaking septic tanks. The City coordinates with FDOH to require property owners to properly abandon any septic tanks.

OBJECTIVE CONS.2.4.0: Continue to conserve potable water resources.

Monitoring Measure. The following are the adopted monitoring measures for this objective:

1. Continue to cooperate with SFWM to conserve potable water resources through programs.

Objective Achievement Analysis. Beginning with public workshops in the summer of 2001 and culminating with the publication of the Water Conservation Initiative (WIC) Report, the Florida Department of Environmental Protection (FDEP) coordinated a statewide effort to "identify cost-effective, practical measures to use water more efficiently". The report contains over 50 "priority recommendations" addressing issues including:

- Agricultural irrigation
- Water pricing
- Reuse of reclaimed water
- Landscape irrigation
- Indoor water use
- Industrial/commercial/institutional uses
- Research
- Education and outreach

The City of Boca Raton's Utility Services staff participated in this effort. Staff continues to participate in ongoing projects, including an effort to identify performance measures for water conservation programs. As directed by several policies adopted in the 1989 Comprehensive Plan and 1996 EAR, the City continues to implement a number of programs directed towards water efficiency, including:

- The City's reclaimed water program, Project IRIS (In-city Reclamation Irrigation System) has been funded since 1990 for an estimated total cost of about \$20 million. There are currently almost 900 customers, including the Boca Raton Community Hospital, Florida Atlantic University, the Boca Raton Resort and Club, two golf courses, 46 multi-family residences, 83 businesses, many acres of City parks and median strips, and over 700 single family homes. Average daily demand is 5.6 mgd with a maximum day demand of 6.8 mgd. Without Project IRIS, this irrigation water would have been potable water, or untreated surface or ground waters – all part of our local freshwater resources. Project IRIS funding is included in the next five (5)-year planned CIP expenditures. Currently under design is a project to extend reclaimed water lines to the former T-Rex property, the site of the City's future Western/Spanish River library.
 - The City continues to use a tiered water rate structure that encourages water conservation.
 - The City continues to enforce the provisions of City Code of Ordinances, Section 17-57, adopted in 1990, which generally limits irrigation to a maximum of three (3) times a week during non-daylight hours.
 - The City continues to vigorously enforce the provisions of the SFWMD water shortage plan when a water shortage is declared.
 - The City continues to require rain sensors be installed on new irrigation systems.
 - A number of programs contribute to a low "Unaccounted for Water" percentage for our system. One way of calculating this number is by comparing the difference between what is pumped from the plant and what is metered is 2.49%, below the industry goal of 10 %. This means that the City of Boca Raton has a "tight" system, with very little leakage or "lost" water.

3.7.2 Local Government Specific Actions, Programs, Regulations, or Opportunities

The City will coordinate future water conservation efforts with the SFWMD to ensure that proper techniques are applied. In addition, the City will continue to support and expand existing goals, objectives and policies in the comprehensive plan that promotes water conservation in a cost-effective and environmentally sensitive manner. The City will continue to actively support the SFWMD in the implementation of new regulations or programs that are design to conserve water during the dry season.

3.7.2 Identify any Local Financial Responsibilities as Detailed in the CIE or CIS

Three projects listed in the City of Boca Raton’s CIE involving the Water Treatment facilities are described below.

CIP Project Request							
Project Title Raw Water Well Equipment/Expansion						Date:	10/01/13
						Priority:	5
						Project #:	470228
Location Various areas		Department UTILITY SERVICES			Contact Person(s) N. T. Wellings		
Project Description Construction and rehabilitation of wells.							
Project Justification The 56 wells in the water system require periodic rehabilitation to maintain their capacity and water quality. This also includes 3 additional production wells for future development.							
Account #	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	
473-4279-536-6533	750,000	750,000	750,000	750,000	500,000	500,000	
Total	750,000	750,000	750,000	750,000	500,000	500,000	
Funding Request	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Construction	750,000	750,000	750,000	750,000	500,000	500,000	4,000,000
Total	750,000	750,000	750,000	750,000	500,000	500,000	4,000,000
Funding Source	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
WRR	750,000	750,000	750,000	750,000	500,000	500,000	4,000,000
Total	750,000	750,000	750,000	750,000	500,000	500,000	4,000,000
Operational Impact	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Capital Outlay	-	-	-	-	-	-	-
Other Operating	-	-	-	-	-	-	-
Personnel	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-

This project entails funding the periodic rehabilitation of existing wells to maintain their capacity and water quality. This project is critical so that the City can provide raw water supply through the 2034 condition and mitigate salt water intrusion.

CIP Project Request

Project Title
Water Network System Improvement

Date: 10/01/13
Priority: 11
Project #: 470258

Location City-Wide	Department UTILITY SERVICES	Contact Person(s) Lisa Wilson-Davis
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Project Description
Replacement of old galvanized water services.

Project Justification
Based on the past several years these deteriorated water services have caused damage to roads. This project will inventory and replace these services in a timely fashion. Additionally water distribution mains may be upsized for future development.

Account #	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	
473-4279-538-6405	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
Total	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	

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Funding Request	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Construction	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	6,000,000
Total	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	6,000,000

Funding Source	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
WRR	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	6,000,000
Total	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	6,000,000

Operational Impact	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Capital Outlay	-	-	-	-	-	-	-
Other Operating	-	-	-	-	-	-	-
Personnel	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-

This project entails the ongoing replacement of aging galvanized water service lines to meters on an as needed basis ensuring the reliability of our water services. The galvanized water service lines have a limited life expectancy are being replaced with polyethylene piping. The replacing of the aging galvanized water service lines ensure reliable and quality water services to our customers.

CIP Project Request

Project Title
Membrane Replacements

Date: 10/01/13
Priority: 14
Project #: 470043

Location
Water Treatment Plant

Department
UTILITY SERVICES

Contact Person(s)
N. T. Wellings

Project Description
Replacement of the membranes at the membrane softening facility.

Project Justification
Over time and use, the membranes used for water treatment require replacement.

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Account #	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
473-4279-536-6406	4,500,000	-	-	-	-	-
Total	4,500,000	-	-	-	-	-

Funding Request	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Equipment Purchase	4,500,000	-	-	-	-	-	4,500,000
Total	4,500,000	-	-	-	-	-	4,500,000

Funding Source	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
WSOF	4,500,000	-	-	-	-	-	4,500,000
Total	4,500,000	-	-	-	-	-	4,500,000

Operational Impact	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Capital Outlay	-	-	-	-	-	-	-
Other Operating	-	-	-	-	-	-	-
Personnel	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-
Total	-						

This project is for the replacement of membranes at the membrane softening facility. The existing membranes have long-exceeded their anticipated lifespan due to the excellence in operation and maintenance by City staff.

3.8 Reuse

3.8.1 Regional Issues

State law supports reuse efforts. Florida's utilities, local governments, and water management districts have lead the nation in implementing water reuse programs that increase the quantity of reclaimed water used and public acceptance of reuse programs. Section 373.250(1) F.S. provides that "water reuse programs designed and operated in compliance with Florida's rules governing reuse are deemed protective of public health and environmental quality." In addition, Section 403.064(1), F.S., provides that "reuse is a critical component of meeting the state's existing and future water supply needs while sustaining natural systems."

The City of Boca Raton supports water reuse initiatives under consideration by both the SFWMD and the FDEP. The City has become a 100% reuse facility. In this plan, the City has identified a number of water reuse projects and their respective schedule.

3.8.2 Local Government Specific Actions, Programs, Regulations, or Opportunities

The City will support the SFWMD water reuse projects, and implementation of new regulations or programs designed to increase the volume of reclaimed water used and public acceptance of reclaimed water.

3.8.3 Identify any Local Financial Responsibilities as Detailed in the CIE or CIS

CIP Project Request

Project Title: In-City Reclamation Irrigation System (IRIS) Date: 10/01/13
 Priority: 7
 Project #: 470018

Location: Various Department: UTILITY SERVICES Contact Person(s): Lisa Wilson-Davis

Project Description
 Construction of reclaimed water system components.

Project Justification
 The reclaimed water system is an important part of the City's water conservation program and the wastewater disposal program.

Account #	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
470-4274-535-6371	1,500,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Total	1,500,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000

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Funding Request	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Construction	1,500,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	6,500,000
Total	1,500,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	6,500,000

Funding Source	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
WSOF	1,500,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	6,500,000
Total	1,500,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	6,500,000

Operational Impact	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Capital Outlay	-	-	-	-	-	-	-
Other Operating	-	-	-	-	-	-	-
Personnel	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-
Total	-						

This project is additions/modifications to the reclaimed water system. These components are needed to meet existing and future reclaimed water demands which will offset pumping from the Biscayne Aquifer.

4.0 CAPITAL IMPROVEMENTS

4.1 Work Plan Projects and Schedule

City of Boca Raton Utility Services Water short-term CIP Projects include:

CIP Project Request							
Project Title Water Treatment Facility Improvements						Date:	10/01/13
						Priority:	9
						Project #:	470015
Location Water Treatment Facility		Department UTILITY SERVICES			Contact Person(s) N. T. Wellings		
Project Description Rehabilitation of the lime softening water treatment facilities, membrane softening facility and ancillary equipment							
Project Justification Components of the lime-softening portion at the water treatment facility have been in service since the plant was constructed. The completion of the membrane-softening portion of the water treatment facility will allow these units to be taken off line for rehabilitation.							
Account #	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	
470-4273-533-6372	5,500,000	3,000,000	2,000,000	2,000,000	2,000,000	2,000,000	
Total	5,500,000	3,000,000	2,000,000	2,000,000	2,000,000	2,000,000	
Funding Request	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Construction	5,500,000	3,000,000	2,000,000	2,000,000	2,000,000	2,000,000	16,500,000
Total	5,500,000	3,000,000	2,000,000	2,000,000	2,000,000	2,000,000	16,500,000
Funding Source	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
WSOF	5,500,000	3,000,000	2,000,000	2,000,000	2,000,000	2,000,000	16,500,000
Total	5,500,000	3,000,000	2,000,000	2,000,000	2,000,000	2,000,000	16,500,000
Operational Impact	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Capital Outlay	-	-	-	-	-	-	-
Other Operating	-	-	-	-	-	-	-
Personnel	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-

This project is for ongoing maintenance of the water treatment plants so they may continue to operate at the needed capacity and produce water that meets regulatory standards.

City of Boca Raton Utility Services Water Long-term CIP Projects include:

DEPARTMENT	NO.	PROJECT DESCRIPTION	ESTIMATED COST	OPERATIONAL IMPACT
Water & Sewer	43	<u>Palmetto Park Road Water Main Improvements</u> 250 feet of 12-inch main on NW 4 th Avenue from Pine Circle to Palmetto Park Road 1,340 feet of 8-inch main on Palmetto Park Road from NW 4 th Avenue to NW 2 nd Avenue 1,430 feet of 12-inch main on Palmetto Park Road from NW 4 th Avenue to SE 1 st Avenue.	\$243,000	None

5.0 GOALS, OBJECTIVES AND POLICIES (GOPs)

The City of Boca Raton reviews its GOPs on a regular basis and this document has been developed consistently with the GOPs.

The City of Boca Raton ensure land use and future land use changes are in-line with the availability of water supplies and water supply facilities through a coordinated effort between the Development Services Department and the Utility Services Department. All land use amendments are reviewed and tabulated in the spread sheet on the next page to ensure concurrency. Utility Services Departmental approval is necessary for a land use and future land use change to be approved by the City.

Developer Project Name	Address	Prop LU	Units	SF	Additional Flow GPD	LS Area	Potable Water Impact (MGPD)	Effluent Impact (MGPD)	Existing LU	Developer
Royal Palm Plaza IDA Extension	194 SE 1st Aven	Mixed use	499 units - MF; 250 hotel	267,210 comm.	145,287	25				
Boca Fairways		Mixed use	440 mf	45,000 retail; 20,000 restaurant	113,000	204	0.186000	0.113000		Jeffrey Schnars
331-351 Yamato Road Commerical Development	331-351 NE Yamato Rd	Restaurant, Retail, Child care	4-new buildings	15,000 comm.	9,614	16				Douglas A. Mummaw
East City Center (Trader Joes)	855 S Federal Hwy	Retail, Office	3-new buildings	29,053 comm.	2,905	226				
Camden Boca Raton	131 S Federal Hwy	Residential Condo	261 units - MF		54,027	226				
Palmetto Park Center	111 SE 1St Street	Residential, Retail	208 units - MF	20, 928 retail	104,000	25				RAM Realty Services
Boca Noah	335 & 353 N Federal	Restaurant, Retail	2-buildings	7,100 comm.	7,100	FM				
Premier Park Master Plan	3300 Airport Road	Restaurant, Office		70,000 comm.	7,000	211				
327 Royal Palm Road	327 Royal Palm Road	Residential Multi Family	25 units - MF	102,343 comm.	6,198	25				
Premier Park Restaurant Phase 1 (Tilted Kilt)	3300 Airport Road	Restaurant	1-building	7000 rest.	700	211				
Boca Highlands	100 NW 70th Street	Residential Townhomes	80 units - MF	2,300 sq. ft./unit	16,560	84	0.027000	0.017000	Vacant - 8.5 acres	Jeffrey Schnars
Boca Lofts	40 SE 7 ST	Residential Condo	282 units	299,177 comm.	45,000	226	0.070900	0.045000	23,809 Commercial	Jeffrey Schnars
TR Danburg	6600 Congress Ave	Mixed use	217 units - MF	284,700 retail	46,000	197	0.078600	0.046000	Vacant	J. Michael Marshall and Gray Robinson, PA
900 Broken Sound (Altis)		Mixed use	370 units - MF	224,246 comm.	77,000	179/210	0.128000	0.077000	Vacant	Clifford R. Loutan, P.E.
Women's Health & Wellness Institute BRRH	800 Meadows Road	Hospital Addition	1-building	42,000 inst.	4,200	57			26,7888 SF Women's Center	J. Michael Marshall and Gray Robinson, PA - Kimberly-Horn Civil Engineer (Michael f. Schwartz, P.E.)

Developer Project Name	Address	Prop LU	Units	SF	Additional Flow GPD	LS Area	Potable Water Impact (MGPD)	Effluent Impact (MGPD)	Existing LU	Developer
Via Mizner (Hotel)	700-998 S Federal Hwy	Mixed use	84 units - MF; 118 hotel	43,525 comm.	26,051	33				Penn-Florida Companies
Via Mizner (South Tower)	700-998 S Federal Hwy	Mixed use	366 units - MF;	5,483 office, 11,443 comm	97,256	33				Penn-Florida Companies
Neuroscience Institute Addition BRRH	800 Meadows Road	Hospital Addition	400 Beds	72,892 comm.	7,289	195				Siemon & Larsen, PA
University Park Student Housing	135 NW 20th St	Student Housing	159 units - MF	216,781 comm.	35,080	64				
Archstone	349 E Palmetto Park Rd	Mixed use	350 units - MF	15,000 retail	74,000	25	0.130000	0.074000	Undeveloped	James W. Mahannah, PE
Boca Village Residential	4955 Technology Way	Multi Family	200 units - SF	678,200 comm.	123,020	196			Undeveloped - IG	Bonnie Miskel, Esq.
Tower 155	133-199 E Boca Raton Road	Residential Condo	192 units - MF	364,331	38,400	25	0.061400	0.038400	SF and Commercial	Jeffrey Schnars
Hyatt Place Hotel	120 E Palmetto Park Rd	Hotel, Restaurant	200 Rooms	8,000 retail	8,100	25				Mitchell B. Kirschner
Artis Senior Living Facility	5910 & 5990 N Federal Hwy	Commercial	64 beds	34,412	5,762	13				
Midtown	21046 N. Military Trail	Residential, Retail	649 units - MF	25,600 retail	112,712	110	0.198200	0.112712	Commercial 97,815 SF	Randy Wertepney, PE - Keshavarz & Assoc, Inc.
University Village	555 NW Spanish River Blvd	Mixed use	750 units - MF	471,780 comm.	211,491	68/65			Mixed use - open space	Siemon & Larsen, PA
Island Lakes at Hidden Valley	7601 Country Club Blvd	Multi Family	422 units - MF		85,934	84				Hidden Valley Properties
FAU Research & Development Amendment	3701 FAU Blvd	Mixed use	120 hotel	345,000 comm.	38,800	FM			290,000 sf	Siemon & Larsen, PA
Spanish River Townhomes	4202 N Military Trail	Residential Townhomes	75 units - MF		5,200	FM	0.010800	0.005200	Commercial - 103,390 sf	Bohler Engineering
The Grove	2600 NW 5th Ave	Student Housing	144 units - MF		29,808	65			RL	Mike Schwartz Kimberly Horn and Associates
Boca Congress Multi family	Congress Ave @ North of NW 82 St.	Multi Family	240 units - MF		247,669	235				
Camino Real Fountains		Commercial		21,500 comm.	2,100	116	0.007640	0.002100	Vacant	Richard Brooks, AIA, NCARB
Boca Glades ALF		Multi Family	128 beds		26,496	56				
Total					1,813,758.50		0.8769	0.5304		

In addition to the potable water conservation strategies and techniques discussed previously, the City of Boca Raton has provisions for conserving potable water resources through the implementation of its reuse program, Project IRIS.

The City of Boca Raton Utility Services Department currently treats an average of approximately 14 MGD of influent wastewater at its wastewater treatment plant (WWTP). The WWTP is rated at 17.5 MGD. A 17.5 MGD reclaimed water production facility is co-located next to the WWTP at the Glades Road site. The reclaimed water production facility currently treats an average of 7.0 MGD. The remaining balance of the effluent is discharged via ocean outfall.

Because of off-sets resulting from planned reclaimed water projects, the City of Boca Raton was granted a CUP with an allocation above the 2007 baseline allocation. The potable water demand in excess of the 2007 baseline allocation is projected to occur in mid-2020

- The completion of several reclaimed projects has already resulted offsets that have created a positive balance to the regional system.
- This positive balance has been realized well before the potable water demand exceeds the 2007 baseline allocation.
- Total water saved on the regional system by the reclaimed projects over the 20 year period is over 40 billion gallons.

The City implemented and completed an aggressive reuse plan and has become a fully operational reuse system comprising 100 percent of our annual average daily flow for reuse activities authorized by the FDEP. Construction of reclaimed water infrastructure to serve the list of customers Post 2008 listed below to meet this reuse plan.

Application Site	Annual Allocation (MGD)	Approximate Site Area (Acres)	Irrigation Rate (inches / week)
Boca Raton High School (NW 15 th CT meter) ¹	0.050	13.50	0.955
Boca Raton Middle School (1251 NW 8 th Street) ²	0.050	8.50	1.516
Arvida Park of Commerce ¹	0.100	28	0.921
City of Boca Raton – Patch Reef Park (2000 Yamato Rd.) ²	0.150	27.21	1.421
Boca Corporate Center and Campus (4700 Exchange Ct – RCL MTR6) ²	0.150	20.50	1.886
Boca Raton Airport Properties (3350 Airport Road) ³	0.072	12.50	1.485
Countess de Hoernle Park (1000 NW Spanish River Blvd.) ³	0.350	60	1.504
Lynn University (3601 N. Military Trail) ²	0.500	60	2.148
Broken Sound – East ¹	0.030	240	0.784
Broken Sound – West ¹	0.700		
Woodfield Country Club ²	1.00	160	1.611
Woodfield Country Club – Additional Users ³	0.560	90	1.604
Post-2008 Total:	3.712	---	---

¹ Annual Allocation Based on Allocation Stipulated in the SFWMD CUP.

² Annual Allocation Based on Actual Site Specific Reclaimed Water Usage Data.

³ Annual Allocation Established Based on Conservative Irrigation Rate and Irrigable Site Acreage.

⁴ "Service Area Total" includes the FDEP Baseline Reuse Flow Rate of 5.6 MGD

On December 29, 2014, the City, as required by Subpart III.4 of Administrative Order No. AO-11-007-DW-50-SED issued by the FDEP, submitted a report titled “City of Boca Raton Final Report Reclaimed Water System Compliance Report – December 8, 2014”, prepared by Mathews Consulting which substantiates the City’s existing reclaimed water system in its current configuration is “a fully operation reuse system comprising 100-pecernt of the facility’s annual average daily flow (10.24 MGD) for reuse activities authorized by the Department”. The report also substantiates that the City has installed all of the required infrastructure to comply with requirements stipulated in Subpart III.1 of the Administrative Order which requires the City to provide 60% reuse or “a total of 6.2 million gallons per day (MGD) of additional reuse (over the 2033-2007 reuse baseline) by December 31, 2025.

A review of the estimated reclaimed water demands of the Large User Application sites discussed in the Report substantiates that upon connection of the “Future Large User Application Sites”, the total AADF demands of the City’s reclaimed water system customer base will be approximately 12.96 MGD. This demand estimate includes the reclaimed water baseline flow rate of 5.6 MGD established by FDEP, the total annual allocation (3.712 MGD) established for the “Post-2008” sites, as well as the total annual allocation (3.646 MGD) established for the “Future” sites.

A comparison of the total AADF reclaimed water demand for the service area with the statutory reclaimed water flow criteria confirms that the City will comply with all stipulated criteria upon connection of the “Future” sites, specifically upon connection of Boca West Country Club and Community. A comparison of the reclaimed water system demands with the statutory reclaimed water flow criteria is presented below:

Parameter	Flow (MGD)
FDEP Baseline Reclaimed Water Flow (2003-2007)	5.60
Post-2008 Large User Application Sites	3.712
Current Total:	9.312
Future Large User Application Sites	3.646
Future Total:	12.96
Total Reclaimed Water Flow Required for 100% Reuse Designation by December 31, 2018	10.3
Excess Demand over Specified Statutory Flow Criteria:	+2.66
Minimum Reclaimed Water System Capacity Required by December 31, 2025	11.80
Excess Demand over Specified Statutory Flow Criteria:	+1.16

Realizing the need to maintain environmental stewardship and invest in alternative water supplies; the City now has the ability to supplement the reclaimed water supply with membrane concentrate and is committed to the continued expansion of its reclaimed system infrastructure

6.0 REGIONAL ISSUES IDENTIFIED IN REGIONAL WATER SUPPLY PLANS

A summary of the issues in the Lower East Coast Water Supply Plan can be found below. More detailed information can be found in the applicable Regional Water Supply Plan; a web link has been included for additional information.

6.1 Lower East Coast Water Supply Plan

Detailed information on the regional issues can be found in Chapter 5, Evaluation of Water Source Options, in the Lower East Coast Water Supply Plan. The information can be accessed at:

http://www.sfwmd.gov/portal/page/portal/xweb%20-%20release%203%20water%20supply/lower%20east%20coast%20plan#wsp_docs

Briefly, the issues are:

1. Increased withdrawals from both the Surficial Aquifer System and surface water from Lake Okeechobee are limited
2. Conservation continues to be relied upon to reduce per capita use and a means to potentially delay or perhaps avoid adding capacity
3. Use of reclaimed water continues to be important alternative source in the region and helps to meet requirements of the 2008 Leah G. Schad Ocean Outfall Program