# UTILITIES ELEMENT

## POTABLE WATER SUBELEMENT
## GOALS, OBJECTIVES AND POLICIES

**GOAL 1:** PROVIDE CITY RESIDENTS AND OTHER LOCAL GOVERNMENTS THAT RECEIVE POTABLE WATER WITH RELIABLE SERVICE.

**Objective 1.1:** New development within the City's Potable Water Service Area shall be approved only when adequate water supply, treatment and distribution capacity is available to provide, or provisions are included (as identified in Capital Improvement Element Policies), for the needed potable water or when the developer obligates funds to provide that development's share of capital improvements to any of these systems, as well as the distribution systems within the development.

**Policy 1.1.1:** The City shall coordinate closely with local governments that receives potable water from the City to ensure they provide the City with an annual report including 5-year and 10-year projections of population, land use and water usage information.

**Policy 1.1.2:** Applicants seeking development approvals shall obtain a written water availability statement from the City indicating an adequate water supply consistent with the established level of service (LOS) standards available to serve the development. At a minimum, the water availability statement shall indicate an adequate water supply will be available and all required delivery infrastructure shall be fully constructed and operable prior to the issuance of the Certificate of Occupancy.

**Policy 1.1.3:** The following level of service standards shall serve as the basis for determining the demand and future capacity needs to be generated by a development. The level of service standard is based on the Water Use Permit (Permit # 50-00615-W). The City has set a goal of 250 gpcd for water usage in future years:

| Average Water Consumption Rate | (gallons per capita per day-gpcpd) |
|---|---|
| West Palm Beach Service Area | 272 |

**Objective 1.2:** The City shall continue to annually evaluate programs and construction projects to identify necessary repairs and add to the potable water delivery system to correct existing facilities and distribution deficiencies.

**Policy 1.2.1:** The City shall continue to implement an on-going program of inspection and replacement of water lines which are determined to be in a deteriorated condition. Priorities for this work shall be established within the planned capital projects. Additionally, the Utilities Department shall continue to identify and implement appropriate measures to safeguard the quality of the City's potable water.

**Policy 1.2.2:** The City shall continue with programs such as water quality monitoring nodes, automatic flushing units, free chlorination, reviewing the system to provide looped

service among other programs to continuously monitor and improve water quality in the distribution system.

**Objective 1.3:** Pursuant to the South Florida Water Management District 20-year Consumptive Use Permit (2013), per capita use of potable water within the West Palm Beach Service Area shall be maintained at 272 gallons per capita per day.

**Policy 1.3.1:** The City shall continue to educate water users of the importance of water conservation and coordinate with the South Florida Water Management District in the implementation of water conservation programs such as but not limited to:

a) Encourage the use of water saving plumbing devices in new and existing structures.

b) Reduce water line loss through leak detection, valve exercises and regular repair and replacement.

c) Aggressively pursue the use of wastewater reuse for landscaping within rights-of-way,- golf courses and parks.

d) Promote xeriscape practices when considering all proposals for development and/or redevelopment.

**Policy 1.3.2:** The City shall continue to implement a water conservation program aimed at the consumer and monitor water usage to study the results of the program.

**Policy 1.3.4:** The City shall continue to employ structured water rates as an incentive that supports this objective of potable water conservation.

**Objective 1.4:** In order to discourage urban sprawl, the City shall concentrate new development around existing or planned infrastructure, including potable water facilities.

**Policy 1.4.1:** The City shall discourage urban sprawl by adhering to the concurrency requirements and level of service standards outlined within this comprehensive plan, including those for potable water facilities.

**Policy 1.4.2:** The City shall construct additional infrastructure and/or facilities for potable water delivery as it deems necessary to accommodate projected needs.

**Objective 1.5:** The City has planned for future water supplies to assure future water demands are met through the implementation and updates of the 10 Year Water Supply Facility Work Plan (incorporated into this Element as the 10 Year Water Supply Facility Work Plan SubElement) and incorporated alternative water supply projects identified in the South Florida Water Management District's regional water supply plan pursuant to s. 373.0361(2)(a) or proposed by the County under s. 373.0361 (7)(b).

**Policy 1.5.1:** The City shall continue to coordinate with the South Florida Water Management District regarding water supply efforts and shall incorporate into the 10 Year Water Supply Facility Work Plan, as appropriate, any updates to the South Florida Water Management District Lower East Coast Regional Water Supply Plan.

**Policy 1.5.2:** The City shall continue to coordinate population projections and future annexation areas with local governments within the City's potable water service area through the following actions:

- An ongoing review, through the Intergovernmental Plan Amendment Review Committee (IPARC) notification system, of all future land use amendments to properties located within the City's potable water service area;
- Once-a-year notification, requiring local governments within the City's potable water service area to provide the City with (i) major development plans affecting the service/future annexation area; and (ii) population projections, if different from those provided by Palm Beach County; and
- Yearly notification, requesting Palm Beach County to provide current population projections.

**Policy 1.5.3:** The City shall coordinate its level of service (LOS) standards for potable water with local governments within the City's service area, through the following actions:

- The City shall contact local governments within the City's potable water service area to provide them with information on any changes regarding current LOS standards or any changes of future LOS standards to be included in the Comprehensive Plan and the renewal of local service agreements; and;
- The City shall provide local governments within the City's potable water service area with its potable water conservation measures, including reuse.

**Policy 1.5.4:** The City shall provide local governments within the City's potable water service area with a copy of its annual update of the Capital Improvements Schedule (CIS) for all capacity-related water supply facility projects to be included in the respective updates of their CIS.

## SANITARY SEWER SUBELEMENT
## GOALS, OBJECTIVES AND POLICIES

**GOAL 1:** THE CITY SHALL CONTINUE TO MEET ITS SANITARY SEWER NEEDS AND SHALL COORDINATE WITH LOCAL GOVERNMENTS THAT IT SERVES IN ORDER TO MEET THEIR FUTURE PLANNING NEEDS.

**Objective 1.1:** The City shall continually ensure that future demands for sanitary sewer can be met for at least a 10-year planning horizon.

**Policy 1.1.1:** The City shall coordinate closely with local governments that receive treatment service to ensure they provide the City with 5-year and 10-year projections of future wastewater needs and flows based on population projections, development activity, and wastewater generation estimates.

**Policy 1.1.2:** The City shall treat wastewater from the service area to meet current and future State and Federal standards.

**Policy 1.1.3:** The City shall coordinate with the communities holding large user agreements to ensure their comprehensive plans and development permit procedures are compatible with the City of West Palm Beach policies with regard to waste water generation, collection, transport, treatment and disposal.

**Objective 1.2:** In order to discourage urban sprawl, the City shall maximize the use of existing facilities by concentrating new development activity around existing or planned infrastructure, including sanitary sewer facilities.

**Policy 1.2.1:** The City shall discourage urban sprawl by adhering to the concurrency requirements and level of service standards for sanitary sewer.

**Policy 1.2.2:** The City shall construct additional infrastructure and/or facilities for sanitary sewer delivery as it deems necessary to accommodate projected needs.

**Objective 1.3:** The City shall ensure that development permits are issued only if adequate capacity is available concurrent with the impacts of development.

**Policy 1.3.1:** The City shall continue to prepare annual summaries of built and approved development within its service area~~.~~

**Policy 1.3.2:** The following level of service standards shall serve as the basis for determining current or future capacity requirements:

## WASTE WATER COLLECTION

| DEVELOPMENT TYPE | AVG. DAILY WASTE WATER FLOW |
|---|---|
| Single Family | 350 gpd/DU |
| Multifamily | 250 gpd/DU |
| Commercial | 0.20 gpd/SF |
| Industrial | 0.15 gpd/SF |
| Hotel | 100 gpd/room |

DU = dwelling unit
SF = square feet
gpd = gallons per day
AC = acre

## PUMP STATION PEAKING FACTORS

| PEAKING FACTOR | AVG DAILY FLOW (MGD) |
|---|---|
| 3.5 | 0.01 to 0.05 |
| 3.0 | 0.05 to 0.25 |
| 2.5 | 0.25 to 2.0 |
| 2.0 | > 2.0 |

Peaking factors for other facilities shall be determined using historical flow records.

**Policy 1.3.3:** All improvements shall be consistent with the Environmental Control Rules (ECR) or with Palm Beach County Standards, where applicable.

**Policy 1.3.4:** Permits for future development shall not be issued if flow from the development will cause overloaded conditions within the sewage treatment facilities until improvements can be completed to bring treatment/transmission systems up to capacity and up to adopted standards.

**Policy 1.3.5:** Sanitary sewer lines shall be installed, either by the City, or through City-approved agreements to meet sanitary sewer level of service requirements.

**Policy 1.3.6:** The City shall prepare a capacity analysis for the wastewater treatment plant in accordance with State and Federal regulations. The analysis shall be updated annually when a capacity increase is necessary within the next 10 years. Design for additional capacity in the City service area shall begin before a facility is 3 years away from the need for on-line capacity expansion determined by the capacity analysis.

**Objective 2.1:** The City shall develop a list of capital improvement projects, to be updated annually, identifying needs in 5-year planning increments.

**Policy 2.1.1:** The capital improvement projects list shall be comprehensive and include

projects from all departments of the City government.

**Policy 2.1.2:** The City shall evaluate and rank the list of capital improvement projects in order to logically distribute funding for the various projects.

**Policy 2.1.3:** Projects which correct existing deficiencies to an adopted level of service, shall be ranked ahead of those required for projected shortfalls.

**Objective 2.2:** The City shall ensure the maximum use of existing facilities and discourage urban sprawl while expanding the City tax base sufficiently to provide adequate services to all within its service area.

**Policy 2.2.1:** New capital projects shall be constructed preferably in a compact loop design around the existing collections and treatment facilities in order to maximize the use of new facilities and minimize the cost to the City.

## SOLID WASTE SUBELEMENT
## GOALS, OBJECTIVES AND POLICIES

**GOAL 1:** THE CITY SHALL CONTINUE TO PROVIDE COLLECTION AND TRANSPORT OF GARBAGE, VEGETATIVE WASTE, BULK TRASH AND RECYCLABLES TO MEET THE CITY'S EXISTING AND 10-YEAR PROJECTED DEMANDS.

**Objective 1.1:** The City shall continue to implement procedures to discourage urban sprawl and ensure that at the time a development permit is issued, adequate solid waste disposal capacity is available or will be available when needed to serve the development.

**Policy 1.1.1:** The following collection and disposal level-of-service standards are hereby adopted for determining the availability of facility capacity and the demand generated by development:

Collection
The City shall adhere to the Franchise Agreement of the Solid Waste Authority by providing a minimum level of service for residential garbage collection of twice per week, bulk trash collection of once per week, vegetation collection of once per week, and recyclable collection of once per week.

Disposal
The City shall ensure delivery of solid waste material collected to the Solid Waste Authority (SWA) North County Landfill and shall continue to seek annual certification from the SWA that it has sufficient disposal capacity to accommodate the solid waste generated for both the five (5) year and ten (10) year planning periods. The SWA certification letter shall constitute compliance with the City's Solid Waste LOS standard.

**Objective 1.2:** The City shall continue to coordinate with the Palm Beach County Solid Waste Authority regarding the management of existing landfill sites, the selection of future landfill sites, and in developing alternative methods of disposing of solid and hazardous wastes.

**Policy 1.2.1:** The City shall continue operating its recycling program on a Citywide basis in order to increase the amount of recyclable material, to reduce solid waste going to landfills by 30 percent between 2008-2018, and to conserve valuable natural resources through reuse of materials.

**Policy 1.2.2:** The City of West Palm Beach shall coordinate with Palm Beach County to ensure that the City is assisting the County with a countywide solid waste collection system to discourage littering and the illegal dumping of solid waste.

**Policy 1.2.3:** The City shall ensure proper notification to its residents and businesses of its collection schedule before and after a major storm event in order to provide appropriate and safe disposal practices.

**Policy 1.2.4:** The City shall control urban sprawl by adhering to the concurrency requirements and level of service standards outlined within this comprehensive plan, including those for solid waste facilities.

**Policy 1.2.5:** The City shall provide additional infrastructure and/or facilities for solid waste collection and transport as it deems necessary to accommodate projected needs.

## STORMWATER MANAGEMENT SUBELEMENT
## GOALS, OBJECTIVES AND POLICIES

**GOAL 1:** THE CITY SHALL PROVIDE ADEQUATE STORMWATER MANAGEMENT FOR PROTECTION AGAINST FLOODING AND TO PREVENT DEGRADATION OF THE QUALITY OF RECEIVING WATERS.

**OBJECTIVE 1.1:** The City shall continue to implement adopted stormwater management regulations which will help to discourage urban sprawl and provide guidelines to prevent the degradation of the water quality of receiving waters. The City shall ensure that future development meets level of service standards and utilizes stormwater management systems compatible with the City's current Stormwater Management Plan.

**POLICY 1.1.1:** The City shall continue to fully implement the stormwater requirements set forth in the Zoning and Land Development Regulations and as specified by the South Florida Water Management District. The City shall continue to implement these regulations in order to meet the following:

a. Maintain and expand the storm management system as needed to maintain level of service design standards of a 3-year, 1-hour storm for the storm-sewer system and a 25-year, 24-hour storm for the canal system.

b. Require erosion and sedimentation controls during construction to avoid contamination of receiving waters.

c. Utilize retention/detention facilities where practical to provide water-quality treatment of stormwater runoff.

d. Install sedimentation basins and/or baffle systems to prevent pollutants from entering receiving water bodies.

e. Maintain the land around Clear Lake and Lake Mangonia in order to prevent stormwater runoff from entering this potable water source.

f. Require future development to limit post-development runoff rates to pre-development discharge rates.

g. Provide routine maintenance to the stormwater management facilities to ensure they are functioning properly and to prolong their service life.

h. Continue the City's vigorous street sweeping program that includes the daily sweeping of downtown streets and twice weekly sweeping of all streets outside of the downtown.

**GOAL 2:** THE CITY SHALL ENCOURAGE COMPACT GROWTH IN THE WESTERN AREAS OF THE CITY AND PROVIDE ADEQUATE STORMWATER MANAGEMENT SYSTEMS WITHOUT DEPLETING THE SOURCE OF IRRIGATION AND RECHARGE WATER.

**Objective 2.1:** The City shall continue to coordinate with the South Florida Water Management District and the local improvement districts to design and implement future stormwater management systems, to conserve wetlands acreage, to foster protection of natural wildlife habitats, to protect natural resources, and to protect water quality.

**Policy 2.1.1:** The City shall maintain the water levels in the City’s discharge canals at beneficial elevations during dry periods to conserve valuable water resources.

**Objective 3.1:** The City shall implement recommendations from the 2016 Stormwater Master Plan, which addresses correcting existing deficiencies and the increasing of capacity to meet future needs.

**Policy 3.1.1:** The City shall address deficiencies and future demand through the Implementation of the 2016 Stormwater Master Plan recommendations and by the implementation of the 1993 Stormwater Utility Ordinance and the Utility Fee to fund designated projects on an ongoing basis.

## NATURAL GROUNDWATER AQUIFER RECHARGE SUBELEMENT
## GOALS, OBJECTIVES AND POLICIES

**GOAL 1:** PRESERVATION AND ENHANCEMENT OF THE AQUIFER IN THE CITY'S WATER CATCHMENT AREA.

**Objective 1.1:** The City shall maintain Comprehensive Plan policies and land development regulations that restrict the encroachment of incompatible land uses upon the water catchment area.

**Policy 1.1.1:** Written objections will be submitted to the City regarding restrictions upon encroachment of potentially-detrimental land uses near the water catchment area. The Water Advisory Committee will analyze and report concerns directly to the City Commission.

**Policy 1.1.2:** Continue monitoring water quality in an effort to identify possible deterioration in water supply quality. Cooperate and participate with other agencies to develop water quality models to more accurately assess the impacts of proposed land use activities.

**Objective 1.2:** The City shall actively pursue acquisition of lands adjacent to the Water Catchment Area and the voluntary dedication of preserves areas in adjacent developed land to maximize natural buffer areas around the perimeter of the Water Catchment Area.

**Policy 1.2.1:** The City shall protect this vital groundwater recharge area and closely regulate development surrounding the Water Catchment Area by allowing only those land uses, site designs, and on-site stormwater drainage systems that are of a benign or beneficial influence to the recharge area.

**Objective 1.3:** The City shall continue to implement a program of public education and information to promote understanding of the Water Catchment Area and the importance of environmental preservation to the quality of the City's water supply.

**Policy 1.3.1:** The City shall continue to develop and utilize the Nature Center facilities and relationships with environmental groups and educational centers to provide an educational program that allows acceptable, passive recreational use of the Water Catchment Area to promote an appreciation of the fragile and unique environment that is the source of the City's water.

**Objective 1.4:** The City shall continue to implement existing and identify additional programs to augment and enhance groundwater recharge.

**Policy 1.4.1:** The City shall continue to implement an aquifer storage and recovery program that will allow the storage of excess water underground which could then be

released during low-flow or drought periods to augment surface waters and water supply requirements.

**Policy 1.4.2:** The City shall continue to implement a water reuse program utilizing reclaimed waste water to recharge surficial wetlands and shallow aquifer systems.

## 10 YEAR WATER SUPPLY FACILITY WORK PLAN SUBELEMENT

## 1.0 INTRODUCTION

### 1.1 Purpose and Objectives

The purpose of the City of West Palm Beach Water Supply Facility Work Plan (hereinafter the 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 2013 Lower East Coast Water Supply Plan (LECWSP) Update was approved by the South Florida Water Management District.

Residents of the City buy their water directly from the City of West Palm Beach Public Utilities Department (PUD). Under this arrangement, the City's PUD ensures that enough capacity is available for existing and future customers and that supporting infrastructure, such as the water lines, are adequately maintained.

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's Work Plan is divided into the following four sections:

Section 1 – Introduction
Section 2 – Background Information
Section 3 – Data and Analysis
Section 4 – Work Plan Projects/Capital Improvement Element/Schedule

### 1.2 Statutory History

The Florida Legislature has enacted bills in the 2002, 2004, 2005, 2011 and 2012 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.

## 1.3 Statutory Requirements

The following highlights the statutory requirements:

1. Coordinate appropriate aspects of its comprehensive plan with the appropriate water management district's regional water supply plan.
2. Ensure that its future land use plan is based upon availability of adequate water supplies and public facilities and services. 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 Planning Division 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 are 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. 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. 373.709(8)(b) and 373.709(2) (a) 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; and
    c. Include a water supply facility work plan for at least a 10-year planning period for constructing the public, private, and regional water supply facility identified in the Element as necessary to serve existing and new development. Amendments to incorporate the water supply facility work plan into the comprehensive plan are exempt from the twice-a-year amendment limitation.
5. Revise the Schedule of Capital Improvements to include any water supply, reuse, and

conservation projects and programs to be implemented during the planning 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).

   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.

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.

8. Address in the EAR, the extent to which the local government has implemented the 10-year water supply facility 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.

## 2.0 BACKGROUND INFORMATION

### 2.1 Overview of the City of West Palm Beach

The City, established in 1894, is the largest municipality within Palm Beach County and serves as the County seat. The City boundaries encompass approximately fifty-eight (58) square miles and are bounded by the Intracoastal Waterway to the east, the South Florida Water Management District C-51 canal to the south, the City's 19.3 square mile Water Catchment Area (WCA) to the west, and the Beeline Highway and 59$^{th}$ Street to the north. Located adjacent to the City are several municipalities including, the Town of Palm Beach, City of Lake Worth, Town of Mangonia Park, and City of Riviera Beach.

Although the City is substantially built-out, approximately 98%, the City population grew from 82,103 in 2000 to 106,525 in 2015, an increase of approximately thirty percent. This population growth is reflective of the fact that the City continues to experience infill and redevelopment within its limits.

In 2007, an evaluation of existing gross acreage by land uses revealed that 28.2% of the total gross acreage in the City is dedicated to residential use. The remaining gross acreages are allocated to non-residential such as recreation/open space (50%); commercial (5.4%); industrial (2.9%); and undeveloped (2%). The City does not anticipate substantial increases in land area in the near future, however population projections indicate a continued modest growth for the City of approximately 25% for the next 20 years to a projected population of 133,502 in the year 2035.

## 2.2 Relevant Regional Issues

As the state agency responsible for water supply in the Lower East Coast planning area, the South Florida Water Management District (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 rulemaking 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 Consumptive 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.

The intent of the City's Water Supply Facilities Work Plan is to meet the statutory requirements mentioned in subsection 1.2 of this plan and to coordinate the City's water supply initiatives with the 2013 Lower East Coast Water Supply Plan (LECWSP) Update, prepared by the South Florida Water Management District.

This Water Supply Facilities Work Plan details the facilities and proposed alternative water supply (AWS) projects that are planned or completed recently and included in the LECWSP in order to assist the City in meeting the service area water demands through 2032. These projects are expected to be completed in increments consistent with the projected growth set forth in the Plan. The AWS projects are included in the City's Capital Improvement Element.

# 3.0 DATA AND ANALYSIS

## 3.1 Service Area - Population Information

The City of West Palm Beach Potable Water Supply Service Area (Utility Service Area) includes the City of West Palm Beach, Town of Palm Beach and Town of South Palm Beach. The existing and future population figures for the Utility Service Area are derived from Palm Beach County Planning, Zoning and Building Department and the University of Florida Bureau of Economic and Business Research (BEBR). Between 1990 and 2000, the Utility Service Area grew from 78,937 to 93,310, an increase of approximately eighteen (18%) percent. In 2008 the City's Utility Service Area population was estimated at 114,982. By 2015, the City's Utility Service Area population increased to 116,250; and in 2035 it is expected to increase to 144,150. This population growth is reflective of the fact that the City continues to experience redevelopment and infill projects within its limits.

## 3.2 Service Area Map

The City Utility Service Area includes the City of West Palm Beach, Town of Palm Beach and Town of South Palm Beach. A copy of the City's Potable Water Supply Service Area map is provided in the Comprehensive Plan Map Series.

## 3.3 Population and Potable Water Supply Demand Projections

This section provides historical population projections from 2008 to 2012 and projected population projections through 2022 for the City Utility Service Area. Population projections for the City and its Utility Service Area are provided by the Palm Beach County Planning Division. The Palm Beach County Planning Division establishes municipal projection figures by

disaggregating county-level forecasts produced by the Bureau of Economic and Business Research (BEBR) analysis of the University of Florida. Palm Beach County projections are prepared in 5 year increments. The City assumed a constant annual growth for each interim year based on the five-annual projections and extrapolated population projections.

### 3.3.1 Historical Population Projections for the Service Area

Historical populations for the City Utility Service Area are as shown below in Table 1. These figures are based on the annual reports prepared by BEBR. The only exception is the 2010(*) number which corresponds to the Census count.

**Table 1 – Historical Population for City of West Palm Beach Water Utility Service Area**

| Year | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| *City of West Palm Beach Population* | 103,663 | 103,150 | 100,343* | 100,801 | 101,668 |
| *Town of Palm Beach Population* | 9,797 | 9,650 | 8,348 | 8,350 | 8,358 |
| *Town of South Palm Beach Population* | 1,522 | 1,523 | 1,171 | 1,174 | 1,212 |
| | | | | | |
| **Total Service Area Population** | **114,982** | **114,323** | **109,862** | **110,325** | **111,238** |

### 3.3.2 Future Population Projections for the Service Area

Future population projections for the City Water Utility Service Area are as shown below in Table 2.

**Table 2– Future Population Projections for City of West Palm Beach Water Utility Service Area**

| Year | 2013 | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|---|
| ***City of West Palm Beach Population*** | 103,038 | 104,630 | 106,525 | 114,718 | 121,381 | 127,401 | 133,502 |
| ***Town of Palm Beach Population*** | 8,168 | 8,170 | 8,041 | 8,234 | 8,425 | 8,753 | 9,138 |
| ***Town of South Palm Beach Population*** | 1,362 | 1,362 | 1,366 | 1,372 | 1,399 | 1,450 | 1,510 |
| ***Total Service Area Population*** | **112,568** | **114,162** | **115,932** | **124,324** | **131,205** | **137,604** | **144,150** |

### 3.3.3 Historical Water Use

The City's Water Treatment Plant historic water production figures are provided below in Table 3 for years 2008 through 2012.

**Table 3–Service Area Historic Water Production and Demand**

| Year | Annual Finished Water Produced at WPB WTP (MGY) | Daily Finished Water Produced at WPB WTP (MGD) | Service Area Population | Per Capita Demand (GPCPD) |
|---|---|---|---|---|
| 2008 | 9,610 | 26.32 | 114,982 | 229 |
| 2009 | 9,960 | 27.28 | 114,323 | 239 |
| 2010 | 9,934 | 27.21 | 109,862 | 248 |
| 2011 | 9,637 | 26.40 | 110,325 | 239 |
| 2012 | 9,225 | 25.27 | 111,283 | 227 |

### 3.3.4 Future Water Demand Projections

Future water demand projections were calculated using the City's service area population projections multiplied by its projected per capita demands. The projected per capita demands are listed as identified in the City's Water Use Permit. Table 4 below provides the projected finished water demand for the year 2013 through 2023. The City's permitted allocation of 15,038 million gallons per year (this includes 4,055 million gallons per year of water produced from alternative water supply sources).

**Table 4–Utility Service Area Water Demand Projections**

| Year | Projected Population | Per Capita Demand (GPCPD) | Projected Annual Demand (MGY) | Permitted Annual Allocation MGY) |
|---|---|---|---|---|
| 2013 | 112,568 | 237 | 9,720 | 15,038 |
| 2014 | 114,166 | 272 | 9,587 | 15,038 |
| 2015 | 116,250 | 272 | 10,333 | 15,038 |
| 2016 | 117,864 | 272 | 10,592 | 15,038 |
| 2017 | 119,478 | 272 | 11,862 | 15,038 |
| 2018 | 121,092 | 272 | 12,022 | 15,038 |
| 2019 | 122,707 | 272 | 12,182 | 15,038 |
| 2020 | 124,324 | 272 | 12,343 | 15,038 |
| 2021 | 125,662 | 272 | 12,476 | 15,038 |
| 2022 | 127,002 | 272 | 12,609 | 15,038 |
| 2023 | 128,342 | 272 | 12,742 | 15,038 |

Permitted annual allocation shown in Table 4 is permitted withdrawal from Clear Lake. Projected population is extrapolated assuming constant annual growth and using the BEBR five year projections. For past years (2013-2016), actual annual demand (MGY) was used to calculate

the per capita demand (GPCPD). For future years (2017-2023) the average projected per capita demand of 272 gallons per capita per day was used for calculating projected annual demand (MGY).

The City's projected annual demand ranges from 9,720 million gallons per year in 2013 to 12,742 million gallons per year in 2023.

Table 5 below summarizes the City's Bulk Service Agreements with local service providers and municipalities. The City has an additional interconnect agreement with Palm Beach County, which is not included as a capacity reservation as this is, by definition, on an emergency basis or subject to system capacity capability at the time of request.

**Table 5 – Bulk Service Agreements Capacity Reservation**

| Bulk Sale Agreements - City of West Palm Beach | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Utility/Agency Served** | | **Quantity of Water (mgd)** | | | | | | | | | |
| | | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** |
| **Solid Waste Authority** | | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| **Palm Beach County-Bayhills** | | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| **Total** | | **0.50** | **0.50** | **0.50** | **0.50** | **0.50** | **0.50** | **0.50** | **0.50** | **0.50** | **0.50** | **0.50** |

The total quantity of water allocated through the bulk service agreements is combined with the City's projected annual demand and compared to the City's permitted annual allocation (based on permitted withdrawal from Clear Lake (this includes 4,055 million gallons per year of water produced from alternative water supply sources)) below in table 6.

**Table 6 – Total Service Area and Bulk Service Agreement Demand Projection**

| Year | Bulk Service Agreements (MGY) | Projected Service Area Annual Demand (MGY) | Total Service Area Demand with Bulk Service (MGY) | Permitted Maximum Allocation (MGY) | Surplus or (Deficit) of Permitted Allocation (MGY) |
|---|---|---|---|---|---|
| **2013** | 182.5 | 9,720 | 9,902.50 | 15,038 | 5,135.50 |
| **2014** | 182.5 | 9,587 | 9,769.50 | 15,038 | 5,268.50 |
| **2015** | 182.5 | 10,333 | 10,515.50 | 15,038 | 4,522.50 |
| **2016** | 182.5 | 10,592 | 10,774.50 | 15,038 | 4,263.50 |
| **2017** | 182.5 | 11,862 | 12,044.50 | 15,038 | 2,993.50 |
| **2018** | 182.5 | 12,022 | 12,204.50 | 15,038 | 2,833.50 |
| **2019** | 182.5 | 12,182 | 12.364.50 | 15,038 | 2,673.50 |
| **2020** | 182.5 | 12,343 | 12,525.50 | 15,038 | 2,512.50 |
| **2021** | 182.5 | 12,476 | 12,658.50 | 15,038 | 2,379.50 |
| **2022** | 182.5 | 12,609 | 12,791.50 | 15,038 | 2,246.50 |
| **2023** | 182.5 | 12,742 | 12,924.50 | 15,038 | 2,113.50 |

Table 7 below identifies Alternative Water Supply Sources (AWS) that can be utilized to meet the City's projected annual service area demand and bulk service agreement reservation. Permitted maximum allocation of 15038 MGY is based on City's permitted allocation for withdrawal from Clear Lake.

**Table 7–Service Area Water Demand Projections and Alternative Water Supply Sources**

| Year | Clear Lake Allocation (MGY) | Renaissance AWS (MGY) | Wetlands Based Water Reclamation AWS (MGY) | Total Service Area Demand with Bulk Service (MGY) | Permitted Maximum Allocation (MGY) | Surplus or (Deficit) of Permitted Allocation (MGY) |
|---|---|---|---|---|---|---|
| 2013 | 15,038.00 | 637 | 1,386.00 | 9,902.50 | 15,038.00 | 5,135.50 |
| 2014 | 15,038.00 | 637 | 1,386.00 | 9,769.50 | 15,038.00 | 5,268.50 |
| 2015 | 15,038.00 | 637 | 1,386.00 | 10,515.50 | 15,038.00 | 4,522.50 |
| 2016 | 15,038.00 | 637 | 1,386.00 | 10,774.50 | 15,038.00 | 4,263.50 |
| 2017 | 15,038.00 | 637 | 1,386.00 | 12,044.50 | 15,038.00 | 2,993.50 |
| 2018 | 15,038.00 | 637 | 1,386.00 | 12,204.50 | 15,038.00 | 2,833.50 |
| 2019 | 15,038.00 | 637 | 1,386.00 | 12.364.50 | 15,038.00 | 2,673.50 |
| 2020 | 15,038.00 | 637 | 1,386.00 | 12,525.50 | 15,038.00 | 2,512.50 |
| 2021 | 15,038.00 | 637 | 1,386.00 | 12,658.50 | 15,038.00 | 2,379.50 |
| 2022 | 15,038.00 | 637 | 1,386.00 | 12,791.50 | 15,038.00 | 2,246.50 |
| 2023 | 15,038.00 | 637 | 1,386.00 | 12,924.50 | 15,038.00 | 2,113.50 |

*AWS Sources C51 (capture of water otherwise released to tide), C17 (capture of water otherwise released to tide) and ASR (Aquifer Storage recovery) are only assumed to be used for 90 days in the year for available water listed. The Wetlands based reclamation AWS (Advanced Wastewater Treatment-AWT) is no longer operational and has been removed from the ECRWRF (East Central Reginal Water Reclamation Facility) permit.

## 3.4 Potable Water Supply System

### 3.4.1 SFWMD Water Use Permit

The City received a twenty year water use permit from the South Florida Water Management District on February 14, 2013. Permit information is as follows:

- WUP Number: 50-00615-W
- Raw Water Source:

  Ground Water from: Floridan Aquifer System and Surficial Aquifer System.

  Surface Water from: Clear Lake via M-Canal and Lake Mangonia from Grassy Waters Preserve and Lake Okeechobee via L-8 Tieback through control 2 (67 MGD).

- Raw Water Allocation Information:

  Annual Allocation: 15,038.00 Million Gallons (MG)

  Maximum Monthly Allocation: 1,392.32 Million Gallons (MG)

Annual allocation includes 15,038.00 Million Gallons (MG) from Clear Lake and 24,446 Million Gallons (MG) from SWFMD Canal (L-8) Tieback as existing surface water withdrawal and from Surficial Aquifer System 1,470 MG from West Wellfield (WWF) and 864 MG from East Wellfield (EWF).

- Specific Source Limitation:

  Clear Lake Annual = 15,038.00 MG; Monthly = 1,392.32 MG

- Permit Expiration: February 14, 2033.

### 3.4.2 Existing Withdrawal Facility

Source: Floridan Aquifer System-Recovery of surface water from Clear Lake stored in the ASR well
1-24" x 1200' x 4861 GPM Well Cased to 985 feet

Source: Surficial Aquifer System
1-18" x 152.5'x 2,780 GPM Well Cased to 82.5 feet
1-18" x 153.5'x 2,780 GPM Well Cased to 83.5 feet
1-18" x 154'x 2,780 GPM Well Cased to 84 feet
1-18" x 163'x 2,780 GPM Well Cased to 93.5 feet
1-18" x 166'x 2,780 GPM Well Cased to 96 feet
1-18" x 170'x 2,780 GPM Well Cased to 100 feet
1-24" x 125' x 1000 GPM Well Cased to 119 feet
4-18" x 150'x 2,780 GPM Well Cased to 80 feet

Ground Water: Surficial Aquifer System -Eastern Wellfield
9-24"x150'x1000 GPM Wells cased to 120 feet.

Source: Clear Lake-Surface Water
4-14" x 100 HP x 8,400 GPM turbine pumps
1-16" x 100 HP x 5,250 GPM centrifugal pumps
2-18" x 125 HP x 10,500 GPM centrifugal pumps
1-30" x 150 HP x 17,500 GPM turbine pump
3-36" x 130 HP x 15000 GPM submersible pumps
4-42" x 200 HP x 33700 GPM axial flow pumps

### 3.4.3 Alternative Water Supplies

The City's Water Use Permit requires the City to "use alternative water supplies to account for all increased demands from Clear Lake above the City's historic use. The City has approved alternatives, urban stormwater treatment via the Renaissance Project (365 MGY), tidal capture from C-51 canal (up to 54 MGD) via Renaissance treatment process, tidal capture from C-17 canal (up to 72 MGD), ASR well (stored surface water-up to 8 MGD), Eastern Wellfield (14.4 MGD), Western Wellfield (24.5 MGD) and Clear Lake Pump station and Divide structure (up to 60 MGD). A discussion of the City's alternative water supply projects can be found in Section

3.6 of this report.

### 3.4.4 Interconnects

The City maintains interconnections with other public water suppliers as follows:

1. One interconnection with the Solid Waste Authority for delivery of up to 0.35 MGD of finished water;

2. One interconnection with the Palm Beach County at Bay Hill Estates for delivery of up to 0.5 MGD of finished water;

3. One emergency interconnection with Lake Worth Utilities (1.0 MGD);

4. Five emergency interconnections with Palm Beach County at SR7 at Okeechobee (3.0 MGD), M-Canal W to Coconut Blvd (0.15 MGD), Haverhill Road (1.5MGD), and Jog Road (3.0 MGD), Florida Mango Rd (1.0 MGD); and

5. Two emergency interconnections with the City of Riviera Beach with one at Military Trail (1.0 MGD) and one at Broadway Avenue (1.0 MGD).

## 3.5 Conservation

The City developed and adopted a Water Conservation Plan in July 2005. The Water Conservation Plan elements include an aggressive approach to the development and implementation of several alternative water supply projects, water conservation based water rate structures, leak detection programs, an irrigation limitation ordinance, native vegetation landscaping requirements, ultra-low volume plumbing fixture construction code, rain sensor override requirement ordinance, and extensive public education programs. The City will coordinate future water conservation efforts with 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 promote 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.

The City's Water Conservation Programs strive to reduce the demand for water in a phased manner that will not only reduce water consumption but reduce utility bills and help to orient people's behavior in a way to conserve resources. The programs address Water and Resource Conservation goals within the City’s Sustainability Action Plan through increasing education and awareness within the community. Conservation programs within the WPB Public Utilities service area include:

- High Efficiency Toilet Vouchers: for both residential and commercial customers, with over 2000 distributed within the 2012 to 2016 period. In 2017 vouchers allow a purchase of up to $125 per voucher.
- Rain Barrel Workshops: average 100 free rain barrels with installation/use trainings per year as of 2016.

- WaterSmart: on line and print customer engagement tool that allows you to track your water usage comparing it to similar households use; reduce your water consumption through timely tips customized to fit your individual profile; save on your monthly water bill while taking advantage of incentives and free offers and learn about utility advancements and Office of Sustainability programs and goals. In 2016, the City launched the pilot program "WPB WaterSmart",15,000 residential pilot participants received Home Water Reports, all utility customers have access to their water consumption information online. The City will be expanding the pilot program to include about 1,500 commercial and multi-family residents in 2017.
- SFWMD WaterCHAMP: a free public education program that helps hotels and motels save water, improve energy efficiency and reduce operating costs using conservation educational placards and high efficiency faucet aerators. West Palm Beach has successfully implemented this program and over 50% of WPB hotels/motels are participating as of 2017.
- Wyland's Mayors Water Challenge: the City has participated annually in this national water conservation education and awareness program. In 2013, West Palm Beach was a winner for cities of our size.
- Sustainability outreach: The Office of Sustainability participates and implements multiple educational conservation programs annually, including E4 Home, E4 Life, E4 Climate, E4 Business/ Green Business Challenge, Imagine a Day without Water, DOE Better Buildings Challenge Water Pilot, Landlord ; Sustainability distributes over 500 water conservation kits per year at events throughout the year which include shower timers, high efficiency shower heads, faucet aerators, and other products.
- The City plans to track monthly water use in City buildings for the U.S. Department of Energy Better Buildings Challenge.
- The City's PACE (Property Assessed Clean Energy) programs include, whenever possible, water and energy savings.

### 3.6 Alternative Water Supply Projects/Reuse

The City is committed to developing and implementing alternative water supply projects involving reuse. In 2002, the City completed the construction of the Renaissance Project, an innovative stormwater collection and reuse system that collects and treats stormwater normally discharged to tide, for reuse by the City in its potable water supply system. The Renaissance Project, a $17,600,000 project was completed with financial support from the Environmental Protection Agency, South Florida Water Management District, and Palm Beach County. The Renaissance Project became operational in September 2002 and it is estimated that between September 2003 and January 2004, over 340 million gallons of stormwater were pumped and treated through the Renaissance Pump Station. The Renaissance Project captures, treat and stores approximately 365 million gallons per year, (MGY) or one (1) million gallons per day (MGD). The Renaissance Project is intended to capture, treat and store stormwater that would normally be lost to tide and reduce the City’s dependency on the regional water supply system.

The City has also completed construction of an 8 mgd aquifer storage and recovery (ASR) well at its Water Treatment Plant. The City’s ASR well is designed to store excess treated surface water during period of heavy rainfall. The excess water is pumped into the upper Floridan Aquifer System and is recovered when the water is withdrawn to meet increased demands during

dry weather. The City's ASR well is under 5th cycle testing to determine the recharge and recovery values and also to evaluate water quality of recovered water.

The existing 10 wells in the Western wellfield can provide 24.5 MGD (operational conditions based on Clear Lake levels and regional water non-availability).

The City completed construction of Divide Structure Pump station on Clear Lake to withdraw water from deeper areas of Clear Lake allowing additional source water of up to 60 MGD (operational conditions based on Clear Lake levels and regional water supply non-availability).

The City just completed construction of 9 more surficial wells located around M-Canal to capture seepage losses, bringing the total number of wells in the eastern Well field to 10 with a potential 14.4 MGD (operational conditions are based on Clear Lake levels and regional water supply non-availability).

The City is in currently constructing a pump station for capturing water sent to tide from C17 Canal, this pump structure has a potential to capture up to 72 MGD (operational conditions based on water being released to tide and canal levels).

## 4.0 WORK PLAN PROJECTS/CAPITAL IMPROVEMENT ELEMENT/SCHEDULE

### 4.1 Existing Water Treatment Plant Process

The City's Water Treatment Plant (WTP) was originally constructed in 1921. In 1894, the WTP was expanded to increase the facility design capacity to 47 million gallons per day (mgd) and in 1999 the City modified their treatment processes to include a ferric sulfate-enhanced lime softening treatment methodology. After a series of bacteriological events in the distribution system in 2007, the plant underwent a series of operational and equipment and process improvements in 2008-2012. Improvements included staff training and augmentation, replacement of inoperable valves, mechanical systems and equipment at the end of its useful life, eliminating gaseous chemicals for staff and public safety, dosing chemicals through a mixing and metering header and modifying control and electrical systems to provide automated plant operation and reliable power distribution as well as backup power generation systems for the plant. The conventional treatment process of coagulation, flocculation/sedimentation, filtration through dual-media, biologically active rapid gravity filters and disinfection with chloramine treatment will be enhanced by the addition of Ultraviolet (UV) light disinfection to provide additional pathogen protection and upgraded taste and odor control. The addition of UV light disinfection process downstream of filters along with a dedicated Powdered Activated Carbon (PAC) contact chamber and new pumping equipment for high service pumping will be under construction in 2016 and this combination of additional treatment was selected as the most economical, environmentally sensitive, energy-efficient and least disruptive option.

The primary source of the City's water supply is surface water. Surface water travels through the City's M-Canal to the City's water supply lakes, Lake Mangonia and Clear Lake, from the City's Grassy Waters Preserve, a 19.3 square mile aquatic preserve located in western West Palm Beach and from Lake Okeechobee through the L-8 Tieback through the City's control 2 structure (pump station upgraded in 2014). Alternative sources of water that feed into this above-ground water supply system include the City's Renaissance Project, tidal water capture from C51 and

C17 Canals, augmentation from surface water stored and recovered from the ASR well, Eastern and Western wellfield surficial wells. During extreme drought conditions Clear Lake Divide structure will help draw water from lower depths in Clear Lake to augment the water supply to the treatment plant.

Source water from Clear Lake is pumped at the intake to the WTP headworks (PAC is added at the intake to control taste and odor) and rapidly mixed with Lime, Ferric Sulfate and polymer, the water is allowed to coagulate, floculate and settle in the sedimentation basins. After readjusting pH with Sodium hydroxide the water is filtered through rapid gravity dual media biological filters and disinfected with chloramination. A corrosion inhibitor and Fluoride is added at the mixing metering header along with final adjustments to pH and chlorine residual. After disinfection, the water is pumped through high service pumps to three major transmission mains that pump to the east, south and north in the City.

The City does not have any self-served areas and doesn't plan on extending service to self-supply customers. The City's Utilities has a dedicated staff in the Sustainability Initiatives division. The Sustainability division runs a number of water conservation programs, including rain barrels, high efficiency toilet voucher program as well as many education programs (details on City's conservation, sustainability and resiliency programs can be found in the conservation section of this document).

## 4.2 Capital Improvements Element/Schedule

The City's financially feasible Capital Improvements Schedule, adopted annually, includes capital improvement projects necessary to maintain levels of service and provide for improved operational facility (See the Capital Improvements Element). The Utilities Department is currently performing/evaluating a condition assessment of the water treatment plant as well as distribution system assets and is in the process of prioritization of infrastructure projects including above ground and underground utilities. Based on the assessment and prioritization, the Utilities Department plans on borrowing money through a bond to address water treatment and distribution system needs.

Upon reviewing the City's projected water demands, permitted allocation and alternative water supply projects, and after extensive long term water supply evaluation and drought proofing measures the City does not anticipate the necessity of additional capacity within the 10 year planning horizon. Nevertheless, the City will continue to explore current technology and options to secure safe water supply to meet anticipated future demands.