COMPREHENSIVE PLAN
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 receive~~s~~ 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 level of service standard for determining the demand and future capacity needs to be generated by a development shall be based on the City's most recent Capacity Analysis Report (CAR) submitted to the Florida Department of Health and developed in accordance with the Florida Department of Environmental Protection's guidelines and Rule 62-555.348, Florida Administrative Code. The level of service standard is 243.3 gallons per capita per day (gpcpd) based on the 2020 CAR submitted in January 2020.

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 not exceed 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 native and Florida friendly plants and efficient irrigation 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 1.3.3: 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 investigate, and, when technically and economically feasible, 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

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.

Objective 1.3: The City shall continue to coordinate with local businesses contracted to haul Fats, Oils, and Grease (FOG) from restaurants and food service establishments and septage according to State Regulations for disposal at the East Central Regional Water Reclamation Facility (ECRWRF).

Policy 1.3.1: All FOG and Septage transporters will be required to obtain an annual written permit from the Department of Health.

Policy 1.3.2: All septage transporters shall comply at all times with Florida Administrative Code (F.A.C) 64E-6, City of West Palm Beach City Ordinance 4414-12, City of West Palm Beach Sewer Use Ordinance 90-126 and 90-128, and ECRWRF Septage Receiving Policy accordingly.

Policy 1.3.3: All FOG transporters shall comply at all times with Florida Administrative Code (F.A.C) 64E-6, City of West Palm Beach City Ordinance 4414-12, and ECRWRF Septage Receiving Policy accordingly.

Policy 1.3.4: The City shall continue to maintain an aggressive Industrial Pretreatment Program (IPP) according to EPA local limits, F.A.C. 62-625, City of WPB Resolution No. 52-12, and City of West Palm Beach Industrial Pretreatment Program Enforcement Response Plan to ensure compliance by local businesses that produce waste.

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.

The work plan reflects the assessments completed as part of the City's 2020 Capacity Analysis Report update that is submitted to the Florida Department of Health in Palm Beach County. The development and submittal requirements for both are based on the following:

- Chapter 403, Part VI, F.S., requiring public water systems to provide for the timely planning, design, permitting, and construction of necessary public water system source, treatment, or storage facilities. Under Chapter 62-555.348, F.A.C., the City is required to prepare and submit an updated Capacity Analysis Report every five years. The 2020 Capacity Analysis Report Update was submitted to the Florida Department of Health in January 2020.

- Chapter 163[1], 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 2018 Lower East Coast Water Supply Plan (LECWSP) Update was approved by the South Florida Water Management District in November 2018.

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

[1] Section 163.3177 (1)e), F.S., When a federal, state, or regional agency has implemented a regulatory program, a local government is not required to duplicate or exceed that regulatory program in its local comprehensive plan.

1.2 Statutory History

The Florida Legislature has enacted bills in the 2002, 2004, 2005, 2011, 2012, 2015 and 2016 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 59th 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 106,893 in 2015 to 115,176 in 2019, an increase of less than eight percent. This population growth is reflective of the fact that the City continues to experience infill and redevelopment within its limits. For future planning purposes, 2020 has been set as the base year for the ten-year and twenty-year planning horizons.

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

1) Recognizing that surface water and ground water is limited, the City has invested in alternative water supplies including Aquifer Storage and Recovery (ASR) well, pump structure at C17 canal and gates at Stub canal and pumps at Renaissance structure for capturing storm water drainage and C51 canal water otherwise lost to tide.
2) The City's water supply permit allocation at Control 2 limits withdrawal based on annual allocation in the permit thus only withdrawing allocated quantity from regional sources.
3) Recognizing that additional storage system may be needed to capture wet season flow volumes, the City constructed an ASR well which is used to pump and capture Clear Lake water during the wet season and stored for use as source water during the dry season.

4) The City's, East Central Regional Water Reclamation Facility and Palm Beach County entered into an interlocal agreement to construct a reclaimed water facility located on the ECRWRF property and operated by the City of West Palm Beach. Currently the City and Palm Beach County have an interlocal agreement to provide reclaimed water to the Fit Team Ball Park of the Palm Beaches for the sole purpose of providing irrigation for the property which is located in the City of West Palm Beach service area.
5) The City at present doesn't use brackish groundwater as source water, however, the City is assessing the possible need for brackish groundwater in the future.

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 2018 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.

The City's watershed, Grassy Waters Preserve, provides flows to Loxahatchee River (one of the two Florida rivers designated as a National Wild and Scenic river) to meet its Minimum Flows and Minimum Water Levels through G161 structure.

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 were developed based on the information obtained from the U.S. Census Bureau, Bureau of Economic and Business Research (BEBR), and data presented in the 2018 Lower East Coast Water Supply Plan Update (LECWSP). Specifically:

- Historical population (2010 through 2018) obtained from the U.S. Census Bureau;
- Population data for years 2010 and 2019 obtained from BEBR website; and
- Population target data for 2040 was obtained from LECWSP.

The population projections are based on the Florida Department of Environmental Protection's "Guidelines for the Preparation of Source/Treatment/Storage Capacity Analysis Reports for Public Water Systems" using the decreasing rate of growth formulas.

The information from the LECWSP's 2040 population for the City's utility service area was used to determine the saturation value (Z) through trial and error until the predicted 2040 population was within 0.2 percent of the LECWS Plan value.

Between 2000 (82,103) and 2015 (116,897) the City experienced a population growth rate of more than forty percent in the City's service area. Between 2015 and 2019 (124,945) the population growth rate in the City's service area dropped to less than eight percent. The continued population growth, although slower, is reflective of the fact that the City's service area continues to experience infill and redevelopment within its limits.

The City does not anticipate substantial increases in land area in the near future, however population projections indicate a continued growth for the City's service area of approximately fifteen percent for the next 20 years to a projected population of 144,525 in the year 2040.

The City's bulk service agreements account for a demand of up to 0.50 mgd and include the Solid Waste Authority and Bayhill Estates. The City anticipates that these agreements will remain in place during the 10-year planning horizon.

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.

A trailer park on Community Drive located in Palm Beach County, but within the City's service area gets water from wells, and currently there is no plan to provide water to this area.

3.3 Population and Potable Water Supply Demand Projections

This section provides historical population projections from 2010 to 2019 and projected population projections through 2020 and 2040 for the City Utility Service Area.

The total population estimates for the City, Town of Palm Beach and Town of South Palm Beach were based on the information obtained from the sources noted in Section 3.1 of the Work Plan.

Use of the FDEP Guidelines to estimate future populations ensures consistency for reporting information to the public and regulatory agencies.

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 U.S. Census data with the exception of the 2019 values which corresponds to the BEBR data.

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

Year	2015	2016	2017	2018	2019
City of West Palm Beach Population	106,893	108,790	110,345	111,398	115,176
Town of Palm Beach Population	8,585	8,690	8,746	8,802	8,321
Town of South Palm Beach Population	1,419	1,433	1,440	1,471	1,448
Total Service Area Population	**116,897**	**118,913**	**120,531**	**121,671**	**124,945**

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 and are extracted from the City's Capacity Analysis Report submitted to the Department of Health Palm Beach County in January 2020.

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

Year	2020	2030	2040
Total Service Area Population	126,305	137,245	144,525

3.3.3 Historical Water Use

The City's Water Treatment Plant historic water production figures are provided in Table 3 for years 2015 through 2019.

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)
2015	10,331	28.30	116,897	242.1
2016	10,589	28.93	118,913	243.3
2017	10,669	29.23	120,531	242.5
2018	10,692	29.29	121,671	240.8
2019	10,586	29.00	124,945	232.1

3.3.4 Future Water Demand Projections

Future water demand projections are estimated using the City's service area population projections multiplied by the per capita factor of 243.3 gallons per capita per day (gpcpd). The per capita factor selected was based on the highest rate over the past five years, consistent with that presented in the LECWSP and was used in the 2020 CAR update. Historically, a baseline per capita factor of 272 gpcpd was used based on the City's Consumptive Use Permit (CUP). Table 4 below provides the projected finished water demand for the years 2020 through 2030.

Table 4 – Utility Service Area Water Demand Projections

Year	Projected Population	Per Capita Demand (GPCPD)	Projected Annual Finished Water Demand (MGY)
2020	126,305	243.3	11,247
2021	127,610	243.3	11,333
2022	128,863	243.3	11,444
2023	130,066	243.3	11,551
2024	131,221	243.3	11,685
2025	132,330	243.3	11,752
2026	133,395	243.3	11,846
2027	134,417	243.3	11,937
2028	135,398	243.3	12,057
2029	136,340	243.3	12,108
2030	137,245	243.3	12,188

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

Utility/Agency Served	Quantity of Water (mgd)										
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
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 from Clear Lake in Table 6 based on a treatment process loss factor of 5 percent.

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

Year	Bulk Service Agreements (MGY)	Projected Service Area Finished Water Annual Demand (MGY)	Total Service Area Finished Water Demand with Bulk Service (MGY)	Total Raw Water Demand* with Bulk Service (MGY)	Permitted Maximum Allocation of Raw Water (MGY)	Surplus or (Deficit) of Permitted Allocation (MGY)
2020	182.5	11,247	11,429.5	12,000	15,038	3038.0
2021	182.5	11,333	11,515.5	12,091	15,038	2947.0
2022	182.5	11,444	11,626.5	12,208	15,038	2830.0
2023	182.5	11,551	11,733.5	12,320	15,038	2718.0
2024	182.5	11,685	11,867.5	12,461	15,038	2577.0
2025	182.5	11,752	11,934.5	12,531	15,038	2507.0
2026	182.5	11,846	12,028.5	12,630	15,038	2408.0
2027	182.5	11,937	12,119.5	12,725	15,038	2313.0
2028	182.5	12,057	12,239.5	12,852	15,038	2186.0
2029	182.5	12,108	12,290.5	12,905	15,038	2133.0
2030	182.5	12,188	12,370.5	12,989	15,038	2049.0

*Raw water demand is based on a 5% loss factor during the treatment process and is calculated by taking 5% of finished water demand and adding it to finished water demand to get the raw water demand.

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 15,038 MGY is based on City's permitted allocation for withdrawal from Clear Lake. For the AWS, C51 canal tidal capture (54 MGD), C17 canal tidal capture (72 MGD) and ASR (2 MGD) each source is assumed to provide water for 20 days based on availability and meeting the water use permit specified canal levels and the requirement of water being discharged to tide. The AWS is not part of the Consumptive Use Permit allocation.

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

	WUP	Alternative Water Supplies				Projection	Surplus
Year	Clear Lake Allocation (MGY)	Renaissance Project (MGY)	C-51 Tidal Capture (MGY)	C-17 Tidal Capture (MGY)	ASR Well Recovery (MGY)	Raw Water Demand* (MGY)	WUP + AWS – Projection (MGY)
2020	15,038.00	637	1,080	1,440	180	12,002	6,373
2021	15,038.00	637	1,080	1,440	180	12,091	6,284
2022	15,038.00	637	1,080	1,440	180	12,208	6,167
2023	15,038.00	637	1,080	1,440	180	12,320	6,055
2024	15,038.00	637	1,080	1,440	180	12,461	5,914
2025	15,038.00	637	1,080	1,440	180	12,531	5,844
2026	15,038.00	637	1,080	1,440	180	12,630	5,745
2027	15,038.00	637	1,080	1,440	180	12,725	5,650
2028	15,038.00	637	1,080	1,440	180	12,852	5,523
2029	15,038.00	637	1,080	1,440	180	12,905	5,470
2030	15,038.00	637	1,080	1,440	180	12,989	5,386

*Raw water demand is based on a 5% loss factor during the treatment process and is calculated by taking 5% of finished water demand and adding it to finished water demand to get the raw water demand.

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: ASR well for surface water storage/recovery 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). All allocations are for the Public Water Supply portion of the permit.

- Specific Source Limitation:

  Clear Lake Annual = 15,038.00 MG; Monthly = 1,392.32 MG
  Surficial Aquifer System West Wellfield (monthly)– 759.50 MG
  Surficial Aquifer System East Wellfield (EWF) (monthly)– 446.4 MG
  SFWMD Canal (l-8) Tieback (monthly)– 2,765.00 MG

- Permit Expiration: February 14, 2033.

3.4.2 Existing Withdrawal Facilities

Source: ASR well for surface water storage/recovery

1-24” x 1200’ x 4861 GPM Well Cased to 985 feet

Source: Surficial Aquifer System-Western Wellfield

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
4-18” x 150’x 2,780 GPM Well Cased to 80 feet

Ground Water: Surficial Aquifer System -Eastern Wellfield

1-24” x 98’x 1000 GPM Well Cased to 95 feet
1-24” x 186’x 1000 GPM Well Cased to 137 feet
1-24” x 181’x 1000 GPM Well Cased to 131 feet
1-24” x 95’x 1000 GPM Well Cased to 91 feet

1-24” x 101’x 1000 GPM Well Cased to 86 feet
1-24” x 170’x 1000 GPM Well Cased to 132 feet
1-24” x 97’x 1000 GPM Well Cased to 93 feet
1-24” x 125’x 1000 GPM Well Cased to 119 feet
1-24” x 195’x 1000 GPM Well Cased to 145 feet
1-24” x 142’x 1000 GPM Well Cased to 105 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 (637 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) and ASR well (stored surface water-up to 8 MGD, though on average have pumped out 2 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 0.15 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 3,422 distributed within the 2012 to 2019 period. In 2019 vouchers allow a purchase of up to $125 per voucher and the program is funded for the period of 2020-2022.

- Rain Barrel Workshops: average 100 free rain barrels with installation/use trainings per year as of 2019.

- 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 2019.

- 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.

- The City plans to continue following implementation of the district's mandatory year-around landscape irrigation conservation measures as detailed in chapter 40E-24 FAC by informing customers through press releases and social media and, if needed, by enforcement through violation fines.

3.6 Alternative Water Supply Projects/Reuse

The City is committed to developing and implementing alternative water supply projects, including reuse, to the extent possible. The City's AWS activities include:

- Renaissance Project: Constructed in 2002, the project is an innovative stormwater collection and reuse system that collects and treats stormwater normally discharged to tide. With an initial construction cost of $17,600,000 the project was completed with financial support from the Environmental Protection Agency, South Florida Water Management District, and Palm Beach County. The system captures, treat and stores approximately 637 million gallons per year, (MGY) or one (1.75) million gallons per day (MGD).

- Aquifer Storage and Recovery (ASR) Well: Upon completion of construction, the ASR well was rated at 8 mgd. Located at the Water Treatment Plant it is designed to store excess surface water during periods 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. Cycle testing continues and in 2019 the well acid cleaned, the injection pump rebuilt, and the effluent valve replaced. The City continues to invest in this alternative water source with plans to restart cycle testing in 2020.

- C17 Canal Pump Structure: The pump station was constructed to capture water prior to being sent to tide from C17 Canal, this pump structure has the 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 West Palm Beach Water Treatment Plant (WTP) is owned and operated by the City of West Palm Beach (City). The WTP and associated distribution system provides potable water to the residents, visitors and business of West Palm Beach and the towns of Palm Beach and South Palm

Beach. The WTP is located in Palm Beach County, Florida at 1009 Banyan Boulevard, West Palm Beach, Florida.

The City was founded in 1894 and has been the seat of Palm Beach County government since 1909. The initial urbanized portion of the City was approximately eight miles long and 3 miles wide. A coastal ridge lies several blocks to the west and runs parallel to the Intercoastal Waterway for the entire length of the City. The original City site now constitutes the central business district. The development and maintenance of the utility infrastructure system continues to provide an acceptable level of service and an essential component in the City's growth.

From the first water supply system developed in the late 1800s, the City's utility system has grown from a service population of approximately 500 people in 1900 to its current estimated service population of approximately 125,000 residents covering 61 square miles. The utility system provides water for both indoor and outdoor use for about 34,334 residential and commercial customers accounts.

The City's potable water system includes a raw water supply system, WTP, repump stations, storage tanks, the distribution system and various interconnections with neighboring utilities.

The City's facilities including the source water supply, water treatment system, re-pump stations, available interconnection and the existing distribution system. Since the 2015 there have been several changes that include:

- Modification of Raw Water Pump #27;
- Construction of the 50.0 mgd Powered Activated Carbon (PAC) Basin;
- Filter Media Replacement;
- Abandonment of the 1 MG Clearwell/Storage Tank at the WTP;
- Construction and Operation of the 50 mgd Ultra-Violet Light (UV) Disinfection System;
- Construction of a direct suction header to the West Pump House;
- Installation of 4 new high service pumps in the West Pump House;
- Remote re-pump station switches from gaseous chlorine to sodium hypochlorite;
- Pre and post disinfectant injection at the Ibis Re-Pump Station; and
- Six Sigma project to address distribution system flushing volumes.

These projects total more than 25 million dollars ($25,000,000) invested in the PWS since 2015. The City continues to be committed to the proper operation and maintenance of its PWS to ensure public health and safety.

The WTP is a surface water treatment facility operating on a source water supply that is collected, stored and transported by various catchment areas including urban rain cropping, wetlands, lakes and canals to meet the water supply needs.

The source water supply includes facilities owned and operated by the City along with facilities within the Regional Systems operated by the South Florida Water Management District and the United States Army Corps of Engineers.

The existing source water supply system dates to 1894 with the construction of a single steam driven pump and an 8-inch pipe to move water from Clear Lake to Henry Flager's Royal Poinciana Hotel. Over the years the source water supply has been expanded. The history of the supply includes the following milestones:

1894	Clear Lake tapped as Water Supply.
1920's	Clear Lake is connected to Lake Mangonia.
1930's	M-Canal excavated to wetlands (Grassy Waters Preserve) west of the lakes.
1950's	Grassy Waters Preserve (19.3 Square Miles) purchased.
1960's	M-Canal Extension westward to the L-8 Canal and Lake Okeechobee.
1980's	Western Wellfield constructed.
1990's	Aquifer Storage and Recovery Well constructed.
2000's	Renaissance Project construction and the Okeechobee Divide Structure constructed.
2010's	Eastern Wellfield constructed, Australian Avenue Gates and Pumps constructed, and the C-17 Pump House constructed.

The Clear Lake WTP, originally completed in 1921, underwent an expansion in 1989 and as of 2020 is in the final steps of a major renovation including the addition of the PAC basins, the UV Treatment System and upgrades to the West Pump House's high service pumps and Raw Water Pump 27.

The WTP has a maximum permitted capacity of 47.3 mgd. The treatment process includes the following:

- Hypochlorite Pretreatment - Turbidity Control (Optional);
- Powered Activated Carbon - Taste and Odor Control (Optional);
- Cationic Polymer - Turbidity Control;
- Ferric Sulfate - Turbidity Control;
- Lime – Softening, Turbidity and TOC Removal;
- Recarbonation - pH Adjustment;
- Filter Aid - Turbidity Control (Optional);
- Conventional/Biologically Active Filters – Turbidity Control, Taste and Odor Control;
- UV Disinfection - Bacteriological Control;
- Chlorine/Chloramines - Bacteriological Control;
- pH Adjustment (Sodium Hydroxide) - Lead and Copper Control;
- Orthophosphate (Corrosion Inhibitor) - Lead and Copper Control; and
- Fluoride - Dental Health.

The WTP uses conventional lime softening, filtration and chemical disinfection to comply with the federal and state safe drinking water regulations. The UV System, commissioned in February 2019, provides an additional barrier for public health purposes. The PAC Basin, expected to be fully operational in early 2020, will be used on an as needed basis to improve the taste and odor characteristic of the finished water.

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.

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.

The Eastern and Western wellfield surficial wells and the Clear Lake Divide structure are available to the City during periods of drought conditions.

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.

- 2022: East High Service Building Motor Control Center. Project includes installation of Variable Frequency Drives on 2 of the 3 existing high service pumps. Project will increase energy efficiency within the plant and provide better control over distribution system pressures.
- 2023: Recarbonation System Upgrades. Project includes replacement of the existing liquid carbon dioxide storage tanks and associated equipment. Project will decrease the plant's potable water demand freeing up capacity for customers and reduce liquid carbon dioxide consumption with an improved process.
- 2025: Kaye Street Re-Pump Station Motor Control Center: Project includes installation of Variable Frequency Drives on the booster pumps. Project will increase energy efficiency within the plant and provide better control over distribution system pressures.
- 2025: Lime Storage/Slaker Additions: Project includes the addition of a new lime silo and slaker. Project will increase lime storage capacity for storm events and slaker capacity for system reliability.
- 2030: Valley Forge Re-Pump Station Storage Tank Upgrade: Project includes the rehabilitation or replacement of the existing 3-million-gallon storage tank. Project will maintain the City's existing storage capacity.

- 2030: Valley Forge Repump Station Motor Control Center: Project includes installation of Variable Frequency Drives on the booster pumps. Project will increase energy efficiency within the plant and provide better control over distribution system pressures.

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.