



2017 City of Orlando Water Supply Facilities Work Plan

SUMMARY

Applicant:

The City of Orlando

Applicant's Request:

Amend Potable Water, Wastewater, Stormwater-Aquifer Recharge, Conservation, and Intergovernmental Coordination Growth Management Plan policies as part of the City's Water Supply Facilities Work Plan update. These amendments will reflect certain local and regional water planning activities.

Public Comment:

Public notice was published in the Orlando Sentinel, as part of the MPB ad. As of the publication date of this staff report on December 12, 2016, no letters, emails or comments have been received.

Staff's Recommendation:

Approval.

Project Planner:

Mary-Stewart Droege, AICP

Updated:

December 12, 2016

Background

In 2005, the Florida Legislature adopted the Florida Water Resources Act. This legislation amended the water supply planning requirements for all jurisdictions. The legislation requires local governments to adopt an updated Work Plan within 18 months of the Water Supply Plan update prepared by the applicable regional water management district. Consistent with Florida State Statute Section 163.3177(6)(C)3, the City of Orlando Water Supply Facilities Work Plan ("Work Plan") serves as a ten year strategic plan to address consumer demand, identify alternative and traditional water supply projects, as well as conservation and reuse activities needed to meet the projected future water demands over a ten year period. As part of this update, the plan and associated GMP amendments must also be reviewed and approved by Orlando City Council, the Florida Department of Economic Opportunity (DEO), as well as St. Johns River and South Florida Water Management Districts prior to May 17, 2017.

Analysis

Last updated in 2008, the current undertaking will include pertinent information and best practices from various sources including the Central Florida Water Initiative (CFWI), Orlando Utility Commission (OUC) and the City of Orlando. The plan builds on past efforts and includes population projections, estimated water demands, regional and local water resources, conservation efforts, as well as an analysis of the existing water delivery infrastructure and future needed 10 year capital improvements.

The City of Orlando is located within the St. Johns River Water Management District and the South Florida Water Management District. In Florida, water planning efforts have been consolidated over the past decade, and in Central Florida, water supply planning is jointly conducted through the Central Florida Water Initiative, which is comprised of South Florida Water Management District (SFWMD), the St. Johns River Water Management District (SJRWMD), the Southwest Florida Water Management District (SWFWMD) and other pertinent agencies. As a result of collaborative efforts, a single, consolidated 2015 water supply plan has been created for Central Florida.

The Central Florida Water Initiative (CFWI) Regional Water Supply Plan (RWSP) was approved by the South Florida Water Management District (SFWMD) Governing Board on November 12, 2015, by the St. Johns River

Water Management District (SJRWMD) Governing Board on November 10, 2015 and by the Southwest Florida Water Management District (SWFWMD) Governing Board on November 17, 2015. The due date for the City's Water Supply Facilities Work Plan update is no later than May 17, 2017. Therefore, this update must be adopted by May 17, 2017.

The proposed GMP amendments are being processed as a large scale amendment to the Official Future Land Use Map in accordance with the requirements of Chapter 163.3184(3), Florida Statutes. As provided in Chapter 163, large scale amendments require two public hearings before City Council and are subject to an expedited state review process by the State Department of Economic Opportunity—Division of Community Planning and other regional agencies.

Attachment A—Water Supply Facilities Work Plan

The Water Supply Facilities Work Plan is designed to serve as a guide for the future expansion of water withdrawal facilities serving the City of Orlando and to promote strategies for the development of sustainable water sources. This Work Plan is based on historical information and projections associated with the City's demographics, water demands, water resources, water delivery infrastructure and water treatment facilities. Appendix A addresses proposed GMP amendments, Appendix B details OUC facilities and permits and Appendix C provides a brief description of the St. Johns River Water Management District and the South Florida Water Management District.

The 10-year Water Facilities Work Plan's key objective is to identify actions that must be taken to ensure that the projected demand for water within the City can be met over a 10-year planning period. Items in the Work Plan include capital projects to ensure infrastructure is in place as well as activities to promote conservation and reuse.

Appendix A —Proposed GMP amendments

The City is required to update and amend certain GMP Potable Water, Wastewater, Conservation, Stormwater and Aquifer Recharge, and Intergovernmental Coordination figures and policies to be consistent with regional and local water supply planning efforts.

FINDINGS

In review of the proposed GMP amendments, it is found that:

1. The proposed amendments are consistent with the State Comprehensive Plan (Chapter 187, Florida Statutes).
2. The proposed amendments are consistent with the East Central Florida Strategic Regional Policy Plan.
3. The proposed amendments are consistent with the provisions of Chapter 163, Part II, Florida Statutes, particularly 163.3177(6)(C)3.
4. The proposed amendments are consistent with the goals, objectives and policies of the City's adopted Growth Management Plan (GMP).
5. The proposed amendments are consistent with the 2015 Central Florida Water Initiative Regional Water Supply Plan.

Recommendation: Staff recommends approval of the proposed GMP amendments.

CONTACT INFORMATION

1. Growth Management: For questions regarding the Growth Management Plan (GMP), please contact Mary-Stewart at (407) 246-3276 or at mary-stewart.droege@cityoforlando.net.

REVIEW/APPROVAL PROCESS—NEXT STEPS

1. MPB minutes scheduled for review and approval by City Council on December 20, 2016.
2. Staff forwards GMP ordinance request to City Attorney's Office in December 2016.
3. 1st reading of the Ordinance in February 13, 2017 (tentative).
4. 2nd reading of the Ordinance in April 10, 2017 (tentative).
5. 31-day appeals period in April-May 2017 (tentative).
6. Ordinance becomes effective in May 2017 (tentative).

As noted above, the schedule is tentative and subject to change.

ATTACHMENT A:
2017 CITY OF ORLANDO WATER SUPPLY
FACILITIES WORK PLAN

2017 WATER SUPPLY FACILITIES WORK PLAN

City of Orlando

Economic Development Department

City Planning Division

December 20, 2016



Table of Contents

EXECUTIVE SUMMARY.....	i
1.0 INTRODUCTION.....	1
2.0 BACKGROUND INFORMATION.....	3
3.0 DATA AND ANALYSIS.....	8
4.0 PROJECTED WATER NEEDS AND SOURCES.....	22
5.0 PROPOSED WORKPLAN.....	22
6.0 APPENDICES.....	27
6.0 A. Appendix A-Proposed GMP Amendments.....	28
6.0 B. Appendix B-Orlando Utilities Commission Facilities and Permits.....	40
6.0 C. Appendix C-Water Management District Information.....	44
FIGURES	
Figure 1. Location Map of the City of Orlando.....	4
Figure 2. Central Florida Water Initiative (CFWI) Map.....	5
Figure 3. CFWI Total Water Needed.....	7
Figure 4. Potable Water Element Policy 1.5.2.....	8
Figure 5. Potable Water Service Area.....	9
Figure 6. Analysis of Water Demand.....	10
Figure 7. Forecasted Total Water Supply Needs and Sources.....	11
Figure 8. Supply and Demand for Reclaimed Water (MGD).....	13
Figure 9. Reclaimed Water Service Areas.....	14
Figure 10. OUC Conservation Results.....	16
Figure 11. Lexington Court is Certified as a Florida Water Star Community.....	18
Figure 12. Ten Year Schedule of Water Supply Projects.....	25

EXECUTIVE SUMMARY

Consistent with Florida State Statute Section 163.3177(6) (C) 3, the City of Orlando Water Supply Facilities Work Plan (“Work Plan”) serves as a ten year strategic plan to address consumer demand, identify alternative and traditional water supply projects, as well as conservation and reuse activities needed to meet the projected future water demands over a ten year period.

As part of this update, the plan and associated Growth Management Plan (GMP) amendments must also be adopted by Orlando City Council by May 17, 2017. The plan is also subject to review by the Florida Department of Economic Opportunity (DEO), as well as St. Johns and South Florida Water Management Districts.

Last updated in 2008, the current undertaking will include pertinent information and best practices from various sources including the Central Florida Water Initiative (CFWI), Orlando Utility Commission (OUC) and the City of Orlando Greenworks Community Action Plan. The Work Plan builds on earlier water related research and includes population projections, water demands, regional and local water resources, conservation efforts, as well as an analysis of the existing water delivery infrastructure and future capital improvements.

The document includes the actions needed to ensure that the projected demand for water can be met over a ten-year planning period. Capital improvement projects such as OUC’s new Ozone Generator Replacement Program and St. Johns River/Taylor Creek Reservoir Water Supply Project will help ensure a healthy and adequate water supply. Also addressed are key conservation and reuse activities, such as OUC Landscape Irrigation Audits and Project Renew as well as the City’s progressive landscaping code and Greenworks guidelines. These programmatic and regulatory activities are anticipated to be essential in safeguarding the Floridan Aquifer, reducing adverse impacts, and meeting future water demands for all users.

The City has been coordinating with a number of the regional and local agencies to meet the goals

of this Work Plan. At a regional level, the St. Johns River Water Management District (SJRWMD) and South Florida Water Management District (SFWMD) work in partnership with the City, OUC and OCUD as it concerns permitting and planning. An important innovation is the establishment of the Central Florida Water Initiative (CFWI) in 2009, which serves as an organizing vehicle for the water management districts and other pertinent agencies to work together to coordinate research, planning and consolidated water supply planning efforts to create a regional water supply plan (RWSP) that details needed water supply projects and activities.

The Orlando Utilities Commission (OUC), provides water to the majority of City residents. OUC also works with the City of Orlando to provide reclaimed water to portions of Orange and Seminole Counties and is the primary contributor to this plan update. Other utilities which generally serve small areas of the City, have also provided important water related information and include the Orange County Utilities Department (OCUD), Taft Water Association and the City of Winter Park Water & Wastewater Utilities Department (WPUD).

OUC, the City’s main service provider, has three strategies to meet future water demands:

- Continue to partner with the City to expand the availability of reclaimed water;
- Maintain an effective conservation program to reduce potable water demand; and
- Partner with the water management districts and local utilities to implement the St. Johns River/Taylor Creek Reservoir Water Supply Project.

Based on the data and analysis, the projected water demands can be met, subject to continued commitment to the water supply projects and conservation/reuse activities outlined in this document.

I.6 INTRODUCTION

The purpose of the City of Orlando Water Supply Facilities Work Plan (Work Plan) is to identify and plan for the water supply and associated facilities needed to serve existing and new development over a ten year period. Chapter 163, Part II, Florida Statutes (F.S.), requires local governments to prepare and adopt Work Plans into their comprehensive plans within 18 months after final approval of the pertinent regional water supply plan(s). This section addresses the Central Florida Water RWS plan approvals, City of Orlando Water Supply Facilities Plan format, statutory history and the associated regulatory requirements.

Overview

In Florida, water planning efforts have been consolidated over the past decade, and in Central Florida, water supply planning is jointly conducted through the Central Florida Water Initiative, which is comprised of South Florida Water Management District (SFWMD), the St. Johns River Water Management District (SJRWMD), and South-West Florida Water Management District (SWFWMD) and other pertinent agencies (See <http://cfwiwater.com/>). As a result of collaborative efforts since 2009, a single, consolidated water supply plan has been created for Central Florida.

The Central Florida Water Initiative (CFWI) Regional Water Supply Plan (RWSP) was approved by the South Florida Water Management District (SFWMD) Governing Board on 11/12/15, by the St. Johns River Water Management District (SJRWMD) Governing Board on 11/10/2015 and by the South-West Florida Water Management District (SWFWMD) Governing Board on 11/17/15. The due date for the City's Water Supply Facilities Work Plan update is no later than 5/17/17.

The City of Orlando is situated within the SJRWMD and SFWMD jurisdictions, which address and manage a broad range of regulatory water reviews and

permits. While the City of Orlando and its residents generally obtain water from the Orlando Utilities Commission (OUC), some water is also supplied by other local utilities, including Orange County Utilities Department primarily in south-east Orlando, and by the City of Winter Park Water and Wastewater Utilities Department to a small number of properties in north Orlando.

Key to the current update, the Work Plan must address the development of traditional and alternative water supplies, service delivery as well as conservation and reuse programs necessary to serve existing and new development for at least a 10-year planning period.

The Plan is divided into six general sections, including appendices:

Section 1—Introduction

Section 2—Background Information

Section 3—Data and Analysis

Section 4—Projected Water Needs and Sources

Section 5—Proposed Work Plan

Appendices include proposed GMP amendments, OUC support materials, and water management district information.

Statutory History

The Florida Legislature enacted bills in the 2002, 2004, 2005, and 2011 sessions to address the state's water supply needs. These bills, in particular Senate Bills 360 and 444 (2005 Legislative Session), significantly changed Chapters 163 and 373, 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.

It should be noted that amongst this legislation was the landmark 2004 Wekiva Parkway and Protection Act, as well as the 2005 Florida Waters Resources Act, which served as the basis for the City of Orlando's first water supply plan in 2006. In addition, these bills established the platform for improving coordination between local land use planning and water supply planning.

Statutory Requirements

The City of Orlando has considered the following statutory provisions while updating the Water Supply Facilities Work Plan (Work Plan):

1. Coordinate appropriate aspects of the City's Growth Management Plan (Comprehensive Plan) with the Central Florida Water Initiative Regional Water Supply Plan [163.3177(4) (a), F.S.].
2. Ensure the City's future land use plan is based upon availability of adequate water supplies as well as public facilities and services [s.163.3177 (6) (a), F.S.]. In particular, data and analysis demonstrating that adequate water supplies and associated public facilities are available to meet projected growth demands and that they are included in each of the Planning Division staff reports addressing proposed Future Land Use Map amendments that increase allowable density and intensity.
3. Ensure that adequate water supplies and potable water facilities are available, through the City's Permitting Division development review process, no later than the issuance of a certificate of occupancy (CO) and, if necessary, consult with the applicable water supplier to determine whether adequate water supplies will be available to serve the development by the anticipated issuance date of the certificate of occupancy [s.163.3180 (2), F.S.].
4. Address, as part of the regional and local water supply plan updates, revisions to the Potable Water Element and, if applicable, to the Wastewater, Conservation, Stormwater and Aquifer Recharge Elements to:
 - i. Identify and incorporate the alternative water supply project(s) selected by the local government from projects identified in the Central Florida Water Initiative Regional Water (CFWI) Supply Plan or alternative project(s) proposed by the local government as detailed under s.373.709(8)(b), F.S. [s. 163.3177 (6)(c), F.S.];
 - ii. Identify the traditional and alternative water supply projects as well as the conservation and reuse programs necessary to meet water needs identified in the CFWI Regional Water Supply Plan [s. 163.3177(6)(c) 3, F.S.]; and
 - iii. Update the Work Plan for at least a 10-year planning period to address the construction of public, private, and regional water supply facilities, as necessary, to serve existing and new development [s. 163.3177(6)(c) 3, F.S.].
5. Revise the Five-Year Schedule of Capital Improvement Element to include water supply, reuse, and conservation projects and programs to be implemented during the five-year period [163.3177(3)(a)4, F.S.].
6. Maintain, as necessary, internal consistency after making changes, as described in Paragraph 1 through 5 and address the following:
 - i. Revise the Potable Water Element to include projected water needs and sources for at least a 10-year planning period, considering the CFWI Water Supply Plan, as well as applicable consumptive use permit(s) [163.3177 (6) (d), F.S.].
 - ii. Update the Intergovernmental Coordination Element to ensure coordination of the GMP with the CFWI Regional Water Supply Plan [s.163.3177 (6) (h) 1., F.S.].
 - iii. Through the Evaluation and Appraisal Report (EAR) process provide direction in updating the Growth Management Plan to address, where pertinent, water supply planning including the development of alternative water supplies, and determine whether the identified alternative water supply projects, traditional water supply projects, and conservation and reuse programs are meeting local water use demands [s.163.3191 (3), F.S.].

2.0 BACKGROUND INFORMATION

Included in this section is a brief overview of the City of Orlando, including information on land use, population, socio-economic data and water utility characteristics. The latter part addresses the Central Florida Water Initiative (CFWI) Regional Water Supply Plan (RWSP), and some key findings and implications for the City and utility providers in their water management practices.

Socio-Economics

Since its incorporation in 1875, the City of Orlando has grown significantly in terms of land area, population, as well as employment and influence, in the Central Florida region. At the date of incorporation, Orlando was comprised of a one square mile area with a population of about 100 persons. The pace of growth fluctuated in the pre-war period only to gradually accelerate with the establishment of the Martin Marietta Orlando Plant to support the John F. Kennedy Space Center in the early 1960's, followed by the opening of Walt Disney World in 1971.

Since then the population growth has steadily increased with only a brief downturn in the early 1990's with the closing of the Orlando Naval Training Center. Orlando, "The City Beautiful" is one of the fastest growing cities in the nation, as a regional hub for both finance and business and as an international destination with the 13th busiest airport in the US.

Offering an outstanding quality of life with a warm climate and a variety of world class cultural, educational and natural amenities, the approximately 114 square mile City is characterized by distinctive neighborhoods and unique main street districts. Over the past several decades expansion has been focused in the south-east as evidenced by the rapid growth in the Lake Nona Development of Regional Impact (DRI) area as well as a number of strategic annexations, including Vista Park and Starwood.

More recently, there has been a significant investment in downtown housing, amenities and businesses. This is evidenced by the internationally acclaimed Dr. Phillips Performing Arts Center, Amway Center and the 68 ac. mixed-use Creative Village, which includes the emerging University of Central Florida's Downtown Campus.

As detailed in the 2010 Census, Orlando has diverse population that is 57.6% white, 28.1% black, 7.5% Asian and 6.8% other. A full 25.4% of the population describe themselves as Hispanic. A young population with a median age of 32.8 years, the average household size is 2.64. The majority of residents rent rather than own, with 39.5% owner occupied units and 60.5% renter-occupied units.

Situated within Orange County, Orlando is strategically sited in Central Florida, a region that includes seven counties: Orange, Seminole, Lake, Brevard, Volusia and Polk and Osceola. In 2015, the region had a population of 4,025,455 (BEBR), Orange County had a population of 1,252,396, while the City's population for the same time period was 262,372.

As the largest incorporated City in Central Florida, Orlando represents approximately 6.5% of the Central Florida population and 21% of the total Orange County population.

The City's growth projections indicate that by 2045, the City will have approximately 376,500 residents while Orange County will have grown to 2,004,000. The City's population share is also expected to drop to 18.7%.

By 2045, it is estimated that Central Florida region will have grown to 5,935,900 or by 67%. These projections also indicate that the City's portion of growth of the Central Florida area will be less than 6% and while substantial, Orlando will become an even smaller proportion of the total Central Florida population.

The growth in population will have important implications for water supply planning. According to OUC, approximately 95 percent of the City's population, and an estimated 90 percent of the City's land area, is located within the OUC service area. (See page 11-12 for discussion of the Utility Providers and Service Map on page 9.)

Coordination and balancing of local and regional interests will be key in equitable water management, as discussed in the next section.

Location Map of the City of Orlando

June 2016

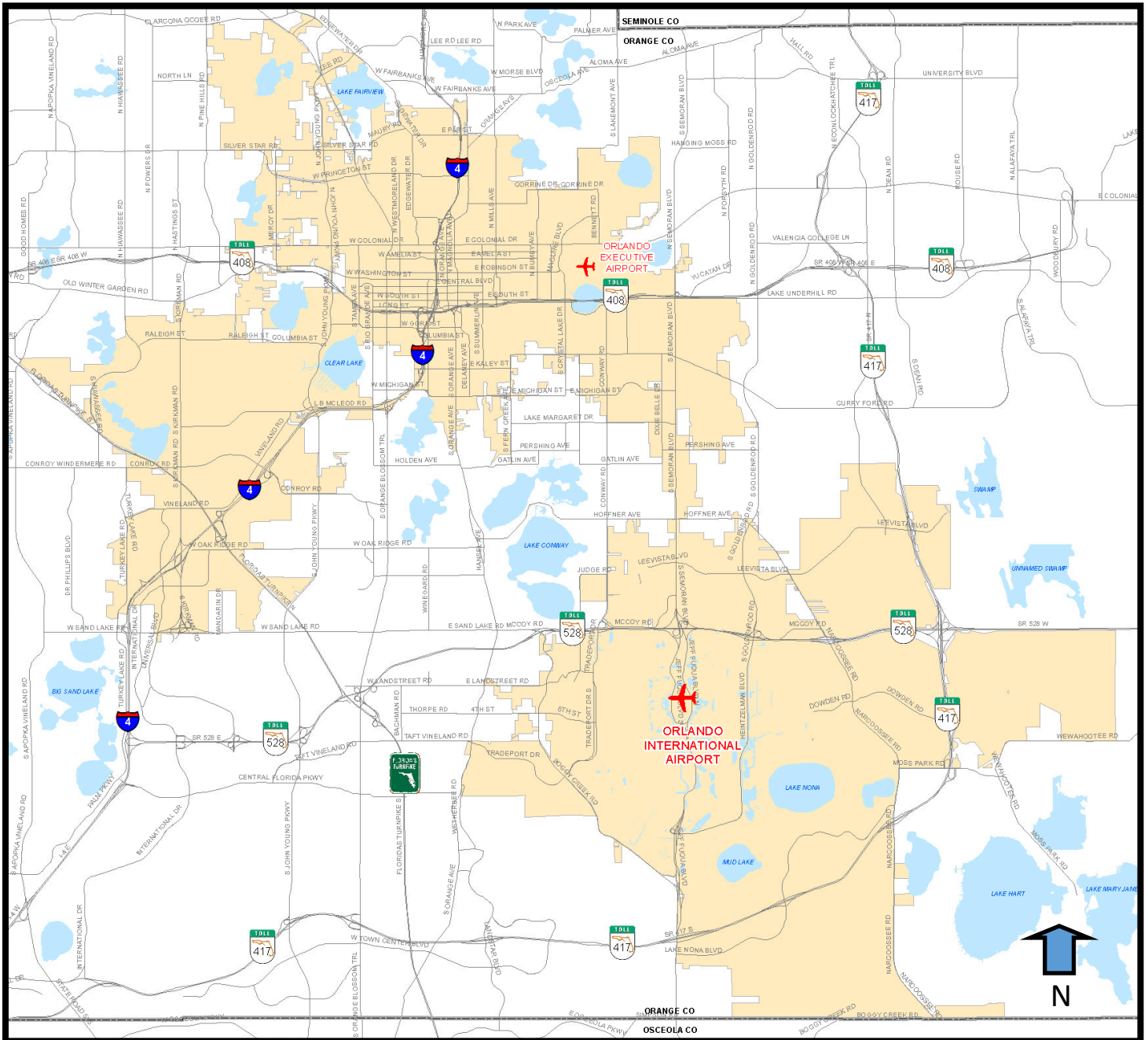


Figure 1.

Central Florida Water Initiative (CFWI)

Overarching regional principles and issues as identified by the Central Florida Water Initiative (CFWI) planning efforts, have significant local implications. Formed in 2009, the CFWI has made enormous progress in a short period of time to better coordinate planning efforts and resources.

As discussed in Section 1.0, the water management districts are required to develop regional water supply plans to identify sustainable water supply for all water uses while protecting water resources and related natural systems. Through the Central Florida Water Initiative, St. Johns River Water Management District (SJRWMD), South Florida Water Management District (SFWMD) and the Southwest Florida Water Management District (SWFWMD) are working collaboratively, with other agencies and stakeholders, to implement effective water resource planning, including water resource and supply development and management strategies to protect, conserve and restore important water resources. (For additional information on St. Johns River and South Florida Water Management Districts, and their various activities, please see Appendix C).

The CFWI Planning Area includes all of Orange, Os-

ceola, Seminole and Polk counties as well as southern Lake County. Using a unified process to address Central Florida's current and long-term water supply needs, the key principles of the CFWI, as contained in the CFWI Guiding Document, are:

- ◇ *Identify* the sustainable quantities of traditional groundwater sources available for water supplies that can be used without causing unacceptable harm to water resources and associated natural systems.
- ◇ *Develop* strategies to meet water demands that are in excess of the sustainable yield of existing traditional groundwater sources. These strategies may include optimizing the use of existing groundwater sources, implementing demand management, and identifying alternative water supplies that can be permitted and will be implemented, as demands approach the sustainable yield of existing sources; and
- ◇ *Establish* consistent rules and regulations for the three water management districts that meet their collective water management goals and implement CFWI directives.

Consistent with the stated principles, the goals of CFWI include developing: a unified water management water management model, a uniform definition of harm, as well as a coordinated minimum

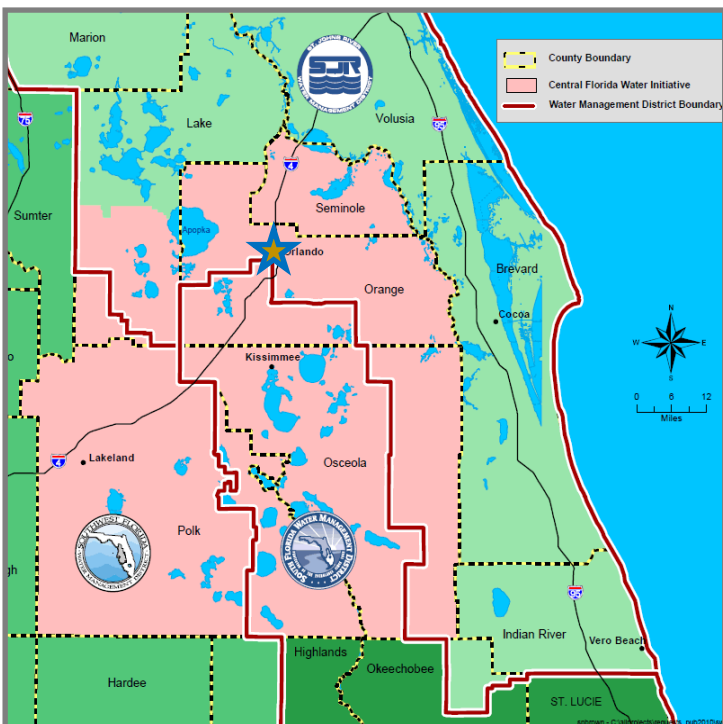


Figure 2. CFWI Map

The City of Orlando, identified by a blue star, is located within portions of the St. Johns River Water Management District (SJRWMD) and the South Florida Water Management District (SFWMD).

The Central Florida Water Initiative (CFWI) subject area (in pink) includes St. Johns River Water Management District, the Southwest Florida Water Management District and South Florida Water Management District (boundaries outlined in red).

Through this collaborative initiative, WMDs work to implement water resource planning to protect, conserve and restore Florida's water resources.

flow levels (MFLs) and the permit review process. One goal that has recently been achieved is a coordinated regional water supply plan, which addresses needed recovery and prevention strategies. The 2015 CFWI RWSP updates the three district water supply plans that address the CFWI area. The planning horizon is through 2035 and a key part of the plan is to identify water conservation measures, water supply project options, and water resource development project opportunities.

Key CFWI Water Management Issues

The recent CFWI Regional Water Supply Plan (RWSP) findings, concluded that traditional groundwater resources alone cannot meet future water demands or currently permitted allocations, without resulting in unacceptable impacts to water resources and related natural systems. In particular, the rate of groundwater withdrawal in certain areas of the CFWI Planning Area is either rapidly approaching, or has surpassed, the maximum rate, that can be sustained without causing harm or adverse impacts to the water resources and related natural systems.

Primary areas of impact that are more susceptible to the effects of groundwater withdrawals, associated with projected demands through 2035, include the Wekiva Springs/River System, western Seminole County, western Orange County, southern Lake County, the Lake Wales Ridge and the Upper Peace River Basin. Some notable and historic water systems in these jurisdictions include Green Swamp, Reedy Creek Swamp, Boggy Creek Swamp, Shingle Creek Swamp, the Kissimmee Chain of Lakes, 16 springs and a large number of wetland and surface water bodies.

In Orlando, which contains portions of the Wekiva Protection area, there are over 100 spring fed lakes and extensive wetland systems. In the City's newly developing areas of the south-east, conservation tracts have been established to protect the native habitat and improve the quality of the community's natural and built systems.

Of importance to the present effort is that total water demands by all water use categories are projected to increase from an *average total water*

use of approximately 800 millions of gallons per day to almost 1,100 mgd in 2035 in CFWI area. It has been estimated that the planning area could sustain an additional 50 mgd of traditional groundwater use but coordinated management strategies will be needed, and even with mitigation, will result in 250 mgd deficit.

Water User Characteristics and Sources

As detailed in the CFWI plan, public water supply constitutes the largest water use in the region. CFWI estimates that as of 2014-15, there was an estimated 2.7 million people in the planning area, which is projected to reach 4.1 million by 2035. Other users include a large international tourist industry, commercial and industrial activities, as well as the agricultural sector. CFWI reports that agriculture represents the second largest user, and while overall acreage is projected to decline due to urbanization, crop intensification is anticipated to increase and water demands, without proper management, may also rise.

Current water sources in the CFWI Planning Area include groundwater, reclaimed water, surface water, and stormwater. Fresh groundwater sources which include surficial, intermediate, and Floridan aquifers, are considered traditional water sources whereas nontraditional or "alternative" water sources include brackish groundwater, surface water, seawater, reclaimed water, and water stored in aquifer storage and recovery wells and reservoirs.

Traditionally, groundwater from the Floridan aquifer has been used as the primary source of water for industrial, agricultural and urban uses. Currently, it is estimated that over 90% of the treated wastewater is used for landscape irrigation, industrial uses, groundwater recharge and other applications.

Modeling Tool and Limitations

Given growing demand, CFWI has identified the need to have a single unified tool to effectively evaluate water withdrawals and impacts on water resources and natural systems. Accordingly, CFWI hydrological modeling has been performed and results have been used to evaluate various water-

use scenarios.

While useful, the modeling evaluated groundwater withdrawals are only currently employed for planning efforts and not for district specific water use permits. Accordingly, at St. Johns River and South Florida Water Management Districts, water-use permitting decisions continue to be made with broad-based information that is site-specific and which, may consider opportunities for water resource development, management strategies, and mitigations of impacts.

CFWI Minimum Flows and Levels (MFLs)

CFWI minimum flows and levels have been established for 46 water bodies in the CFWI area, fully within the SJRWMD and SFWMD. There are 10 water bodies below established MFLs and an additional 15 water bodies that are projected to fall below the established MFLs during the planning period, if demand is to be met from traditional sources.

In addition, water levels in regulatory monitoring wells in the Lake Wales Ridge area are also projected not to be met by 2035. Prevention and recovery strategies are being implemented to address future deficits.

Wetlands have also been analyzed and stressed systems are typically due to multiple factors, including groundwater withdrawals. Mitigation is introduced on a case-by-case basis.

Water Quality

The risk of water quality change for select wellfields has been identified in the eastern portion of the CFWI Planning Area. Water quality issues are typically addressed through the management of wellfield operations. While there is increased potential for risk for water quality changes, CFWI finds that at present they are manageable through wellfields operations.

Water Conservation

Water conservation by all water users will continue to be a priority to meet the region's future water needs. Initial evaluations estimate that an additional 42 mgd could be saved with increased con-

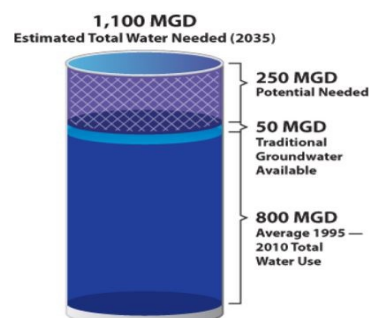
servation interventions. Research shows that water savings are influenced by voluntary consumer actions, level of conservation education, financial incentives, passive savings and assumed participation rates in conservation best management practices.

Several sources of water and storage options were considered to address future water needs. The CFWI RWSP identifies 150 potential water supply project options, a number of which may impact the City of Orlando. The list of interventions includes 37 brackish/nontraditional groundwater, 87 reclaimed water, 17 surface water, 6 stormwater and 3 management strategies. Cumulatively, the 150 water supply project options have the capacity to generate up to 505 mgd, exceeding the estimated future need of 250 mgd.

In addition, potentially 122 mgd of raw surface water may be available. Funding for the development of alternative water supplies is primarily the responsibility of water supplies and users with potential funding assistance from the State of Florida and Water Management Districts.

2.2.7 Uncertainty

CFWI reports that uncertainty is inherent in water resource analyses. At a regional level, the best strategy for dealing with uncertainty is the implementation of increased water conservation and a suite of water supply sources and ample supply project options. Projects identified in the CFWI are options from which local governments, such as the City of Orlando, utilities, such as OUC, and others may choose. Public and private partnering can ensure that water resources in the CFWI Planning Area are appropriately managed.



**Figure 3. CFWI-
Total Water
Needed**

3.0 DATA AND ANALYSIS

This section describes projected population growth, associated water demand and level of service (LOS) standards as well as the nature and extent of provider supply services and strategies.

This data is used as part of the City’s GMP amendment facility analysis, typically with an associated increase in development density and/or intensity to confirm that there is an adequate level of service. Amendments are then submitted to pertinent regulatory agencies for review and approval.

Population Overview

Population characteristics were addressed in the Section 2.0 Background Information. An estimated 95% of the City’s population is served by the Orlando Utilities Commission. Other service providers include Orange County Utilities and City of Winter Park Utility serve the remainder.

The population estimates and projections and the potable water demand are discussed on page 11 and is shown in a series of tables on page 10.

Current and Future Service Areas

On the next page, the Potable Water Service Area map depicts current and future City of Orlando boundaries and utility providers.

Potable Water Level of Service Standards (LOS)

Potable Water Element Policy 1.5.2, shown below, identifies LOS standards according to land use. The level of service standards are based on the amount of physical capacity necessary for water provision by land use and historic water sales. Actual demand may vary.

The City projections are conducted for each traffic analysis zone (TAZ) within Orlando, allowing demand to be analyzed by each separate service provider. Demand is calculated for an average day, in millions of gallons per day (MGD). Reclaimed and potable water are not separated in the analysis .

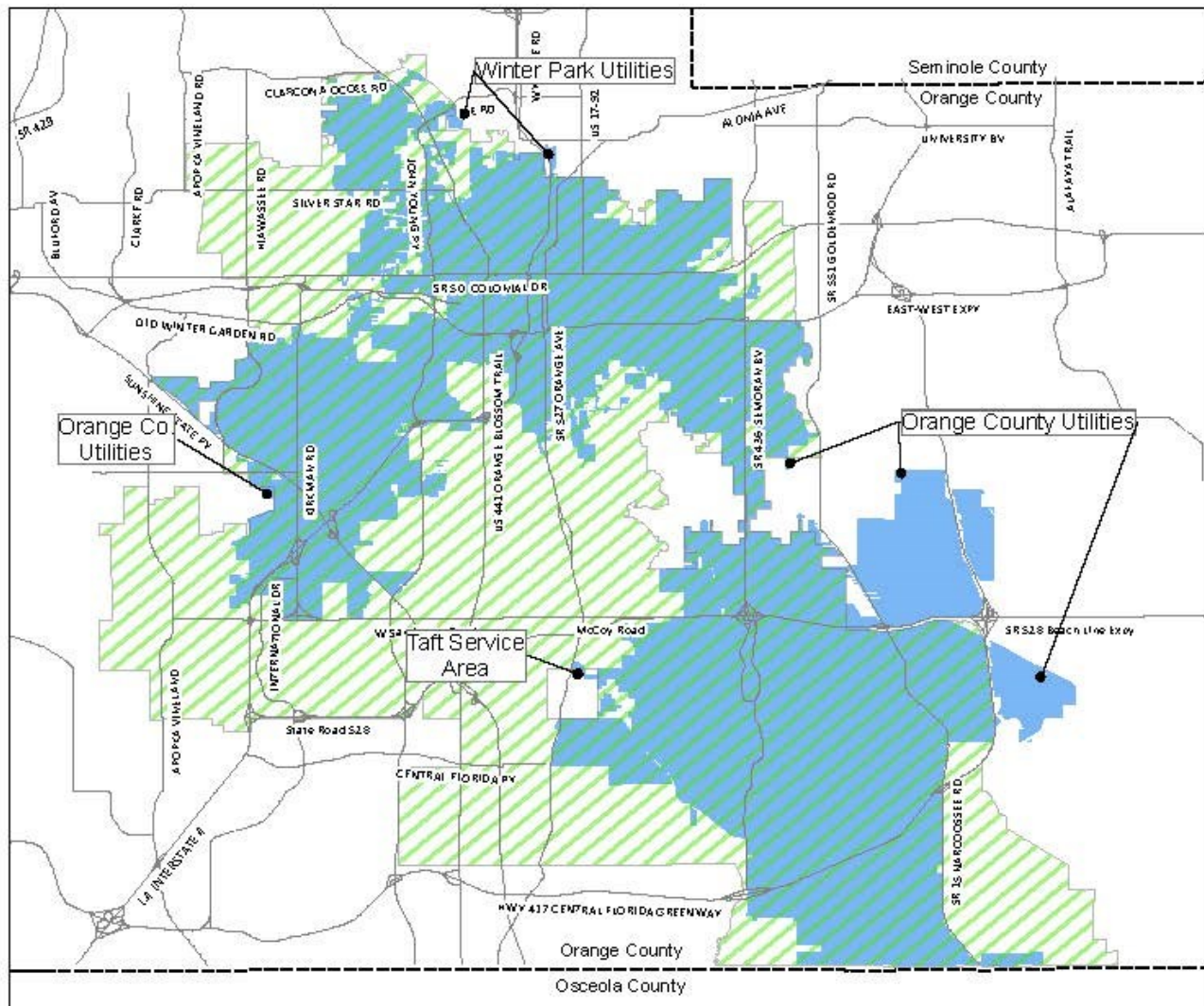
Charts on page 10 show City generated projections through to 2045, addressing demand by future land use as well as population projections and water demand for each utility provider. The LOS standards are applied across the City, without distinguishing service provider. Per discussion with OUC, technical data supports the adopted LOS standards. No LOS revisions are contemplated as part of this update.

It should noted that the City demand projections in Figure 6 are different from the OUC demand projections in Figure 7. The City uses the level of service (LOS) multipliers to project water demand while OUC’s results are based on entire service population and user characteristics.

Figure 4.

Policy 1.5.2 The City shall use the following Levels of Service in its evaluation of future potable water infrastructure service:		
<u>Land Use</u>	<u>LOS Without Reclaimed Water</u>	<u>LOS With Reclaimed Water</u>
Single-Family	325 g/du/d	160 g/du/d
Multi-Family	200 g/du/d	200 g/du/d
Office	0.15 g/sqft/d	0.15 g/sqft/d
Commercial	0.13 g/sqft/d	0.13 g/sqft/d
Hotel	187 g/rm/d	187 g/rm/d
Industrial	0.22 g/sqft/d	0.22 g/sqft/d
Government	0.15 g/sqft/d	0.15 g/sqft/d
Hospital	0.22 g/sqft/d	0.22 g/sqft/d
<u>Design Flow</u>	<u>Pressure</u>	
Average Day	50 psi	
Peak Day	40 psi	
Peak Day plus Fire	25 psi	
These LOS shall be based on the average day demand.		

Potable Water Service Area



LEGEND

0 1.5 3 Miles

- Roadways
- OUC Water Service Area
- Orlando City Limits



Figure 5.

2015

Figure 6: City of Orlando: Analysis of Water Demand

Figure 6i: Land Use Category	Level of Service: Gallons per unit per day	Cumulative Demand (Millions Gallons per Day)						
		2015 (Baseline)	2020	2025	2030	2035	2040	2045
Single Family	325	13.19	13.88	15.08	16.01	16.81	17.56	18.14
Multifamily	200	17.29	19.52	21.25	22.41	23.40	23.99	24.50
Office sq. ft.	0.15	5.34	5.68	6.21	6.74	7.08	7.27	7.42
Commercial sq. ft.	0.13	3.99	4.37	4.77	5.05	5.19	5.28	5.33
Hotel rooms	187	3.99	4.38	5.01	5.50	5.79	5.89	5.92
Industrial sq. ft.	0.22	9.52	9.87	10.58	11.12	11.66	12.01	12.31
Government sq. ft.	0.15	2.84	3.27	3.60	3.86	4.06	4.11	4.17
Hospital sq. ft.	0.22	1.46	1.49	1.66	1.83	1.88	1.98	1.99
Total demand		57.60	62.47	68.16	72.53	75.88	78.10	79.77

Figure 6ii. Water Provider	Baseline Population	Population Growth					
	2015	2020	2025	2030	2035	2040	2045
Orange	10,411	3,804	7,696	6,113	6,242	5,291	4,542
OUC	251,733	25,981	18,569	13,166	10,089	6,730	5,226
Winter Park	228	5	284	0	0	0	0
Incremental	262,372	29,790	26,549	19,279	16,331	12,021	9,768
Cumulative	262,372	292,162	318,711	337,990	354,321	366,342	376,110

Figure 6iii. Water Provider	Baseline	Water Demand (Gallons per Day)					
	2015	2020	2025	2030	2035	2040	2045
Orange	1,480,011	567,040	1,127,397	810,350	893,775	727,150	610,900
OUC	56,039,998	4,294,707	4,541,492	3,529,894	2,467,905	1,481,735	1,058,220
Winter Park	84,300	(631)	26,825	23,940	-	-	-
Incremental	57,604,309	4,861,115	5,695,714	4,364,184	3,361,680	2,208,885	1,669,120
Cumulative	57,604,309	62,465,424	68,161,138	72,525,322	75,887,002	78,095,887	79,765,007

Water Providers

The following briefly describes the various utilities that serve the City.

Orlando Utilities Commission (OUC)

In 2015, OUC provided water to approximately 251,000 City residents. OUC's total service population in 2015 was approximately 426,737 residents. As of 2015, average daily demand was approximately 82.4 MGD (See table below).

By 2030, OUC expects average daily water demand to grow to 108.6 MGD. The permitted capacity of OUC's existing groundwater supply and treatment facilities would allow for distribution of up to 121.2 MGD on an average day basis. (See Appendix B, which describes the facilities and infrastructure provided by OUC.)

OUC's Consumptive Use Permit (CUP) limits the amount of water that OUC may withdraw from the aquifer. OUC's CUP (#3159) allows OUC to withdraw up to 109.2 million gallons per day (MGD) of groundwater by 2023, if a regional reuse project is implemented that offsets drawdown impacts from groundwater withdrawals. If a reuse project is not implemented, OUC's CUP will expire in 2021 with an allocation of 100.1 mgd.

OUC has three strategies to meet future water demands:

- Continue to partner with the City to expand the availability of reclaimed water;
- Maintain an effective conservation program to reduce potable water demand; and
- Partner with water management districts and local utilities to implement the Taylor Creek Reservoir Project.

Figure 7. Forecasted Total Water Needs and Sources Orlando Utilities Commission (OUC)	Demand Projection or Available Supply (MGD, AADF)			
	2015 Baseline	2020	2025	2030
Supply or Demand Component				
OUC Potable Water Demand - Total Service Area ⁽¹⁾	82.4	94.6	102.4	108.6
OUC Reclaimed Water Demand - Total Service Area ⁽²⁾	11.6	13.7	15.6	16.7
Total Water Demand - Total Service Area	94.0	108.3	118.0	125.3
Total Water Demand - in City of Orlando ⁽³⁾	55.5	63.9	69.6	73.9
Groundwater Supply Available ⁽⁴⁾	105.0	109.2	109.2	109.2
Reclaimed Water Supply (City/County w/o golf courses) ⁽⁵⁾	20.9	20.7	20.5	21.9
Surface Water Supply Available (SJR/TCR Project)	0.0	0.0	0.0	5.0
Water Conservation Rebates (Demand Reduction Amount)	0.5	1.0	1.5	2.0
Total Supply Available	126.4	130.9	131.2	138.1
Forecasted Supply Surplus - Total OUC Service Area	32.4	22.6	13.2	12.8
(1) Projections taken from Table A-1 of 2015 Final CFWI RWSP, Volume IA. Based on BEBR medium scenario for 5-in-10 year rainfall. Projections based on a 1-in-10 year rainfall, which increase demands by 6%, are also provided in the RWSP.				
(2) Based on reclaimed water demands for OUC service area per Carollo reclaimed water model update for the City in 2016 without golf courses and adding in County estimated demands in OUC service area without golf courses. It is assumed there will be a maximum demand of 3 mgd for OUC customers served by Orange County utilities.				
(3) Assumes 59% of OUC demand is in City of Orlando based on the proportion of City population to total OUC population in 2015.				
(4) Groundwater supply available is assumed to be limited by permit allocation or facility capacity, whichever is less. OUC CUP expires in 2023. Allocation for 2025 and 2030 is assumed to remain the same as the allocation at the end of the permit duration.				
(5) Reclaimed water supply available to OUC includes a maximum of 3 mgd from the County and the low range supply projections for Iron Bridge, CI, and CII with non-OUC demands, golf courses, and minimum wetlands flow and CII RIB flow subtracted. {Table provided by OUC (2016)}				

Orange County Utilities Department (OCUD)

The Orange County Utilities Department (OCUD) provides water to approximately 3,000 City connections out of approximately 141,100 connections served. As of 2015, annual average demand was approximately 78 MGD. OCUD has one approved CUP in the SJRWMD and three approved Water Use Permits (WUPs) in the SFWMD. The total permit allocation is 102.4 MGD. In 2030, it is projected by OCUD that it will serve 20,034 City users for a total demand of 2.72 million gallons per day.

Several large, undeveloped areas inside City limits are found in the south-east, primarily along Narcoossee Road and along SR. 417, including Beltway Commerce Center DRI, Vista Commerce Park, Vista Park and other recent annexation areas, which were not all included in 2015 City area description. (See map on page 9). The City has provided land use and water demand information to OCUD. The Orange County Water Supply Facilities Work Plan will include additional detail about projected demand for OCUD in the south-east.

City of Winter Park Water and Wastewater Utilities Department

The Winter Park Utilities Department (WPUD) reports providing water to approximately 211 City residents out of approximately 67,256 residents served. WPUD has an approved CUP from the SJRWMD. The total permitted allocation is 12.7 MGD in 2025. The portion of WPUD service area that is within City limits is largely built out.

Total demand from properties within Orlando's City limits is expected to grow due to projected small-scale redevelopment projects. The City has provided its projected land uses and demand to the Winter Park Planning Department and believes development within City limits will have a de minimis impact on WPUD.

Taft Water Association

The Taft Water Association provides water to approximately 2,500 residents all outside City limits. SFWMD estimates that by 2025, the population will increase from 2,500 to 2,700 people, and water demand will increase from 0.27 MGD to 0.33 MGD. The Taft Water Association has an ap-

proved CUP within the SFWMD. The CUP allows a total allocation of 0.29 MGD.

Property located within the Taft Water Association service area and within City limits consists of one 12.88-acre parcel developed with a warehouse and one 10.4-acre undeveloped parcel. No City residential property is currently located within the Taft service area. There is no information on demand or supply for this area.

Development within City limits will have a de minimis impact on the Taft Water Association. Furthermore, the Growth Management Plan's Future Land Use Element includes Subarea Policy S.33.2 directs the City not to annex property in the Taft community. Therefore, additional annexations or other increases in demand, in this area, are not likely. It is anticipated that the Taft Water Association data, along with the City of Winter Park data, will be incorporated into the Orange County Water Supply Facilities Work Plan.

WATER SUPPLY STRATEGIES

The City of Orlando and the water supply utilities have identified three major strategies for meeting water demand with sufficient water supply. The first is to treat and reclaim wastewater for use as landscape irrigation. The second is to encourage conservation measures to decrease demand. The third is to explore water sources other than the Floridan aquifer. These alternative sources may include salt water, brackish groundwater, or surface water from reservoirs and rivers. All of the alternative supplies would require extensive treatment and are more costly than traditional groundwater supplies.

Reclaimed Water

In order to offset demand for potable water in the OUC service area, the City supplies reclaimed water for irrigation purposes. The City of Orlando currently operates three water reclamation facilities (Iron Bridge, Conserv I, and Conserv II) that treat wastewater to meet public access reclaimed water standards. The water from all three facilities is suitable for residential and commercial landscape irrigation and for other uses to offset groundwater withdrawals.

Figure 8, below, provides the current and projected supply (average daily flow) of reclaimed water from each City facility. Figure 9 on page 14 provides a map of the reclaimed water service area. Orange County also provides reclaimed water to OUC customers.

Project RENEW

As required by Condition #29 of the Consumptive Use Permit 3159 (CUP) issued by SJRWMD in 2014, OUC is required to implement a regional reuse program. (A full description is provided in CFWI documentation.) The original project planned to provide 9.2 mgd of reclaimed water from the City of Orlando’s Iron Bridge Water Reclamation Facility to Northwest Orange County to offset adverse impacts from OUC’s pumping at the full CUP allocation of 109.2 mgd. Phase I of Project RENEW must provide at least 3 MGD of reclaimed water and must be completed no later than October 8, 2020. Phase II of the project must provide the entire 9.2 MGD of reuse and must be completed no later than October 8, 2022. OUC has a 2006 agreement with the City of Orlando to provide reclaimed water for Project RENEW. OUC also has an agree-

ment with the City of Apopka for accepting reclaimed water from Project RENEW.

It is anticipated that the project will soon be re-evaluated in order to determine the best location (s) for reclaimed water in the region that is environmentally, technologically, and economically feasible. Project RENEW may also be used to meet an adopted MFL prevention and recovery strategy. Updated engineering studies, which identify the chosen alternative for Project RENEW, must be submitted within 2 years after adoption of the MFL Prevention/Recovery Strategy for South Lake, Orange and Seminole Counties by the SJRWMD Governing Board.

OUC has \$7.5 million budgeted in its 5 year capital plan to complete the design and start construction of Project RENEW.

Eastern Reclaimed Water System

The City of Orlando’s Eastern Regional Reclaimed Water Distribution System (ERRWDS) was designed and constructed to supply approximately 33 mgd from the City’s Iron Bridge Water Reclamation Facility to the OUC service area, Orange County, Seminole County, UCF, and Oviedo. The multi-phase project was constructed from 2006 through

Figure 8. Supply and Demand for Reclaimed Water (MGD)

	2015	2020	2025	2030	
Supply					
Iron Bridge and Conserv I	26.3	27.6	28.8	29.4	
Conserv II	14.2	14.9	15.2	15.3	
Demand (1)					
Public Access Reuse Demand	16.2	19.5	22.3	22.5	
Minimum Wetland and RIB target flow targets	16.0	16.0	16.0	16.0	
Excess supply available for other uses (2)					
	8.3	7.0	5.7	6.2	

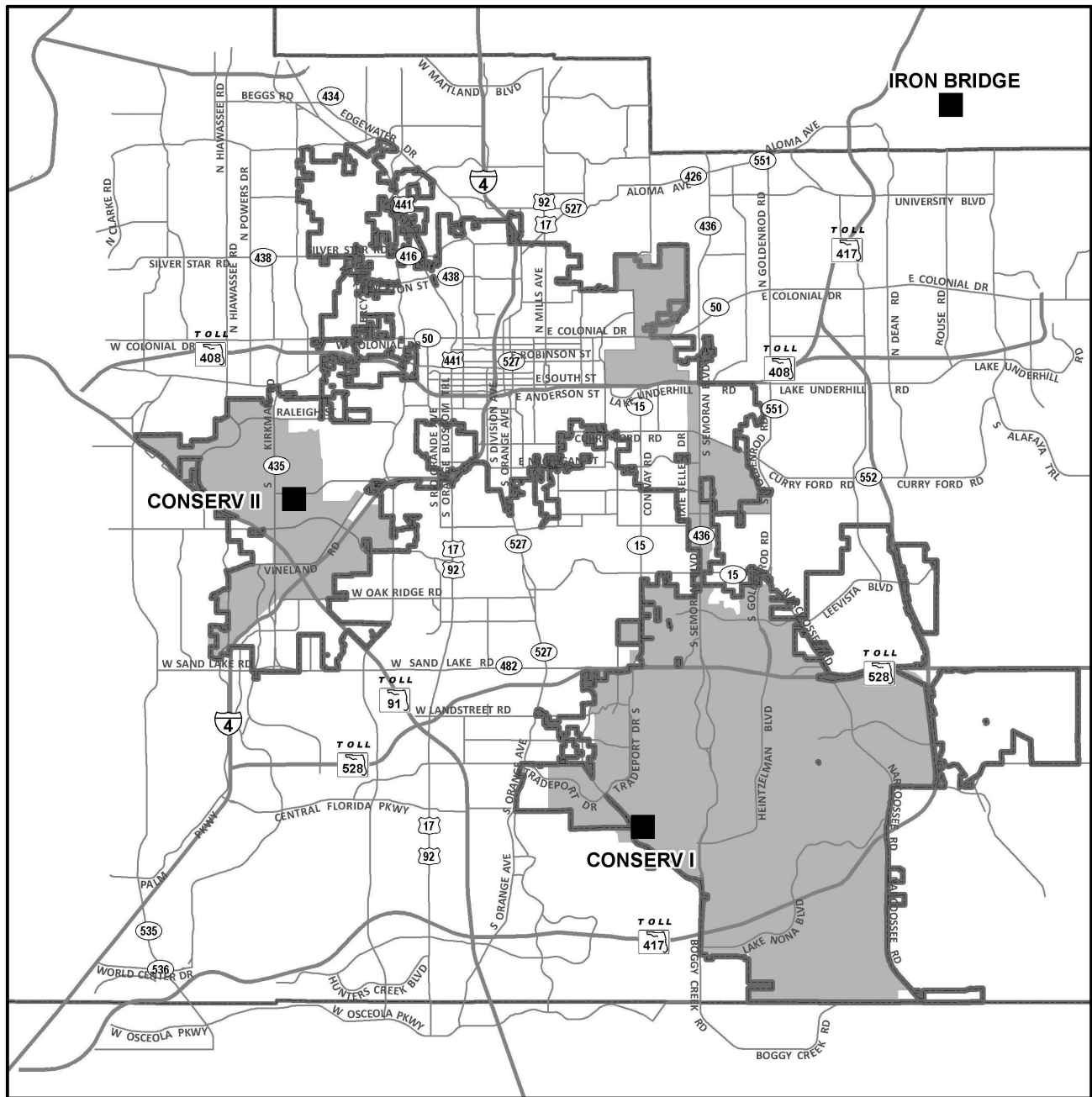
Notes: (1) Includes average annual demands in Seminole County, Orange County, and OUC service area per Carollo draft report plus minimum wetland and Rapid Infiltration Basin (RIB) flow targets.

(2) Using annual average demands to determine excess supply available is not recommended. A seasonal water balance using monthly demands is needed to determine the true excess supply available.

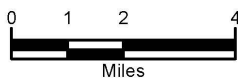
(Table provided by OUC 2016)

**Figure
WW-9**

Reclaimed Water Service Areas



LEGEND



- Water Reclamation Facility
- Reclaim Service Area
- Orlando City Limits



City of Orlando, Economic Development Department
City Planning Division, January 2016

Amended September 6, 2016, Effective January 18, 2011, Doc. Num. 1011011101

2011. OUC partnered with the City in constructing the ERRWDS and has paid the City over \$16.9 million dollars to complete plant improvements, construct reuse mains, booster pump stations, and a supplemental well. The remaining portion of the project, the Lake Nona storage and repump station, has been put on hold until it is needed when reuse demands increase. OUC has \$1.7 million budgeted in the 2017 5-year capital plan for its share of the costs to complete construction of the Lake Nona storage and repump station.

At present, ERRWDS transports reclaimed water from the Iron Bridge Regional Water Reclamation Facility to OUC's service area in Baldwin Park, the SR 436 Corridor, and the southeast service area which includes the Orlando International Airport (OIA) and Lake Nona. Completion of this system also allows Orange County to use the reclaimed water pipeline and supply more customers in the OUC service area with reclaimed water. The City will also provide the County with additional reclaimed water if they cannot meet all of their customer demands. Having more reclaimed water available to the OUC service area allows OUC to conserve potable groundwater, protect the environment and help meet future demands.

Orange County Utilities Reclaimed Water

OCUD has a number of reclaimed water supply projects planned for the next few years. All together, the projects will provide up to 12 MGD of reclaimed water by 2020. In addition, OCUD has several plant projects that will increase the wastewater treatment capacity by 29 MGD by 2027. While not all of these projects will serve properties inside City limits, they do allow OCUD to meet its CUP and WUP requirements, thus ensuring a continued supply of water for all property served within the permit areas. (These activities are detailed in the Orange County/City of Orlando Southwest Wastewater Facilities Interlocal Cooperative Agreement and the Eastern Regional Reclaimed Water Distribution System Agreement.)

Agreements

As stated in Intergovernmental Coordination Policy 1.3.4, the City of Orlando shall continue to

work with OUC, Orange County and Winter Park to maintain agreements describing the location of each utility's potable water service area and associated service provision commitments.

CONSERVATION

This section primarily addresses various OUC and City of Orlando both new and established conservation programs and projects.

Conservation Overview

The City promotes water conservation through its development regulations and other initiatives. The City also supports OUC in its efforts to educate the public about water conservation. Both entities have made great strides in increasing reclaimed water piping and use within OUC's service area, by completing the multi-phase ERRWDS project, as mentioned previously.

Since 2004, reclaimed water use in the OUC service area has increased approximately 7.7 mgd, or an estimated 121% increase. This includes reclaimed water from the City of Orlando and Orange County Utilities. The increase in reclaimed water use offsets irrigation demands that would otherwise be served using groundwater.

OUC has a comprehensive water conservation plan first approved by the SJRWMD in February 2003. OUC has also submitted a 10-yr conservation status report to the SJRWMD in December 2013, which provides updated information regarding OUC's conservation efforts.

OUC's comprehensive water conservation program includes water conservation education using a comprehensive media campaign featuring various communication channels, community outreach, special programs and campaigns; education and enforcement of landscape irrigation guidelines; water distribution system improvements and leak detection including renewal and replacement of piping and meters; conservation promoting rate structures and rate increases; customer audits (both indoor and outside irrigation); conservation rebate programs for various conservation measures; combined electric and water conservation programs and campaigns, as well as reclaimed water use.

OUC is committed to water conservation and has achieved significant savings since the 20-year consumptive use permit (CUP) was issued in 2004. OUC's demands have decreased over 14 percent since 2004, far exceeding the City of Orlando's objective of reducing total per capita potable water demand by 7 percent between 2004 to 2015. At the same time, connections increased by nearly 10,500.

OUC reports that gross per capita demand was reduced from 225 gallons per person per day in 2004 to 193 gallons per person per day in 2015. Since nearly half of OUC's demand is from commercial services, gross per capita, rather than residential per capita, is the best metric to use in determining conservation savings.

City Initiatives

The City of Orlando has implemented a number of water conservation elements including Greenworks plan initiatives, use of Florida-friendly planting principles and the requirement of ultra-low volume plumbing in new construction.

Greenworks Community Action Plan

Through the guidance of the Greenworks Community Action Plan, approved in 2013, the City of Or-

lando is transitioning into one of the most environmentally-friendly, economically and socially vibrant communities in the nation. As a leader in reclaimed water use, the City views water and water conservation as key area of the overall plan.

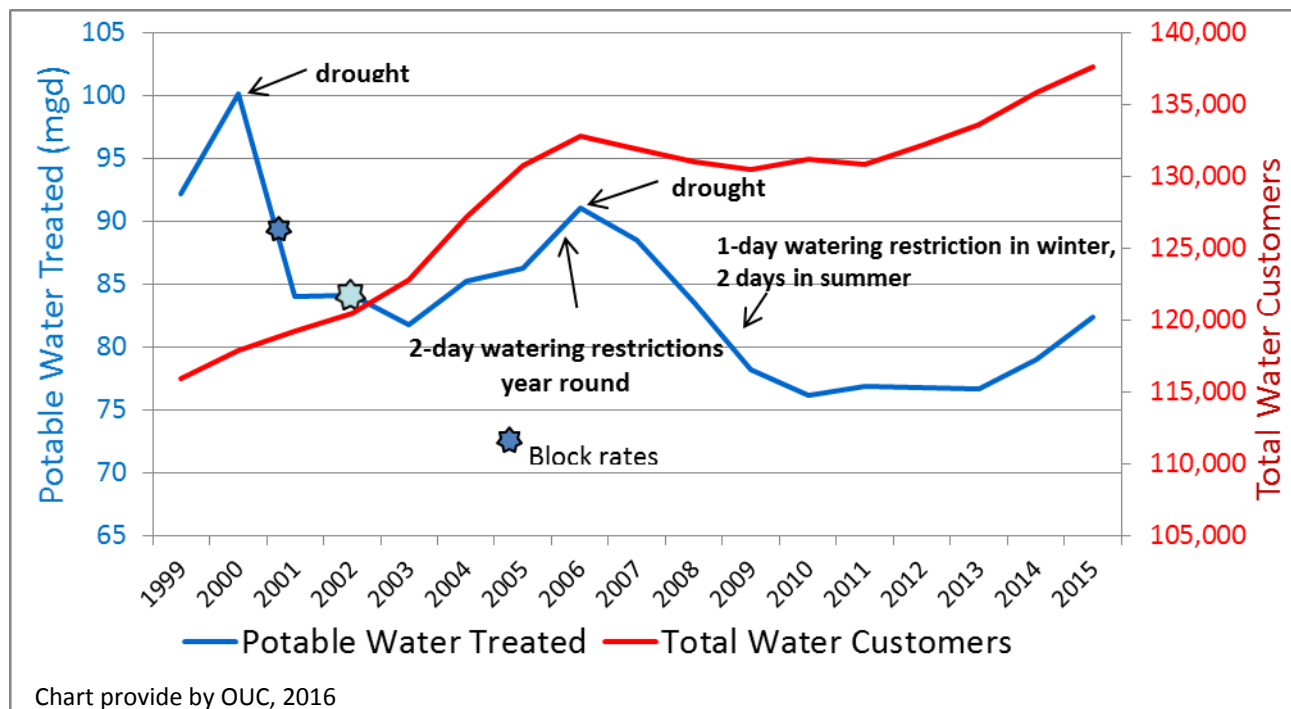
Important findings that emerged from the Greenworks Community Action Plan was the need for an updated landscaping code. (Please see next section).

Yet another area is the City of Orlando's Building Energy and Water Efficiency Strategy (BEWES). It is a policy that will focus on tracking the energy and water efficiency of the City's largest buildings. It is anticipated that by equipping the community's commercial property owners with this information, efficiency will improve and there will be far reaching conservation and economic benefits.

BEWES calls on existing commercial, institutional, and multi-family buildings larger than 50,000 square feet to track whole-building energy use, report to the City annually, and make their information transparent to the real estate marketplace.

The policy covers less than five percent of Orlando's buildings, but accounts for more than 50

Figure 10. OUC Conservation Results



percent of total energy and water used by all buildings citywide. Electric power generation is the largest user of water, so reducing energy demand has a strong effect on preserving limited water supply.

Landscaping Code (LDC Sec.60-200-60.234)

On April 1 2014, the City of Orlando adopted a new landscaping code. Through the Greenworks planning process and input from stakeholder meetings, the code was developed over a multi-year period and includes best practices from North America and Europe and addresses new State of Florida regulatory standards. Consistent with the Florida-Friendly Landscape Principles and South Florida Water Management District Xeriscape Plant Guide II, the City's landscaping ordinance specifically addresses the recommended use of Florida-friendly landscaping materials and the minimum percent of required pervious areas.

As part of the updated code, water conservation is addressed through encouraging native/drought tolerant landscaping and plants that are adapted to Central Florida rainfall, supporting the use of plants suited to the growing conditions of a particular location, and establishing standards for the efficient installation and maintenance of plants and micro-irrigation systems. Water uses are addressed in several code sections, including Section 60.223. All irrigation systems must comply with City Code Chapter 60, Part 2I, which requires efficient controls, pressure-compensating nozzles, and leak detection equipment.

While an irrigation system is not required, if selected, it must meet certain standards that may include soil-moisture sensors and weather-based controllers and be consistent with Florida Water Star standards. As it concerns Non-Residential and Multifamily Landscaping Requirements (Part 2G.), plants, preferably low water need native plants, are to be grouped by water need and should be watered according to need. Turf is limited to 60% of the landscaped area. New development landscaping must also meet a minimum point threshold for approval. Points are awarded according to broad-based criteria including evapotranspiration,

soil moisture sensors, rainwater harvesting, tree conservation, and in ground system. Drought-resistant plants are also awarded higher points.

While not addressed in the landscaping code, the City of Orlando complies with mandatory year-round irrigation conservation measures, as detailed in 40E-24 Florida Administrative Code. Moreover, the City has adopted the Florida Building Code, which requires the installation of rain sensors in new irrigation systems.

If irrigation is to be installed, City Code requires the use of reclaimed water as the irrigation source, where available. Where unavailable, the new code rewards the use of other non-potable sources, such as storm-water ponds, canals, and rainwater harvesting systems.

In 2014, the City adopted a fertilizer ordinance (Section 31.26 of City Code), based upon and consistent with the State of Florida model ordinance. This ordinance is crafted to lessen reliance on fertilization, and by extension, lessen demand for irrigation. Strict guidelines were included to protect natural water bodies from fertilizer nutrients.

Emergency Situations

The City of Orlando does not have separate water use code requirements during an "emergency situation", as declared by the pertinent Water Management Districts to reduce water consumption, thereby alleviating a local water shortage within the City of Orlando's water system. Instead, the City follows the District's direction, as to the minimum amount of water necessary to conduct operations.

Ultra-Low Volume Plumbing in Construction

As noted earlier, the City of Orlando has adopted the Florida Building Code (FBC) which contains plumbing flow restriction requirements. The City's Permitting Services Division also includes in their new construction requirements, water conservation control devices installed per the Florida Plumbing Code.

Concurrency Management

The City requires sufficient capacity in its concur-

rency management system before an applicant may receive a building permit. This ensures that the City's level of service standards are met. If a deficiency is identified, the City has the authority to deny permits. Although historically the City has not had to use this authority to address water shortages, it is an available solution of last resort. This strategy may also be useful if temporary shortages are expected while waiting for additional capacity to be built.

Reclaimed Water Rates

The City of Orlando charges a reclaimed rate of \$0.81 per thousand gallons, significantly lower than potable water rates. Further, the City's reclaimed water ordinance (City Code, Chapter 32) requires property owners to connect to the reclaimed water system, if facilities are available (defined as being within 100 feet of a residential property or 1,000 feet of a non-residential property). Additional information is provided through the City's new Water Reclamation News posted at <http://www.cityoforlando.net/wastewater/water-reclamation-newsletter/>.

Key OUC Initiatives

The following are some general and demonstration programs and projects related conservation initiatives, including tiered water rates, voucher programs and annual water audits, administered by OUC, and which support water conservation efforts within the City of Orlando, and other service areas.

Education Programs

OUC delivers year-round public information media

campaigns to better educate customers and the community about the importance of water conservation. OUC implements comprehensive media campaigns that utilize print, online, television, radio and outdoor media as well as other specialized outlets such as direct mail and community partnerships. OUC uses social media including Facebook and Twitter. OUC distributes conservation videos to local schools, customers, and community organizations.

OUC's conservation specialists and Marketing and Community Relations staff routinely work trade shows and civic events throughout the year to promote conservation. OUC's school programs, the Water Color Project and Project AWESOME, (see <http://www.ouc.com/>) help teach young people to respect the value of water and help them grow into environmentally conscious adults.

3.5.2 Landscape Irrigation Audits

OUC conducts irrigation audits for customers who use large quantities of irrigation water. OUC utilized East Central Florida RC&D Council, Inc. to conduct these services from 2003 through 2011. During this time, the Mobile Irrigation Labs (MIL) performed 361 irrigation audits. In late 2012, OUC contracted with Clear Water Products & Services Inc. to provide both Mobile Irrigation Services and Florida Friendly Landscaping Verification Services for OUC's new rebate program. The contractor completed 89 landscape irrigation audits through December 2015.

Figure 11. Lexington Court is certified as a Florida Water StarSM Community

The St. Johns River Water Management District certified Lexington Court as a Florida Water StarSM Community. The 108-unit apartment complex was constructed by Atlantic Housing Partners, LLC, and is located on West Concord in downtown Orlando. The affordable housing community features water-efficient faucets, showers, dishwashers and clothes washers. The landscaping is drought-tolerant and suited to the area. The landscape uses micro-irrigation to minimize water use outdoors. The certifier, Lisa Percy, from All Elements Mechanical, worked closely with Atlantic Housing Partners to maximize opportunities for water efficiency.



OUC's conservation specialists personally visit customers to perform water audits and energy surveys, 20% of which included water audits. These audits are typically requested by the customer, or can be initiated by OUC, as a result of high water use on a customer's bill. Toilets, faucets, and more recently, lawn irrigation systems, are typically checked during these audits. The Conservation Specialists perform lawn irrigation system checks (zone checks and timer checks) on all water audits and on energy audits, where there appears to be high water usage, or the customer requests that OUC look at the irrigation system. They reset irrigation timers approximately 10 percent of the time at the request of the customer and only with their permission.

Beginning in 2007, OUC started distributing water conservation kits to customers requesting water audits. OUC offers a combined energy and water conservation kit to residential customers receiving an in-home energy audit. OUC also offers a separate water conservation kit to customers only receiving a water audit.

Water Efficient Demonstration Projects

In 2009, OUC's Reliable Plaza earned Gold Leadership in Energy and Environmental Design (LEED) certification, officially cementing the 10-story administration and customer service center as the "Greenest Building in Downtown Orlando." The non-profit U.S. Green Building Council awarded the Gold level certification after completing a review of the building's design and construction. Reliable Plaza was also one of the first commercial buildings to hold a Florida Water Star certification, a voluntary program for new and existing construction that encourages water efficiency in appliances, plumbing fixtures, irrigation systems and landscapes. The building was designed to use about 28 percent less energy and 40 percent less water than similar buildings built to code.

In 2012, water efficient landscaping signage was updated around the building to identify drought tolerant species, water cistern, irrigation practices and low-flow toilets. The revitalized signage allows tour participants to identify the green and sustaina-

ble practices. Tours are provided to local civic groups and community organizations on request.

Annual Water Audits

Since issuance of OUC's CUP in 2004, OUC has been submitting annual water audits to the St Johns River Water Management District. Unaccounted-for-water for calendar years 2004 through 2015 have varied from year-to-year with no apparent trend, but have ranged from a high of 8.39% in 2008 to a low of 4.97% in 2012. Since these levels are well below 10%, the water distribution and metering systems are considered to be efficient by the SJRWMD.

Conservation Promoting Water Rates

OUC continues to be a leader in being an early adopter of rate structures that encourage water conservation, while at the same time keeping the price of water affordable for basic needs. Dating back to March 2001, OUC adopted an inverted block rate structure with 4 tiers for all residential and commercial 5/8" meter water users. This rate structure provides the customer significant financial incentives to manage their water use by charging a lower rate per 1,000 gallons, for lower usage and a higher rate for higher usage. Multiple studies, including Dr. Whitcomb's 2005 research study firmly supports the conclusion that water use decreases as price increases (Whitcomb J.B. 2005a. *Florida Water Rates Evaluation of Single-Family Homes* Northwest Florida Water Management District, Havana, FL. <http://www.nwfwmd.state.fl.us/permits/waterratesreport.pdf>.)

One of OUC's greatest innovations was to develop and more importantly, successfully implement, a commercial irrigation inclining tiered rate structure that was based on customers' irrigated acreage. Again, OUC was an early adopter of this innovative concept and inverted this rate to all of OUC's commercial irrigation customers with meters 1" and larger as of Oct. 1, 2002. The design of this rate structure provides stronger incentives to commercial customers to use less than half of the theoretical permissible irrigation water use that could occur if they simply set their irrigation timers to water twice a week. This strategy encourages customers to water less than two times per week,

install, maintain and use a rain or soil sensor, use efficient landscape design and make good choices in plant material.

Since then, OUC has instituted several rate changes and made rate structure changes to further increase the pricing signals that promote the conservation ethic. The rate increases have been more heavily weighted on the higher consumption tiers. In 2004, only the highest tiered rate was significantly increased to meet OUC's water revenue requirements. In 2007, OUC changed its tiered rate structure by adding a fifth tier which allowed a slight decrease in the "lifeline" rate for the initial 3 Kgals and significantly increased the pricing penalty of using more than 30 Kgals. In 2008, OUC only increased the upper two tiers. In 2009, OUC did not affect the tiered rates, but did increase its customer charges and raised its commercial water rate by approximately 15%.

Rebate/Voucher Programs

In 2009, OUC contracted with Niagara Conservation Corporation to administer a pilot residential toilet voucher incentive program. The program targeted specific neighborhoods based on the age of home. Between 2009-2011, 845 toilets were replaced with low flow or high efficiency models.

OUC also began offering rebates to residential and commercial customers for water saving practices beginning in 2009. This included rebates for water cisterns/rain barrels and rebates to builders for homes built to Florida Water Star standards. In 2012, OUC added the Energy Star Clothes washing machine rebate, toilet and urinal rebates, air-cooled ice machines, and Florida Friendly Landscaping and Irrigation Repair rebates. Through 2015, OUC has issued nearly 3,800 rebates. The majority of the rebates to date have been for Energy Star clothes washing machines (54%) and low flow toilets (40%).

Special Programs

Green Neighborhoods

Created through a partnership between OUC– The *Reliable One* and the City of Orlando. The Green Neighborhood Program was developed to in-

crease the energy and water efficiency of approximately 1,000 homes in six neighborhoods throughout the City. By installing a comprehensive suite of energy and water conservation measures, customers would reduce both their kilowatt hours and gallons of water consumed. In turn, this would lower their overall utility bills.

The neighborhoods chosen for participation in the Green Neighborhood Program were carefully selected utilizing an energy intensity map. These neighborhoods are some of the most energy inefficient neighborhoods in the City and would benefit the most from the weatherization measures installed as part of this program.

The Green Neighborhood Program was funded with \$500,000 from the City and \$275,000 from OUC. The City's financial contribution came from a grant received through the Department of Energy (DOE) as part of the American Reinvestment and Recovery Act (ARRA). OUC's contribution came from existing conservation funds. The program was started in 2010 and concluded in 2011.

The energy (weatherization) and water saving measures installed as part of this program were done at no cost to the customer and included: bath and kitchen faucet aerators, six compact fluorescent light bulbs, air conditioning unit air filters, a refrigerator thermometer, caulking and weatherstripping, refrigerator coil cleaning, door sweeps and door weatherization, low flow showerheads, pipe insulation for water heaters, foam sealant for structural gaps, toilet flapper valves, water heater temperature reduction, duct repair and sealing, and attic insulation.

Efficiency Delivered

The Efficiency Delivered program went "live" to OUC customers in May 2012. The goal of the new program is to provide water and energy efficiency to all of OUC's customers regardless of income level. This energy and water conservation program is an adaptation of the Home Fix-Up Program, which provided weatherization assistance to low-income home owners and the Financed Insulation Program.

There are four levels of customer income and each receives a different percent contribution from OUC. For example, Level 1 customers, with a household income of \$40,000 or less, receive an 85% contribution from OUC, while the other 15% is the customer's responsibility. Level 4 customers, with a household income of \$75,000 or more, have 100% customer responsibility, but all applicable rebates apply. The water conservation components are being tracked and include minor plumbing leaks, faucet aerators, low flow showerheads, toilet tank flappers, irrigation repair, irrigation control box replacements, and toilet replacements.

Advanced Meter Infrastructure Water Meters

Between 2013 and 2016, OUC changed out all of its 147,000 standard water meters with digital advanced metering infrastructure (AMI). OUC's Meter Data Management (MDM) system went live in 2013 to support the conversion to AMI meters. The benefits for OUC and its customers include access to daily usage information; support for high bill complaints; access to daily reads and interval data; enhanced leak detection capabilities; foundation groundwork for the automation of remote connects and disconnects to support pre-paid metering; and the ability to streamline other business processes.

SJRWMD-OUC High Water Use Customer Pilot Program

In 2015, the St. Johns River Water Management District approved funding for OUC's Conservation Project Targeting Irrigation Customers with High Potential for Water Conservation Savings, "a-not-to-exceed" amount of \$369,397 over a two year period (FY 2016 and 2017). Queries were developed to identify customers who are not in compliance with SJRWMD irrigation guidelines, customers with recent unusual increase in water use based on historical usage pattern, and customers using more water than normal for their home.

Once information has been gathered, OUC will periodically send out marketing material with tailored messaging informing and educating customers on opportunities to reduce their portal water use. Customers will either address the issue themselves or take advantage of contacting one of 3 qualified con-

tractors, OUC has partnered with to help. The contractors will educate and perform one or more of the following services upon request at reduced prices:

- Perform an operation based irrigation audit and reset irrigation timer;
- Repair/Replace broken irrigation piping and/or heads;
- Install soil moisture sensors/controller;
- Install Evapotranspiration (ET) controller; and
- Design and Install Florida Friendly Landscaping.

Alternative Water Supplies

Potable water may be available from sources other than the Floridan aquifer. This section addresses surface water such as rivers and streams, brackish groundwater, or seawater. Each of these sources requires more treatment than fresh groundwater. The water management districts are working with local utilities to assess the technical and financial feasibility of these alternatives.

St. Johns River/Taylor Creek Reservoir Project

Currently, OCU and OUC are formally mediating with the City of Cocoa, Tohopekaliga Water Authority (TWA), East Central Florida Services, Inc., and SJRWMD to resolve competing CUP applications for withdrawals from the new St. Johns River/Taylor Creek Reservoir Water Supply Project. This source will provide up to an estimated 50 mgd of surface water for the populations served by the project partners, a majority of which will reside within Orange County.

Funding for development of this surface water supply will be split among the project partners, with the potential for co-funding from the water management districts, state or federal government. OCU has committed to receive at least 10 mgd, and OUC has committed to receive at least 5 mgd, of new alternative water supply from this project. OUC has \$2 million budgeted in its 2017 5-year capital plan to pay for OUC's portion of permitting and initial design costs for the SJR/TCR Project.

Aquifer Recharge

Aquifer recharge with reclaimed water is a water

resource management strategy to avoid potentially negative impacts resulting from increased groundwater withdrawals. It is considered to be an effective way to increase the amount of available water and to potentially mitigate potential impacts of drawdowns on the surficial aquifer. OUC has examined three methods of recharge: Rapid Infiltration Basins (RIBs), direct recharge, and using stormwater for recharge.

Of the three methods, RIBs are relatively inexpensive and already in use in the City. The drawback is the large amount of land required for their use. Given the land requirement, OUC would likely need to partner with Orange County for any future RIB projects. Direct recharge, on the other hand, requires very little land. However, discharged water would likely require additional treatment before entering the aquifer. Further studies of this method will be required before it is widely accepted. While the City's stormwater system designs have the potential to maximize removal of pollutants prior to discharge into the drainage well system, it is not currently considered a feasible alternative.

Potential pollution of aquifer recharge water presents an additional threat to continued use of groundwater for domestic consumption where drainage well water is contaminated from polluted urban runoff.

4.0 Projected Water Needs and Sources

As noted earlier, population and water demand projections for OUC were developed during the CFWI planning process and completed in 2015. The projections are included in Table A-1 of the 2015 final CFWI RWSP, Volume A. The projections are based on a 1-in-10 year rainfall, which increase demands by 6%, are also provided in the RWSP (See <http://cfwiwater.com/>)

Reclaimed water supply and demand estimates were developed by Carollo in 2016 for the City. In order to calculate reclaimed water supply available to OUC from the Carollo report, OUC extracted the supply and demands specific to the OUC service area by subtracting non-OUC demands, golf courses,

and minimum wetlands and from the City's RIB target flows. OUC also added 3 mgd to the supply and demand estimates from the Carollo report to account for reclaimed water being served to the OUC service area from the County.

OUC's groundwater supply is limited by OUC's CUP rather than OUC's well and treatment plant capacity, as shown in Appendix B Table A.1. OUC assumes that the SJR/TCR alternative water supply project will be constructed and operational by 2030 and that OUC will receive 5 mgd from this project.

Estimates of additional conservation savings for OUC's rebate programs, above and beyond the savings that have already been achieved, were developed for OUC by CH2MHILL in a study completed in 2013. This study estimates that approximately 0.5 mgd can be saved every 5 years with ongoing rebate programs.

The forecasted total water supply needs and sources for OUC are provided in OUC Figure 7. This figure indicates that OUC has sufficient supply capacity through the year 2030.

5.0 Proposed Work Plan

This Work Plan is based on information provided in previous sections of this document, as well as the data provided in the appendices. This Work Plan is also intended to meet the requirements of the Wekiva Parkway and Protection Act. This plan is being amended to meet the requirements of Section 163.3177(6)(C)3. An update to the City's Growth Management Plan and this Work Plan will be completed to address the entire Work Plan components of Chapter 163, F.S., within 18 months of CFWI RWSP approval or by May 17, 2017.

Water Conservation Practices

The following are key conservation measures and related activities.

City Practices and Related Policies

As described in the earlier Section 3, the City has implemented a number of conservation practices. The City plans to maintain, and where possible, improve upon these efforts.

For the 10-year period of this Work Plan the City will continue to focus on the following conservation strategies:

- Require water reduction devices in new construction (Conservation Policy 1.8.1, Potable Water Policy 1.2.1);
- Support landscape related water conservation requirements for most types of development (Conservation Policy 1.8.1, Potable Water Policy 1.2.1);
- Require native vegetation to reduce potable water use (Conservation Policy 1.8.3, Potable Water Element Policy 1.2.4);
- Incorporate advances in water conservation practices in building and land development codes (Conservation Policy 1.8.1, Potable Water Policy 1.8.1);
- Continue use of a concurrency management system to ensure adequate water supply is in place prior to issuing a building permit (Capital Improvements Element Policy 2.1.3); and
- Require use of reclaimed water where available (Conservation Policy 1.8.2, Potable Water 1.2.3).

OUC Practices and Related Policies

For the 10-year period of this Work Plan OUC will continue to focus on the following conservation strategies:

- Promote water conservation through website information and other outreach efforts (Potable Water Policy 1.2.9);
- Conduct landscape irrigation audits for high-volume users (Potable Water Policy 1.2.10);
- Conduct water audits to help customers increase efficiency. (Potable Water Policy 1.2.2)
- Ensure accurate metering to ensure accountability of water use (Potable Water Policy 1.2.5); and
- Maintain inverted block water rates and increase over time if necessary (Potable Water Element 1.2.11).

Private Practices and Policies

In addition, as green building standards have be-

come more popular, the private sector is voluntarily implementing water savings programs as part of an overall effort to improve environmental building practices. These programs include:

- LEED (Leader in Energy and Environmental Design). This nationally recognized program certifies buildings that meet criteria for energy efficiency, use of sustainable materials, water efficiency and waste reduction.
- Florida Green Building Coalition: This program has criteria designed specifically for Florida's climate, and includes neighborhood-level standards to allow for certification of projects that provide innovative stormwater management systems, water efficient landscaping irrigation systems, and other water reduction strategies (<http://floridagreenbuilding.org/>).
- Florida Green Lodging Program: The Florida Department of Environmental Protection certifies hotels that have met environmental standards for energy use, waste reduction, air quality and water use. Hotels must choose at least three water saving options the FDEP list. So far, three hotels within City limits have obtained the Green Lodging designation (<http://dep.state.fl.us/greenlodging/default.htm>)
- Florida Water StarSM : A state-wide program since 2012, SJRWMD launched this effort to certify home builders that meet the Water Star criteria by providing efficient appliances, plumbing, and irrigation. There is also a voluntary program for new and existing construction that encourages water efficiency in appliances, plumbing fixtures, irrigation systems and landscapes (<http://floridawaterstar.com/>).

Florida Water StarSM can also be effectively integrated into projects along with other programs such as ENERGY STAR®, the Florida Green Building Coalition's (FGBC) green standards, and the U.S. Green Building Council's (USGBC) LEED program. Florida Water Star, since the performance-based approach can enhance projects by providing a suite of efficiency practices that focus on water use areas specific to Florida.

- Greenworks Orlando: As discussed earlier, the City, with support of Greenworks, is striving to improve its water efficiency through strategically expanded reclaimed water opportunities, using pricing strategies such as price strategies such as inclining block rates, integrated water resource management and low impact design. The Greenwork's 2040 Goal is to reduce potable water consumption per capita by 20% from the 2013 baseline.

Reuse Practices

As described in Section 3, the City has implemented a number of reclaimed water projects. For the 10-year period of this Work Plan, the City will continue to focus on the following water reuse strategies:

- Maintain reclaimed water rates below potable water rates to encourage use of reclaimed water. Rates are adopted in City Code, Section 32.13;
- Maintain requirements for mandatory connection to reclaimed system where the system is available (Potable Water Element Policy 1.2.3, Conservation Element Policy 1.8.2);
- Meet the requirements of the July 24, 2006 agreement with OUC to implement Project Renew and the Eastern Regional Reclaimed Water Distribution System Project (City Council Document # 060724J02);
- Implement the capital projects as listed in Figure 12 and that are shown in the proposed GMP Figure PW-3, and similar to the potable water component in the Capital Improvements Element (CIE), as updated that apply to reuse and other activities (see next section).

Water Supply Projects and Financial Feasibility

The Potable Water GOPS Figure PW-3 provides a description of the proposed water supply projects that the City and OUC are proposing over the next 10 years. New projects may be added as necessary to maintain and improve the water supply system. It should be noted that the Capital Improvements

Fund Schedule (CIE Figure CI-14) is updated annually and commits the City and OUC to funding projects, as proposed.

As detailed on Figure 12, there are number of key projects, from 2017-2027, which will ensure that the adequate supply of water. Some of these projects are the St. Johns River/Taylor Creek Reservoir Project, Project RENEW and Eastern Reclaimed Water System, were described in the earlier sections. Other significant system related projects and programs with dedicated funding over the next five years include the Ozone Generator Program (\$37,408,000), Skylake WTP 7.5 MGD Well (\$1,530,000) and other Transmission and Distribution Projects (\$15,480,000). Most sources of funding will come from OUC.

GMP Policy Amendments

Given the plan's findings and the focus on regional cooperation and conservation, certain GMP policies and figures are proposed to be amended to address CFWI coordination, and up-date conservation and reuse efforts. The proposed amendments address the Potable Water, Wastewater, Conservation, Intergovernmental Coordination and the Stormwater and Acquirer Elements. Also included are updated maps showing potable water service area and potable water facilities (PW-1 and PW-2). (See Appendix A).

Conclusion

OUC, the City's main service provider, in partnership with the City and its departments, will continue to expand the availability of reclaimed water; maintain a robust conservation program to reduce potable water demand; and partner with the water management districts and local utilities to implement the St. Johns River/Taylor Creek Reservoir Project.

Based on information furnished by each water service provider and CFWI, the projected water demands can be met, subject to continued commitment to the water supply projects as well as conservation and reuse activities outlined in this document.

Figure 12. Ten-Year Schedule of Water Supply Projects (2017-2027)

Utility Serving Entity's Jurisdic- tion	Future Program or Program Providing Water to Jurisdiction	Purpose of Project	Funding Sources	OUC Year Total 2017-2027 (millions)
Orlando Utilities Commission (OUC)	St Johns River/Taylor Creek Reservoir Water Supply Project	OUC's portion of a regional al- ternative water supply project withdrawing water from the St. Johns River and Taylor Creek Reservoir. The project will pro- vide up to 50 mgd to multiple project partners.	OUC	38,931
OUC	Eastern Regional Re- claimed Water Distribu- tion System*	The City's ERRWDS project pro- vides reclaimed water to OUC's service area. OUC partnered with the City to pay for a signifi- cant portion of this system. The project is nearly complete with the exception of the Lake Nona storage and repump station.	OUC	1,718
OUC	Orlando Utilities Com- mission Project Renew*	OUC's portion of a regional re- use project to provide reclaimed water from the City's Iron Bridge facility to areas west of OUC's service area to offset ad- verse impacts from OUC's pumping.	OUC	27,525
OUC	Water Plant Modifica- tion and Equipment	Replace obsolete equipment and modify plants.	OUC	2,813
OUC	Plant Network Hard- ware/Software/Security	Plant hardware/software/ security upgrades.	OUC	3,050
OUC	Well & High Service Pump & VFD Upgrades	Replace, refurbish, improve well and high service pumps due to age and condition.	OUC	3,001
OUC	Southeast Plant Expans- ion Ground Storage	Increase onsite water storage to allow for increased fire de- mands.	OUC	2,647

Figure 12. Ten Year Schedule of Water Supply Projects Continued...

Utility Serving Entity's Jurisdic- tion	Future Program or Program Providing Wa- ter to Jurisdic- tion	Purpose of Project	Funding Sources	OUC 10 Year Total 2017-2027 (millions) Costs (\$)
OUC	Southeast Water Treatment Plant HSP	Increase pumping capacity and redundancy.	OUC	175
OUC	Skylake WTP 7.5 MGD Well	Improve well redundancy.	OUC	1,530
OUC	System Reliability Emergency Generator	Increase emergency power capabilities at water plants without emergency generators.	OUC	5,234
OUC	Granular Activated Carbon Treatment	Improve water quality to reduce the need for flushing.	OUC	3,200
OUC	Chlorine Conversion	Eliminate the risks associated with gas chlorine.	OUC	5,936
OUC	Ozone Generator Program	Replacement of the ozone generators nearing life expectancy and/or having serviceability issues.	OUC	37,408
OUC	Inter-Agency Projects	Required projects that are scheduled to coincide with FDOT, Orange County, or the City of Orlando's infrastructure improvements.	OUC	27,487
OUC	Other Transmission and Distribution Projects	Other pipelines and extensions, main installations to close loops to improve water quality or pressure, OUC up-sizing of developer pipes, etc.	OUC	15,480
OUC	Donated Water Transmission & Distribution	Water transmission and distribution facilities for new customers constructed and donated to OUC.	OUC	16,500
OUC	Constructed Water Transmission & Distribution	OUC provided water mains, hydrants, services, and meters for new development.	OUC	4,403

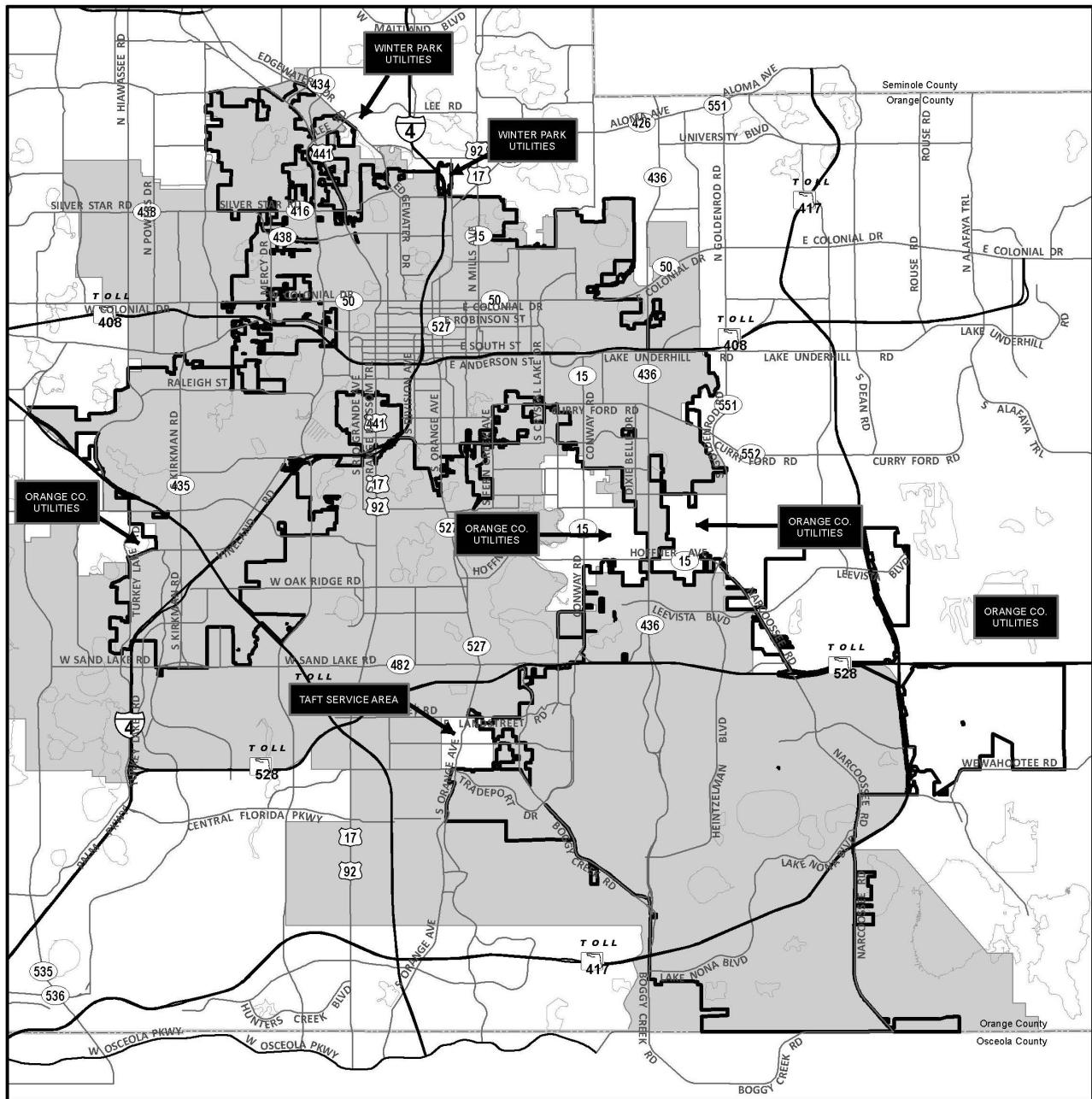
Note: Chart Information Provided by OUC (2016).

6.0 APPENDICES

APPENDIX A

Proposed GMP Amendments

Potable Water Service Area



LEGEND



- Orlando City Limits
 Orlando Utilities Service Area
 Orange County / Other Service Areas

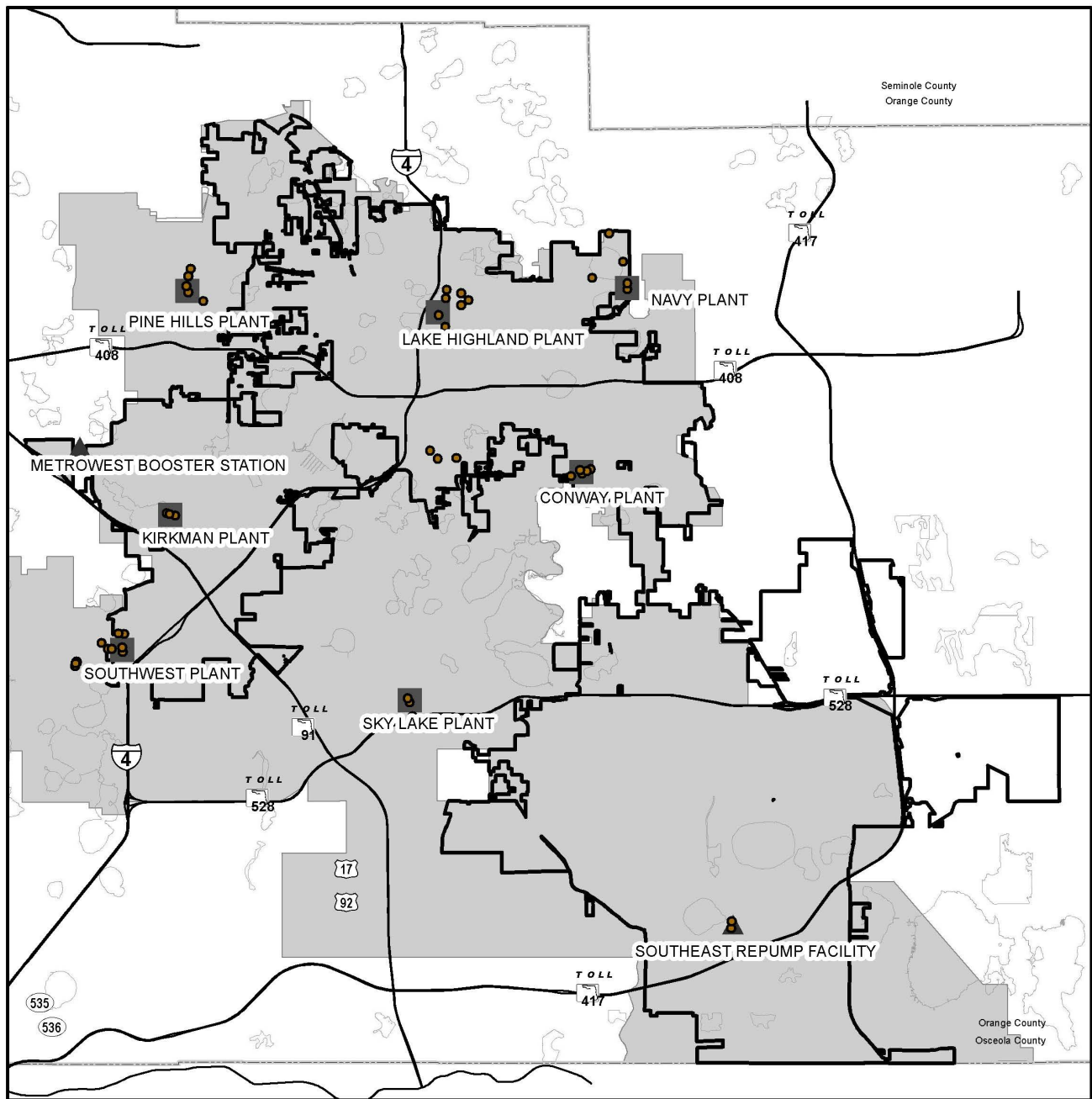


City of Orlando, Economic Development Department
City Planning Division, Dec 2016

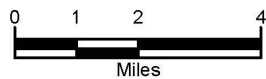
Amended January 22, 2007 ; Effective Date April 9, 2007;
Doc. Num. 0701221004, Supp. 06-RWSP1

PW-2

Potable Water Facilities



LEGEND



OUC Water Structures

- Well Sites
- PUMP STATION
- TREATMENT PLANT
- OUC Service Area
- Outside OUC Service Area
- Orlando City Limits



City of Orlando, Economic Development Department
City Planning Division, Dec 2016

Amended January 22, 2007 ; Effective Date April 9, 2007;
Doc. Num. 0701221004, Supp. 06-RWSP1

Figure PW-3
Ten-Year Schedule of Water Supply Projects 2017-2027

Utility Serving Entity's Jurisdiction	Future Program or Program Providing Water to Jurisdiction	Purpose of Project	Funding Sources	OUC Year Total 2017-2027 (millions)
Orlando Utilities Commission (OUC)	St Johns River/Taylor Creek Reservoir Water Supply Project	OUC's portion of a regional alternative water supply project withdrawing water from the St. Johns River and Taylor Creek Reservoir. The project will provide up to 50 mgd to multiple project partners.	OUC	38,931
OUC	Eastern Regional Re- claimed Water Distribu- tion System	The City's ERRWDS project provides reclaimed water to OUC's service area. OUC partnered with the City to pay for a significant portion of this system. The project is nearly complete with the exception of the Lake Nona storage and repump station.	OUC	1,718
OUC	Orlando Utilities Com- mission Project Renew	OUC's portion of a regional re-use project to provide reclaimed water from the City's Iron Bridge facility to areas west of OUC's service area to offset adverse impacts from OUC's pumping.	OUC	27,525
OUC	Water Plant Modifica- tion and Equipment	Replace obsolete equipment and modify plants.	OUC	2,813
OUC	Plant Network Hard- ware/Software/Security	Plant hardware/software/ security upgrades.	OUC	3,050
OUC	Well & High Service Pump & VFD Upgrades	Replace, refurbish, improve well and high service pumps due to age and condition.	OUC	3,001
OUC	Southeast Plant Expan- sion Ground Storage	Increase onsite water storage to allow for increased fire demands.	OUC	2,647

**Figure PW-3:
Ten Year Schedule of Water Supply Projects Continued...**

Utility Serving Entity's Jurisdic- tion	Future Program or Program Providing Wa- ter to Jurisdic- tion	Purpose of Project	Funding Sources	OUC 10 Year Total 2017-2027 (millions) Costs (\$)
OUC	Southeast Water Treatment Plant HSP	Increase pumping capacity and redundancy.	OUC	175
OUC	Skylake WTP 7.5 MGD Well	Improve well redundancy.	OUC	1,530
OUC	System Reliability Emergency Generator	Increase emergency power capabilities at water plants without emergency generators.	OUC	5,234
OUC	Granular Activated Carbon Treatment	Improve water quality to reduce the need for flushing.	OUC	3,200
OUC	Chlorine Conversion	Eliminate the risks associated with gas chlorine.	OUC	5,936
OUC	Ozone Generator Program	Replacement of the ozone generators nearing life expectancy and/or having serviceability issues.	OUC	37,408
OUC	Inter-Agency Projects	Required projects that are scheduled to coincide with FDOT, Orange County, or the City of Orlando's infrastructure improvements.	OUC	27,487
OUC	Other Transmission and Distribution Projects	Other pipelines and extensions, main installations to close loops to improve water quality or pressure, OUC up-sizing of developer pipes, etc.	OUC	15,480
OUC	Donated Water Transmission & Distribution	Water transmission and distribution facilities for new customers constructed and donated to OUC.	OUC	16,500
OUC	Constructed Water Transmission & Distribution	OUC provided water mains, hydrants, services, and meters for new development.	OUC	4,403

Proposed GMP Text Amendments

Proposed Potable Water, Wastewater, Intergovernmental Coordination, Stormwater and Aquifer and Conservation Elements' GMP Goal, Objective, and Policy Amendments

Proposed Potable Water GMP Amendments

- Policy 1.1.2 OUC shall periodically monitor and inspect its potable water wells to ensure they are in good repair and are not acting as conduits to potentially contaminated water. ~~inspect its potable water well casings to ensure they are in good repair and are not acting as conduits to potentially contaminated water.~~
(Amended February 7, 2000, Effective March 9, 2000, Doc. No. 32636)
- Objective 1.2 In addition to the significant reduction in per capita demand already achieved since 2004, ~~the City shall reduce total per capita potable water demand by an additional 7.3 percent between 200417 to 201520, and an additional 4 percent by 202040.~~
(Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004)
- Policy 1.2.1 In order to conserve potable water supplies throughout the planning period, the City Landscaping Code and its water conservation requirements shall apply. ~~maintain regulations that require water reduction devices in new development, require Xeriscaping for all development except one and two family building sites, and decrease use of potable water supplies for nonpotable water uses.~~
The City shall continue to improve conservation rates by periodically updating the Building Code and Land Development Code to incorporate advances in water conservation practices.
(Amended January 22, 2007, Effective April 9, 2007 Doc. No. 0701221004)
- Policy 1.2.3 The City shall reduce the use of potable water for irrigation purposes throughout the planning period by adopting and enforcing regulations that require property owners in the reclaimed water service area to connect to the reclaimed water network where available feasible. When determining reclaimed water feasibility the availability of reclaimed water and the net reduction in potable water use shall be considered (when potable water saved is greater than potable water flushing for water quality).
(Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004)

- Policy 1.2.8 ~~The City shall review and consider adopting the SJRWMD Model Landscape Water Management Ordinance by January 1, 2009. (Reserved)~~
(Amended January 22, 2007, Effective April 9, 2007, Doc. No.0701221004)
- Policy 1.2.9 OUC shall promote water conservation through ~~television and radio advertising, website information and other outreach efforts~~ multi-media outreach activities and supporting educational efforts, including television and radio advertising, website information and other outreach initiatives.
(Amended July 7, 2008, Effective September 30, 2008, Doc. No. 0807071004)
- Objective 1.3 The City shall cooperate in implementing ~~SJRWMD's District Water Supply Plan and SFWMD's Kissimmee Basin Water Supply Plan~~ Central Florida Water Initiative Water Regional Water Supply Plan through ~~normal~~ regular OUC/Water Management District coordination and jurisdictional authority, throughout the planning period and through adoption of the City's Water Supply Facilities Work Plan. The City shall adopt and maintain the Water Supply Facilities Work Plan for at least a 10-year planning period. The Water Supply Facilities Work Plan, dated ~~July 7, 2008~~ is adoption date to be inserted herein adopted, by reference. The Water Supply Facilities Work Plan provides data and analysis necessary to support the goals, objectives and policies in this element. A 10-year schedule of water supply projects needed to meet demand in the Plan is provided in Figure PW-3. Supporting data and analysis may be attached as appendices to the Water Supply Facilities Work Plan, and updated from time to time, without the necessity of an amendment to the Growth Management Plan.
(Amended May 16, 1994, Effective July 28, 1994, Doc. No. 27538; Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004; Amended July 7, 2008, Effective September 30, 2008, Doc. No. 0807071004; Amended June 8, 2009, Effective August 25, 2009, Doc. No. 0906081103)
- Policy 1.3.1 The City shall, through the mandated operating procedures of the Orlando Utilities Commission, and through adoption of the City's Water Supply Facilities Work Plan, cooperate in implementing the State's Water Supply Plan, ~~the SJRWMD Water Supply Plan and SFWMD Water Supply Plan~~ and the regional Central Florida Water Initiative Regional Water Supply Plan.
(Amended May 16, 1994, Effective July 28, 1994, Doc. No. 27538; Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004)

- Policy 1.3.2 The City shall update its Water Supply Facilities Work Plan within eighteen months after the adoption of the ~~SFWMD's Kissimmee Basin Water Supply Plan, or the SJRWMD's District Water Supply Plan, whichever is adopted last~~ Central Florida Water Initiative Regional Water Supply Plan, pursuant to the adoption schedule of the South Florida Water Management District and St. Johns River Water Management District.
(Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004)
- Policy 1.8.1 In order to conserve potable water supplies throughout the planning period, the City shall maintain Landscaping Code regulations as detailed in the Landscaping Development Code that require water reduction devices in new development, ~~require Xeriscaping for all development except for one and two family building sites,~~ and decrease use of potable water supplies for non-potable water uses.
- The City shall continue to improve conservation rates by periodically updating the Building Code and Land Development Code to incorporate advances in water conservation practices.
(Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004)
- Policy 1.8.2 The City shall coordinate with OUC to implement feasible alternative water supply projects as identified in the ~~SJRWMD's District Water Supply Plan, the SFWMD's Kissimmee Basin Water Supply Plan~~ Central Florida Water Initiative (CFWI), and the City's Water Supply Facilities Work Plan.
(Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004)

Proposed Wastewater GMP Amendments

- GOAL 2** ~~To R~~ Reduce the environmental impacts of the City's wastewater system upon land and water resources, encourage water conservation, promote beneficial reuse of reclaimed water and biosolids, and phase out onsite septic and treatment systems.
- Objective 2.1** The City shall evaluate the ~~need for modifying effluent~~ utilization of reclaimed water ~~practices at Water Conserv I, Water Conserv II, and Iron Bridge on an annual basis. The City shall review the existing reclaimed water systems, including public access distribution, wetland, and groundwater recharge systems~~ effluent utilization methods, alternative methods and technologies, and the Future Land Use Map Series to determine possible

~~impacts and future needs, upgrades, and expansion. This e annual study shall include, but not be limited to:~~

- a. ~~Implications of the Orlando Beltway-Wekiva Parkway, the Horizons West, project and changing land uses within the Water Conserv II Water Reclamation Facility service area. meteorological conditions upon the availability of citrus groves for effluent disposal for Water Conserv II and recommendations for alternative methods.~~
- b. ~~Development of A a long term sludge biosolids management program, which is reliable, environmentally sound promotes beneficial reuse, and can responds to changes in governmental regulations.~~
- c. ~~The Implications of the Southeast Area Annexations development and annexations in the southeast quadrant of the wastewater service area upon the capacity, operations, and needs of the Water Conserv I facility wastewater system.~~
- d. Encouragement of conservation and efficient utilization of reclaimed water with innovative and efficient system operations, and measures for reducing water use and proper landscaping.

(Amended February 7, 2000, Effective March 9, 2000, Doc. No. 32636; Amended June 8, 2009, Effective August 25, 2009, Doc. NO. 0906081103)

Policy 2.1.1

The City shall conduct informational and educational campaigns to encourage industrial/commercial customers ~~within the City service areas~~ to implement water conservation programs or to use reclaimed water where practical, and economically feasible, and allowed in accordance with Chapter 62-640, F.A.C.

(Amended June 8, 2009, Effective August 25, 2009, Doc. No. 0906081103)

Policy 2.2.3

The City shall coordinate with OUC to provide reclaimed water ~~as stipulated in Conditions 36 and 37 of OUC's Consumptive Use Permit (CUP) #3149. These conditions require that the City provide a minimum of 11.1 million gallons per day of reclaimed water by 2020 and construct Project RENEW to provide 9.2 million gallons per day of reclaimed water to western Orange County by 2015 through the Project Renew project, as detailed in Consumptive Use Permit (CUP) #3149.~~

(Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004)

Policy 2.2.4 The City shall encourage water conservation, promote beneficial reuse of reclaimed water, and implement policies and programs for innovative conservation and use of reclaimed water as detailed in the Central Florida Water Initiative Regional Water Supply Plan and other practices.

Proposed Intergovernmental Coordination GMP Amendments

Policy 2.4.2 ~~The City shall coordinate with OUC to provide reclaimed water as stipulated in Conditions 36 and 37 of OUC's Consumptive Use Permit (CUP) #3149. These conditions require that the City provide a minimum of 11.1 million gallons per day of reclaimed water by 2020 and construct Project RENEW to provide 9.2 million gallons per day of reclaimed water to western Orange County by 2015 through the Project Renew project, as detailed in OUC's Consumptive Use Permit (CUP) #3149.~~

(Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004)

Policy 2.4.3 The City shall coordinate with OUC to implement water conservation measures consistent with recommendations from the Central Florida Water Initiative Regional Water Supply Plan and St Johns River and South Florida Water Management Districts sufficient to meet goals provided in OUC's Consumptive Use Permit.

(Amended January 22, 2007, Effective April 9, 2007, Doc. No. 0701221004)

Proposed Stormwater and Aquifer Recharge GMP Amendment

Policy 1.1.7 The City of Orlando, consistent with OUC implementation practices, shall implement best practices identified in the Central Florida Water Initiative Regional Water Supply Plan, which address stormwater and conservation practices.

Proposed Conservation GMP Amendment

Policy 1.1.7 The City of Orlando shall implement best practices as identified in the Central Florida Water Initiative Water Supply Facilities Plan, to maintain and enhance a healthy ecosystem, including aquifers, lakes, streams, and wetlands.

This page has been left blank.

APPENDIX B

Orlando Utilities Commission (OUC) and Operations

APPENDIX B

ORLANDO UTILITIES COMMISSION (OUC)

Facilities

Orlando Utilities Commission (OUC) is the municipal utility of the City of Orlando that provides water, electric and chilled water services. OUC's water service area measures approximately 200 square miles which includes the Cities of Orlando, Edgewood and Belle Isle plus large portions of unincorporated Orange County. (See Figure 5 on page 9 for a map of OUC's Potable Water Service Area).

There are seven water supply/treatment facilities within the OUC water service area. Each facility includes wells, ozone generating equipment, ozone contact tanks, chemical feed equipment, ground storage reservoirs, high service pumps, control equipment, and emergency power facilities to run the plant in the event of an extended power outage. [Table A.1](#) includes wellfield and treatment capacity information for each of OUC's seven facilities. OUC's Southeast facility repumps water in the distribution system in order to maintain pressures in the extreme Southeast portions of the service area, including Lake Nona.

Table A.1.: OUC Water Supply Facilities

Facility Name	Raw Water Source	Wellfield (Raw/Source Water)		Treatment (Finished Water)	
		Current Maximum Capacity (mgd)	Current Average Day Capacity (mgd, AADF)	Current Maximum Capacity (mgd)	Current Average Day Capacity (mgd, AADF)
Pine Hills WSF	Lower Floridan	26.2	18.7	25.0	17.9
Kirkman WSF	Lower Floridan	17.3	12.4	15.0	10.7
Southwest WSF	Lower Floridan	45.5	32.5	40.0	28.6
Lake Highland WSF	Lower Floridan	28.1	20.1	30.4	21.7
Sky Lake WSF	Lower Floridan	22.5	16.1	22.5	16.1
Navy WSF	Lower Floridan	10.0	7.1	10.0	7.1
Conway WSF	Lower Floridan	31.0	22.1	26.8	19.1
Total OUC Existing Capacity		180.6	129	169.7	121.2

All OUC wells tap into the Lower Florida aquifer extending over 1,100 feet below the surface. The Lower Floridan aquifer is a source of very high quality water that requires minimum treatment. The only constituent in the raw water that requires treatment is hydrogen sulfide, a gas with an offensive odor that is easily removed by the ozone treatment equipment. OUC performs rigorous testing of the water it pumps from the aquifer to make sure that it is free from contaminants and suitable for treatment using the ozone treatment process.

There are approximately 1,800 miles of transmission/distribution pipes ranging in size from 2 inches to 48 inches. The figure below shows OUC’s transmission /distribution network for pipes 12-inches in diameter or larger (Exhibit A-1).

Table A-2, next page, shows the pipe length in miles for the various size pipes and provides the number of water service connections, fire hydrants, and elevated storage tank capacities. One of the functions of this network is to interconnect all the water supply/treatment facilities with each other. There are three elevated water storage tanks connected to the transmission/distribution system. These tanks help maintain minimum acceptable pressure in the pipe network and supply water into the pipe network during peak demand periods.

OUC has three emergency interconnects with Orange County Utilities which provide emergency sources of water in the event one utility unexpectedly experiences extensive loss of supply sources or treatment facilities. The water can flow either way through an emergency interconnect, depending on which utility needs the water. They are intended to be used only in an emergency and require the cooperation of both utilities to activate them during an emergency.

OUC Water Transmission/Distribution Network

Exhibit A.1.

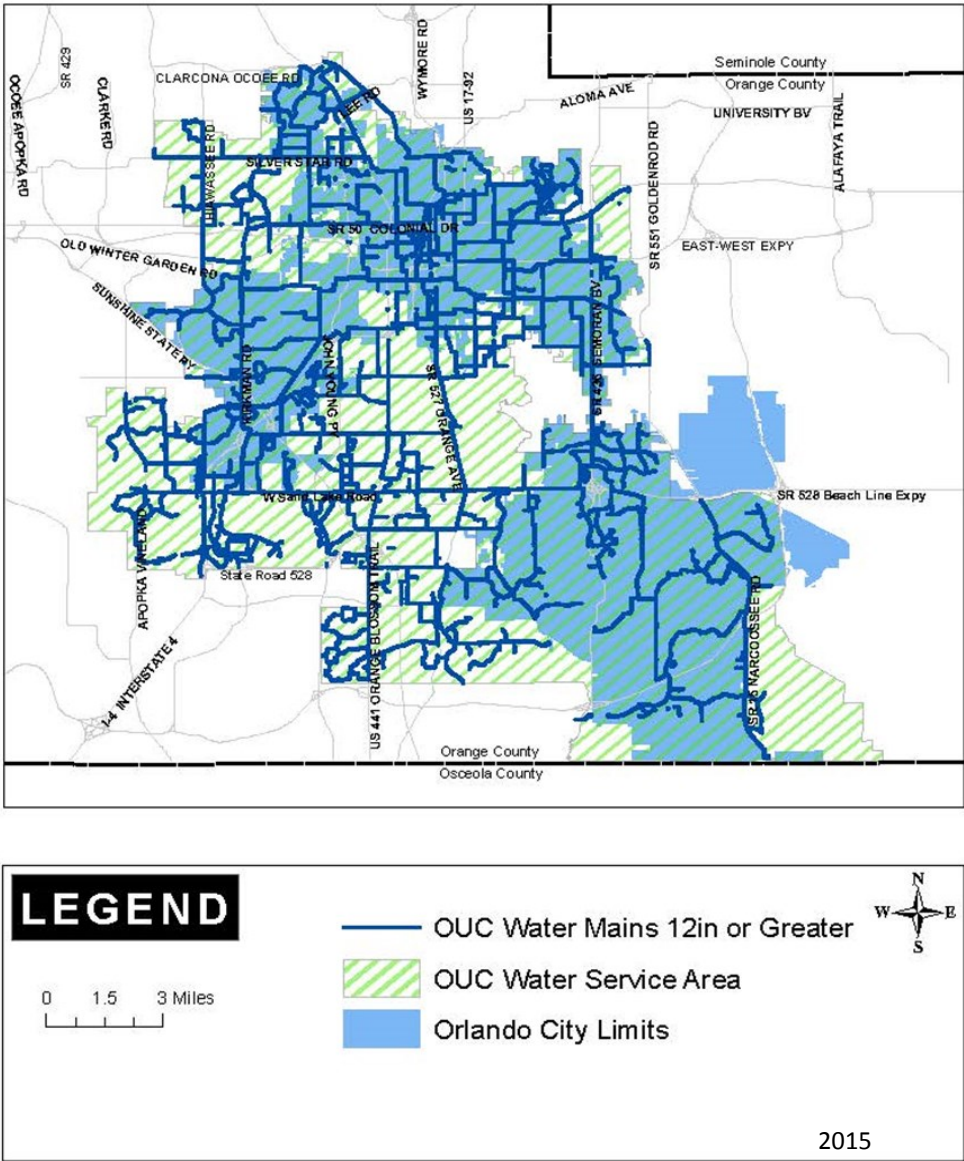


Table A.2.

Pipe Length, by Size, miles	
2" Diameter	224.8
3" and 4" Diameter	167.8
6" Diameter	468.7
8" and 10" Diameter	492.5
12" Diameter	258.1
14" and 16" Diameter	120.2
18" and 20" Diameter	73.3
24" to 48" Diameter	14.9
Total Pipe Length, miles	1820.3
Services, Active Metered, No.	143,000
Fire Hydrants, No.	10,290
Elevated Storage Tanks, Capacity	
Dr. Phillips, gallons	750,000
Hiawassee, gallons	500,000
MetroWest, gallons	300,000
Total Elevated Storage Tank Capacity, gallons	1,550,000

Permits

OUC entered into an interagency agreement with SJRWMD and SFWMD in May 2004 as part of its CUP renewal process. Under this agreement, SFWMD delegated to SJRWMD all of its authority to issue a single, consolidated CUP to OUC. SJRWMD issued CUP # 3159 in May 2004. It is a 20 year duration permit, scheduled to expire in October 2023. In addition to authorizing a consolidated CUP, the interagency agreement allows SJRWMD to issue well construction and ERP permits to OUC, and to enforce OUC's CUP throughout the 20 year duration of the permit. OUC's permit allocates 109.2 mgd of groundwater from the Lower Floridan Aquifer in 2023. In addition to the 109.2 mgd system-wide limitation on groundwater withdrawals, the CUP limits withdrawals at each individual water supply/treatment facility.

In addition to the permit conditions, OUC has legal obligations under two settlement agreements. These agreements concluded several months of litigation brought on by permit challenges filed by Orange County and Lake County in October 2003. One agreement was signed by OUC, Orange County, SJRWMD and SFWMD. It requires that OUC develop at least 5 MGD of water from an alternative supply source, such as Taylor Creek Reservoir, the St. Johns River, or other sources acceptable to the SJRWMD. The agreement anticipates that OUC will pursue alternative water supply development jointly with Orange County, which has a similar obligation under the agreement. OUC also agreed that it would not challenge permits that Orange County has pending with both SJRWMD and SFWMD. The second agreement was signed by OUC and Lake County. Under this agreement, OUC agrees to give Lake County an option to participate in any alternative water supply development project it pursues. This will assure Lake County a place "at the table" as alternative water supply development is discussed in Central Florida in the future.

APPENDIX C

Water Management District Information

Appendix C

In 1972, the Florida Legislature established five water management districts. The State of Florida is divided into five water management districts which were created to preserve and manage water resources. Each district has responsibilities in four broad categories: water supply, water quality, natural systems management and flood protection. The City of Orlando falls within two water management district jurisdictions, the St. Johns River Water Management District (SJRWMD) and the South Florida Water Management District (SFWMD).

St. Johns River Water Management District

The St. Johns River Water Management District (District) encompasses all or part of 18 counties in northeast and east-central Florida that includes 119 local governments and a total population of 4.87 million (as of 2015). The District operates from its headquarters in Palatka, and service centers in Palm Bay, Maitland and Jacksonville. In accordance with Chapters 163 and 373 of the Florida Statutes, the SJRWMD must conduct water supply planning for at least a 20-year planning horizon for those regions where it determines that existing sources of water are not adequate to meet all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems through the planning period.

Historically, SJRWMD has prepared water supply plans that encompass the entire District. However, in order to address local resource concerns, the SJRWMD has changed direction and is developing three water supply plans for five planning/data collection regions, rather than a single district-wide plan. This approach will address local resource concerns expressed by stakeholders, improve planning efficiency and reduce costs. Part of each regional water supply plan will update and include the most recent water supply assessment.

The results of that updated assessment will determine the extent of planning needed for a particular planning region. The three water supply plans include the Central Florida Water Initiative, the North Florida Regional Water Supply Planning Partnership, and the Central Springs and East Cost Planning area. The City of Orlando is situated within the Central Florida Water Initiative area. SJRWMD have initiated development of the 2040 water supply projections for the CFWI 2020 WSP. The SJRWMD historically developed one water supply plan for their entire District, including the Central Florida area. The initial SJRWMD RWSP was completed in 2000 and was updated in 2005 (SJRWMD 2005b); subsequent updates were completed annually from 2006 through 2009 with addenda (SJRWMD 2006a, 2007, 2008, 2009b). SJRWMD's water supply planning and assessment investigations have documented that the rate of withdrawal of groundwater in certain areas of SJRWMD is approaching the maximum sustainable rate that will cause unacceptable adverse impacts to the water resources and related natural systems. Previous plans generally placed this region in a water resource caution area. To meet the future water use demands in the SJRWMD, the RWSP identified several water supply and water resource development options/projects. These included increased use of reclaimed water, development of brackish groundwater sources, surface water storage through reservoirs, and conservation.

South Florida Water Management District

The boundaries of the District encompass all or part of 16 south Florida counties, covering a total area of 17,930 square miles. Approximately 8.1 million people live within the District's boundaries. The portion of the SFWMD that falls in the CFWI Planning Area has been included in the Kissimmee Basin Water Supply Plan (KBWSP). The initial KBWSP was completed in 2000 (SFWMD 2000) and was updated in 2006 (2005-2006 KB Plan Update; SFWMD 2006a, 2006b). The 2005-2006 KB Plan Update supported the 2000 Kissimmee Basin Water Supply Plan's (2000 KB Plan) findings and recommendations, which called for development of alternative water sources to meet most of the region's future water supply needs through 2025.

Fresh groundwater from the Floridan aquifer system and groundwater from the surficial aquifer system served the Kissimmee Basin (KB) Planning Area as traditional water sources (SFWMD 2006a). The 2005-2006 KB Plan Update concluded that increased conservation and the development of alternative water supplies were needed to meet water needs, as further development of traditional supplies becomes increasingly limited. The alternative water supply source options identified for the KB Planning Area included brackish groundwater; fresh surface water from the Kissimmee River and Chain of Lakes and associated tributaries; stormwater runoff collection and storage; and reclaimed water.

Appendix C

Florida's five water management districts

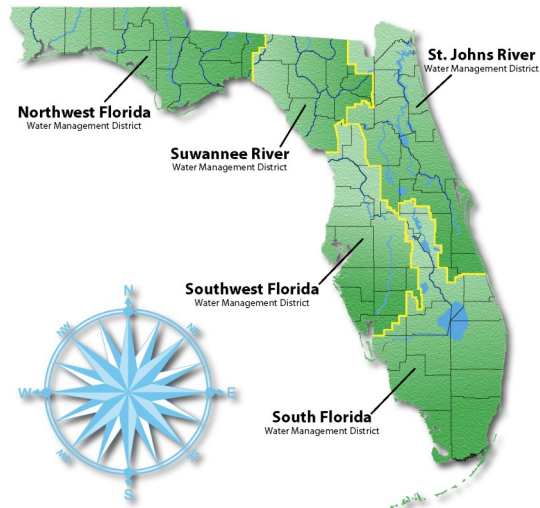


Exhibit 1.2: WMD Maps

