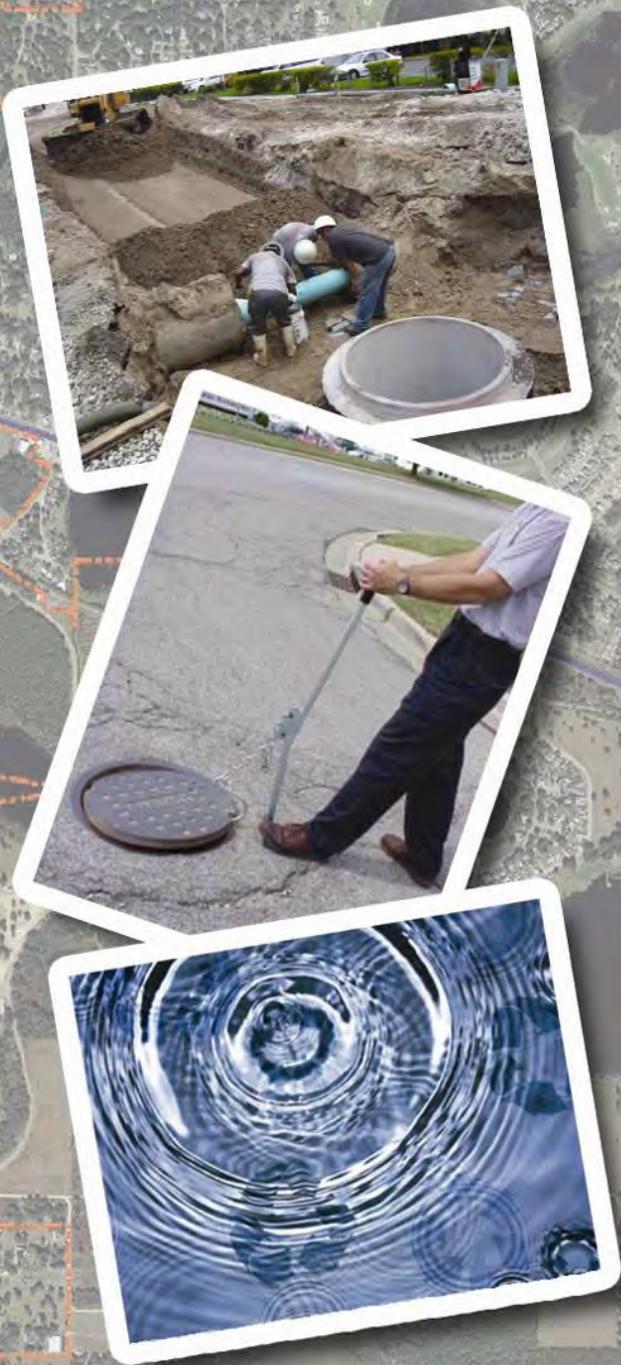


# City of Apopka

## Comprehensive Plan 2030



### Infrastructure Element



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# **INFRASTRUCTURE ELEMENT**

## **INTRODUCTION**

### **PURPOSE AND SCOPE**

The purpose of the Infrastructure Element is to provide for necessary public facilities and services correlated to future land use projections. This element addresses potable water, sanitary sewer, stormwater management and solid waste facilities provided by the City of Apopka within its corporate limits or within an established service area. This element also identifies areas of prime or high natural groundwater aquifer recharge areas and the City's programs to protect the function of these areas.

For the purposes of the Infrastructure Element, the population projections used to estimate future demands on the facilities are developed for the entire area located within the utility service area. An explanation of the methodologies used is provided in the Future Land Use Element.

### **REGULATORY FRAMEWORK**

The enforcement of potable water, sanitary sewer and stormwater management infrastructure falls under the regulatory framework of three government agencies - the Florida Department of Environmental Protection (FDEP), the St. Johns River Water Management District (SJRWMD), and the Florida Department of Health (FDOH).

#### **Florida Department of Environmental Protection (FDEP)**

To assure that public water systems supply drinking water which meets minimum requirements, the federal government enacted PL 93-523, the "Safe Drinking Water Act." The Florida Legislature enacted the "Florida Safe Drinking Water Act," sections 403.850-403.864, Florida Statutes (F.S.). Chapter 62-550, Florida Administrative Code (F.A.C.), sets the drinking water standards, monitoring requirements and treatment techniques to be met by public water systems and the testing protocol required for certified laboratories.

According to Chapter 403, F.S. unless exempted by rule or statute, any facility or activity that discharges wastes into waters of the state or which will reasonably be expected to be a source of water pollution must obtain a permit from the FDEP. Generally, persons who intend to collect, transmit, treat, dispose or reuse wastewater are required to obtain a wastewater permit. A wastewater permit issued by the FDEP is required for both operation and certain construction activities associated with domestic or industrial

wastewater facilities or activities. A FDEP permit must also be obtained prior to construction of a domestic wastewater collection and transmission system.

Wastewater facilities that are authorized to discharge to surface water are subject to the FDEP's federally authorized National Pollutant Discharge Elimination System (NPDES) permitting requirements. However, many of these NPDES facilities also discharge to groundwater. The remaining facilities are authorized solely as groundwater discharges through land-application, beneficial reuse of reclaimed water or deep well injection.

#### **St. Johns River Water Management District (SJRWMD)**

The rules in Chapter 40C-20, F.A.C., establish a general consumptive use permitting program for certain water uses whose adverse impact, either singly or cumulatively, on the water resources of the District is determined to be minimal. Consumptive uses of waters which are non-exempt, which do not exceed 500,000 gallons per day calculated as an annual average, and which do not qualify for a general permit by rule under section 40C-2.042, F.A.C., or a noticed general permit under Chapter 40C-22, F.A.C., require a standard general permit under this chapter.

#### **Florida Department of Health**

Section 381.261, F.S., gives general supervision and control over all private water systems and public water systems not covered or included in the Florida Safe Drinking Water Act to the Department of Health (DOH). The DOH interprets this as meaning that it has supervision and control of all water systems which meet all of the four exception criteria and which also have at least 15 service connections or which regularly serve at least 25 individuals daily at least 60 days out of the year. The DOH also interprets Section 381.261, F.S., as meaning that it has supervision and control of all water systems that have less than 15 service connections or which regularly serve less than 25 individuals daily at least 60 days out of the year, or at least 25 individuals daily less than 60 days out of the year.

#### **UTILITY SERVICE AREA**

The City of Apopka provides potable water and sanitary sewer collection, treatment and distribution to its municipal limits and to lands outside of the City boundary within its utility service area that includes adjacent unincorporated areas. The current boundary of the water service area is shown in **Map 4-1** while the sanitary sewer service area is shown in **Map 4-2**. The utility service area boundary was established in the "City of Apopka/Orange

County Amended and Restated Water, Wastewater, and Reclaimed Water dated December 16, 2004. The agreement also allows for the expansion of the service area should the City limits expand beyond the area delineated. Other exceptions dealing with existing service and the ability to provide service are incorporated into the interlocal agreement. The County may also serve utility customers within the Adjacent Territorial Area even after they are annex into the City of Apopka. Currently there is a small area that is served by the County within the City limits. Water demands for this area are not calculated within the City of Apopka calculations because they are calculated within Orange County calculations. The agreement does not address stormwater management and solid waste services. The City of Apopka does not reserve future water and sewer capacity for specific uses within the City or in the Orange County portions of the utility service area. Capacities in the water and sewer system are allocated by the City as applications are received for capacity irrespective of the applicant's location within the utility service area.

## POTABLE WATER SUB-ELEMENT

### INTRODUCTION

The traditional source of drinking water for Central Florida has been the Floridan aquifer, an artesian aquifer that covers approximately 100,000 square miles and supplies the state with its potable water. As with all sources of fresh water, the Floridan aquifer is a limited resource. Due to the unprecedented growth seen throughout the state, four of the five water management districts have acknowledged there is soon to be a significant shortage between the potable water demand and available supply.

As a result, the Florida Legislature enacted bills in 2002, 2004 and 2005 that essentially require conformity between all future land use planning and water supply planning. Based on the most recent legislation, all local governments were required to revise their comprehensive plans after the approval of the regional water supply plan. The city's water supply facilities work plan has been updated and addresses the future needs of the City through 2030.

### EXISTING WATER SYSTEM CONDITIONS

#### OPERATIONAL RESPONSIBILITY

The City of Apopka owns, operates and maintains five water plants having an interconnected water distribution system. The City's water system has two important purposes including the provision of water for human consumption and the provision of water for fire fighting purposes. The City Public Services Department is responsible for the operations and maintenance of the central public water system

#### SERVICE AREA AND PREDOMINANT USERS

The utility service area for Apopka's water system is described in the Introduction to this element and shown in **Map 4-1**.

The City serviced approximately 47,570 water customers in 2006. **Table 4-1** identifies the water use by customer type in 2008, with residential use the largest consumer. **Table 4-2** lists the predominant potable water users in 2008 in the utility service area.

**TABLE 4-1: 2008 WATER USE BY CUSTOMER TYPE**

| Type of User              | Water Consumption mgal      | Water Consumption mgd | Percentage of Total Consumption |
|---------------------------|-----------------------------|-----------------------|---------------------------------|
| Single Family Residential | 2095.109 <sup>1</sup>       | 5.74                  | 80.0%                           |
| Multi-Family              | 33.096                      | 0.09                  | 1.3%                            |
| Commercial                | 385.385                     | 1.06                  | 14.7%                           |
| Irrigation                | 107.547 <sup>2</sup>        | 0.29                  | 4.0%                            |
| <b>Totals</b>             | <b>2621.137<sup>3</sup></b> | <b>7.18</b>           | <b>100.0%</b>                   |

**SOURCE: CITY OF APOPKA DECEMBER 17, 2009**

<sup>1</sup>Includes Residential Irrigation Demand

<sup>2</sup>Represents Multi-Family and Commercial Irrigation

<sup>3</sup>By the end of 1<sup>st</sup> Quarter 2008 the City Completed the Automated Meter Reading (AMR) Change Out Program with the Exception of Some Large Meters

**TABLE 4-2: 2008 PREDOMINANT WATER USERS**

| User  | Water Consumption mgal |
|---|------------------------|
| Zellwood Station Association                            | 111.498                |
| Triquint  | 35.724                 |
| Willow Lake Apartments                                  | 28.346                 |
| Piedmont Lakes Middle School                            | 15.179                 |
| Palmetto Bay Associates<br>AKA: Orange North Apartments | 10.756                 |
| Palm Key Apartments                                     | 9.545                  |
| Cocoa Cola  | 8.342                  |
| Wolfe Lake Middle School                                | 7.961                  |
| World O'Suds Laundry                                    | 7.261                  |
| Apopka High School                                      | 7.008                  |
| <b>Totals</b>   | <b>242.620</b>         |

**Source: City of Apopka December 17, 2009**

## **PUBLIC WATER SYSTEM FACILITIES**

The City's public water system has three major components: 1) water production; 2) treatment; and 3) pumping. The locations of the City's water plants are shown in **Map 4-1**. The system is comprised of five water plants and the associated storage and distribution facilities. The City provides all potable and reclaimed water within the utility service area.=

The largest water plant located within the Apopka City limits is the Jack G. Grossenbacher Water Plant, which was expanded and upgraded in 1986 and is located near Park Avenue just north of the intersection with Martin Street. The other water plant located within the City's municipal boundaries is the Sheeler Oaks Water Plant, which is located in the Sheeler Oaks subdivision and was constructed in 1984. The City constructed its newest water plant, the Myrtle Rogers Womble Water Plant (previously known as the Northwest Water Plant) in 1999, which is located at 3100 Pitman Road in the northwestern part of the City.

With the purchase of Plymouth Regional and Mount Plymouth Lakes water facilities from Orange County, two additional water plants were added to the Apopka system. The Plymouth Regional water plant is located in the western portion of the utility service area and currently serves a few small residential communities as well as commercial and industrial users along West Orange Blossom Trail. The Mount Plymouth Lakes water plant is located in the northeastern portion of the service area and currently serves several small residential communities near the Wekiva Springs State Park.

**Table 4-3** summarizes the facilities at each of the City's water plants. All raw water is obtained from deep wells except one well at Grossenbacher Water Plant, the three wells at Plymouth Regional and the two wells at Mount Plymouth. All of the water plants operated by the City provide chlorination treatment for disinfection. Like most wells drilled into the Floridan aquifer in the central Florida area, hydrogen sulfide is present in the City's well water. The Myrtle Rogers Womble, Mount Plymouth, Sheeler Oaks and Grossenbacher plants provide aeration and detention treatment for hydrogen sulfide removal. Water is pumped out of the wells, through an aeration device and into the storage tanks. Water is pumped from the storage tanks into the water distribution system by the high service pumps.

**TABLE 4-3: SUMMARY OF EXISTING WATER FACILITIES**

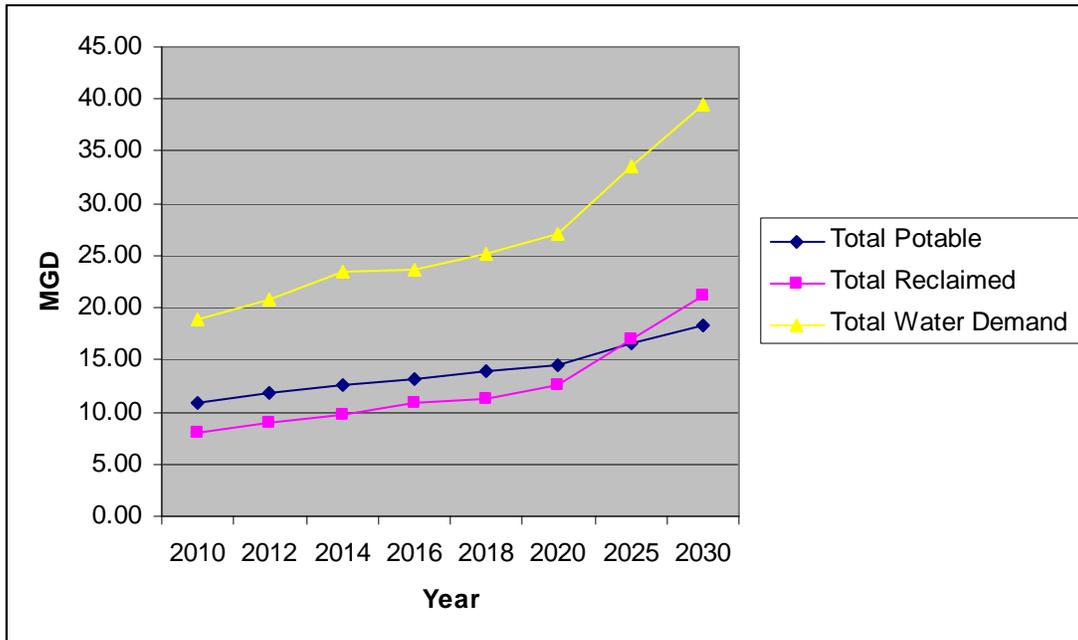
| Plant                | Rated Well Pump Capacity (gpm) | Well Casing Size (in) | High Service Pumps (gpm) | Total High Service Pumping Capacity (gpm) | Total High Service Firm Pumping Capacity (gpm) | Type of Storage | Storage Capacity (mgal) | Treatment             |
|----------------------|--------------------------------|-----------------------|--------------------------|---|--|-----------------|-------------------------|-----------------------|
| Myrtle Rogers Womble | 3,500                          | 24                    | 2,500                    | 5,000                                     | 2,500  | Ground          | 1.0                     | Aeration Chlorination |
|                      | 3,500                          | 24                    | 2,500                    |   |  |                 |                         |                       |
| Grossenbacher        | 1,000                          | 12                    | 2,400                    | 12,900                                    | 9,400  | Ground          | 0.5                     | Aeration Chlorination |
|                      | 3,500                          | 20                    | 3,500                    |   |  |                 | 1.0                     |                       |
|                      | 3,500                          | 20                    | 3,500                    |   |  |                 |                         |                       |
| Sheeler Oaks         | 2,500                          | 18                    | 1,950                    | 6,650                                     | 4,700  | Ground          | 1.0                     | Aeration Chlorination |
|                      | 2,500                          | 18                    | 1,950                    |   |  |                 |                         |                       |
|                      |                                |                       | 1,500                    |   |  |                 |                         |                       |
| Plymouth Regional    | 400                            | 8                     | 1,800                    | 4,400                                     | 2,600  | Ground          | 0.75                    | Chlorination          |
|                      | 500                            | 14                    | 1,800                    |   |  |                 |                         |                       |
|                      | 500                            | 14                    | 400                      |   |  |                 |                         |                       |
| Mount Plymouth       | 1,000                          | 12                    | 1,000                    | 3,580                                     | 2,580  | Ground          | 0.5                     | Aeration Chlorination |
|                      | 1,000                          | 10                    | 1,000                    |   |  |                 |                         |                       |
|                      |                                |                       | 580                      |   |  |                 |                         |                       |
| <b>Total System</b>  | <b>23,400</b>                  |                       |                          | <b>32,530</b>                             | <b>21,780</b>                                  |                 | <b>4.75</b>             |                       |

Storage is an important component of the City's water system. The Grossenbacher plant has 1.5 million gallons of storage capacity, the Sheeler Oaks Plant has 1.0 million gallons of storage and the myrtle Rogers Womble Plant has 1.0 million gallons of storage. Plymouth Regional has 0.75 million gallons and Mouth Plymouth Lakes has a 0.50-million gallon storage capacity. All of the City's storage capacity is provided by reinforced concrete tanks. The water in these tanks is available for emergency conditions such as fire flow demands and for operational purposes. There are a total of six ground storage tanks within the City's distribution systems with a combined capacity of 4.75 million gallons.

The City's water plants are interconnected by pipes in the distribution system. If a single plant is temporarily out of service, water can generally be supplied to that plant's service area from the other water plant. The City has a Consumptive Use Permit (CUP) issued by the St. Johns River Water Management District for withdrawal of groundwater in the amount of 10.358 million gallons per year, which equates to an average withdrawal rate of 3,780.70 million gallons per day (mgd). Per the Water Supply Facilities Work Plan, 2008, the City has a CUP from the District for its potable water system. The CUP has been recently negotiated to combine Permit numbers 3217, 50172, and 100495 under one CUP numbered 3217. The City's CUP is currently approved by SJRWMD on a year-to-year basis until the review process and final approval is completed. The projected average day demand rate during calendar year 2008 was 7.307 mgd. The renewal of the CUP is under review by the SJRWMD.

Water plants are designed to supply and treat the maximum daily flow of water. Generally, the capacity of a water plant is determined by well capacity or treatment capacity. The capacity of the City's water plants is presently determined by well capacity. The City's total estimated well capacity in 2008 was 23,400 gpm or 33.70 mgd. The maximum daily flow recorded in 2009 was 14.677 mgd. **Figure 4 1** provides a summary of the maximum daily flows.

**FIGURE 4 - 1: WATER DEMAND SUMMARY**



The high service pumps located at each water plant are used to maintain water pressure by pumping water into the distribution system. High service pump capacity is usually rated by assuming that the largest pump is out of service. This is done to provide a better degree of reliability for the water system. In addition to normal demands for water, the high service pumps must also be capable of sustaining emergency water demands for fire fighting purposes. Emergency power generators are located at each of the water plants to provide limited capacity during a power outage.

The quality of the water produced by the City is monitored by the Florida Department of Environmental Protection (FDEP). At regular intervals, the City submits monitoring reports to the FDEP in accordance with state regulations.

The expected service life for the reinforced concrete structures and buildings at the water plants is 30 to 50 years depending on the level of maintenance provided. The expected service life for the mechanical equipment such as the high service pumps is 15 to 20 years depending on the level of maintenance provided. Some equipment items may have to be replaced more frequently as part of routine maintenance.

## **DISTRIBUTION SYSTEM**

The existing water distribution system contains pipes ranging in diameter from three inches to 36 inches, fire hydrants and isolation valves. Generally, water mains installed in recent years have been 6 inches or larger in diameter. Ductile iron (DIP, high density polyethylene (HDPE) and polyvinyl chloride (PVC) are the pipe materials that are currently used for the City's water mains.

The service life for water mains is variable and depends on pipe material, soil conditions, construction methods and other factors. Generally, the majority of the pipes that compose the City's water system are expected to have a remaining useful life of 20 to 50 years.

## **OPERATION AND MAINTENANCE**

Proper operations and maintenance are essential to providing a safe and reliable water system. The City's water facilities are operated and maintained under the supervision of operators who are certified by the State of Florida.

City crews routinely exercise valves in the water distribution system by opening and closing the valve through several cycles. Valves that do not operate freely are repaired or replaced. Routine flushing of water pipes is another technique the City uses to obtain better performance from the water distribution system. Cleaning the pipes by flushing removes materials that may restrict flow.

## **UNACCOUNTED-FOR WATER**

Unaccounted-for water is the difference between the volume of water pumped into the water distribution system and the volume of water billed. For medium-sized water systems, a commonly accepted range for unaccounted-for water is 10 to 15 percent of the total water pumped. During 2009, the average daily volume of water that was pumped into the water distribution system was 7.571 million gallons. However, the average daily volume of water billed (household and commercial/industrial) and used by unmetered services such as fire protection and utility main flushing during 2009 was 6.905 million gallons. The unaccounted for water in 2009 was 0.666 mgd. This level of unaccounted-for water falls within the accepted range.

There are several potential reasons for unaccounted-for water including the following:

- Non-metered illicit connections;
- Leakages in the water distribution system; and
- Improperly working water meters.

Although unaccounted-for water falls within the acceptable range, the City has taken the following steps to improve the accountability of water:

- Institution of a leakage detection program;
- Institution of an automatic meter reading (AMR) meter change-out programs for all users;
- Annual calibration of the flow meters at the water plants; and
- Elimination of non-permitted connections.

There are tangible benefits to reducing unaccounted-for water. If it is discovered that pipeline leakage is a major component of the unaccounted-for water and that there are cost-effective repairs to eliminate the leakage, then significant water recovery potentially can be realized. This recovered water can then be used to satisfy future water demands.

In 2007, the City took further steps to address potential customer water leaks and other unaccounted-for water anomalies by implementing access to the user's account with a two-year history record. The City replaced the "touch-and-read" meters with advanced technology automatic meter reading (AMR) radio meters. Utility customers can review billing records in real time to evaluate water consumption, thereby encouraging water conservation practices.

#### **WATER CONSERVATION**

Water conservation can be beneficial in several ways. These include:

- Prolonged ability of existing water treatment and distribution facilities to meet future needs; and
- Potential reduction in the volume of water entering the sewer system, which prolongs the ability of wastewater collection, treatment and reclamation facilities to meet future needs.

Water conservation can be accomplished using a variety of techniques. Generally, a water conservation plan is prepared that identifies the most cost-effective water conservation measures for

a particular situation. Some of the most common water conservation measures include the following:

- Public education programs on wise water use and conservation, including public education programs on the use of drought tolerant landscape materials;
- Retrofitting existing homes and buildings with flow limiting devices;
- Requiring new construction to use water saving plumbing fixtures; and
- Structuring water rates so that excessive users of water are penalized.

The City supports the need to conserve water resources and has submitted a formal water conservation plan as part of the CUP requirements. In May 2008, the City adopted its landscape ordinance to include water-wise irrigation practices and the application of Florida-friendly landscape practices.

#### **AQUIFER RECHARGE AND WELL HEAD PROTECTION**

The City relies on the Floridan aquifer for water supply, thus, protection of recharge areas and the protection of groundwater quality are prime concerns of the City. The Floridan aquifer is primarily recharged by rainfall. Direct rainfall and stormwater runoff migrates downward through the porous soils to replenish the groundwater. Recharge areas typically are characterized by well drained soils, which also tend to be well suited for development. However, development potentially restricts recharge capacity by covering the land with impervious surfaces such as roads, parking lots and buildings. The City has adopted SJRWMD's regulation for groundwater recharge requirements.

Generally, wellhead protection is concerned with regulating potential sources of groundwater contamination in the vicinity of water supply wells. Some business activities require the use of chemicals and the disposal of wastes. There is a potential for groundwater contamination by the improper use of chemicals and/or the improper disposal of chemicals and wastes. The City has adopted an ordinance to regulate land use and/or business activity in the vicinity of water supply wells to minimize potential threats to the quality of the groundwater.

#### **FINANCING AND IMPLEMENTING WATER SYSTEM EXPANSION**

Historically, the City's water distribution system has been expanded in accordance with the 2005 Water Master Plan Update.

Generally, expansions that are needed by new growth have been paid for by the developer. If a water main must be extended to serve a new development project and it is considered cost effective, the City may enter into a pipe oversizing agreement with the developer to have the water main constructed at the size called for in the water master plan. Typically, under such oversizing agreements, the City pays only for the difference in the cost of materials between the pipe size needed to serve the development project and the pipe size called for in the master plan.

All costs associated with the water distribution system within a development site are the responsibility of the developer and must be designed and constructed in accordance with the Apopka Land Development Code (LDC). The City takes ownership and the maintenance of the on-site facilities after they have been dedicated to the City by the developer.

The City collects impact fees from developers to pay for the design and construction of new water treatment facilities. Fees are also collected by the City to set water meters and activate service. Operations and maintenance costs for the water system are recovered through the City's water rate structure.

## **POTABLE WATER DATA AND ANALYSIS**

### **EVALUATION OF THE EXISTING WATER DISTRIBUTION SYSTEM**

The City's Fire Department has a goal of providing fire flows of 4000 gpm in light commercial and 6000 gpm in heavy commercial or industrial areas. The Fire Department monitors the fire flow capacity of the water distribution system through a fire hydrant testing program.

Fire flows are an important parameter that must be considered when establishing design criteria for new water system facilities. Generally, they are determined using guidelines published by the Insurance Service Office (ISO), a fire insurance rating organization.

### **EXISTING LEVEL OF SERVICE**

A convenient method for the expression of the level of service for the water system is in terms of gallons furnished per person. **Table 4-4** contains the methodology that was used to develop an estimate of the level of service provided in 2004, 2005 and 2006 the level of service average was 153 gallons per capita per day (gpcd). It is important to note that flows expressed as gpcd include water use by all categories including residential; commercial/industrial/office; public use and unaccounted for water.

**TABLE 4-4: SUMMARY OF EXISTING PER CAPITA WATER FLOWS**

| (a)  | (b)                               | (c)   | (d)                                     | (e)   | (f)                              |
|------|-----------------------------------|---|---|---|----------------------------------|
| Year | Average No. Residential Units (1) | Estimated No. of Persons Per Residential Unit | Estimated No. of Persons Served (c)x(b) | Estimated System Average Daily Flow (mgd) (2) | Per Capita Flow (e/d) (gpcd) (2) |
| 2007 | 20,088                            | 2.80  | 56,246                                  | 8.537   | 152                              |
| 2008 | 18,691                            | 2.80  | 52,335                                  | 8.202   | 157                              |
| 2009 | 18,774                            | 2.80  | 52,567                                  | 7.565   | 144                              |
|      |                                   |   |   | Average                                       | 151                              |

(1) Includes multi-family units. Represents an estimate of the average number of residential units connected to the water system

(2) Includes Residential, commercial/industrial, common area irrigation, fire, water utility and unaccounted water demands

**Source: City of Apopka Public Service Department**

**DEVELOPMENT OF FUTURE LEVELS OF SERVICE**

The future level of service provided by the City's water system will be influenced to some degree by the following:

- The effects of conservation on water consumption,
- The consumption of water by commercial, office and industrial users, and
- The amount of unaccounted for water.

**EXISTING RESIDENTIAL WATER USE**

Based on water usage in 2006, approximately 85.80 percent of the water pumped was used for residential purposes. Thus, residential use was approximately 132 gpcd during 2006. It is anticipated that water conservation will decrease the rate of usage in the future. The City will continue implementation of the water conservation plan. **TABLE 5** shows the projected future residential demands for water.

**TABLE 4-5: PROJECTED POTABLE WATER SUPPLY SOURCES**

| Year | Average Daily Flows      |  |                             | Maximum Daily Flows      |  |                             |
|------|--------------------------|--|-----------------------------|--------------------------|--|-----------------------------|
|      | Projected Flow ADF (MGD) | Existing Floridan Aquifer Supply (MGD) | Other Supplies Needed (MGD) | Projected Flow MDF (MGD) | Existing Floridan Aquifer Supply (MGD) | Other Supplies Needed (MGD) |
| 2010 | 10.925                   | 33.7                                   | 0                           | 27.313                   | 33.7                                   | 0                           |
| 2013 | 12.114                   | 33.7                                   | 0                           | 30.285                   | 33.7                                   | 0                           |
| 2015 | 12.912                   | 38.74                                  | 0                           | 32.280                   | 38.74                                  | 0                           |
| 2020 | 14.542                   | 38.74                                  | 0                           | 36.355                   | 38.74                                  | 0                           |
| 2025 | 16.607                   | 48.82                                  | 0                           | 41.518                   | 48.82                                  | 0                           |
| 2030 | 18.279                   | 48.82                                  | 0                           | 45.698                   | 48.82                                  | 0                           |

Source: Water Supply Facilities Work Plan, 2010

Table 4-6 summarizes the methodology used to project residential water consumption. The projections in Table 4-6 are based on the following assumptions:

- Consistent with the SJRWMD water use criteria for public supply.
- Lower than historical per capita use rates, based on past planning efforts.
- Consistent with the City's commitment for the use of reclaimed water and alternative sources of water irrigation.
- Reflection of the trend toward more aggressive water conservation initiatives.

**TABLE 4-6: SUMMARY OF WATER USAGE**

|  | 2010   | 2015   | 2020    | 2025   | 2030    |
|--|--------|--------|---------|--------|---------|
| Residential Water Use (MGD)                      | 8.230  | 9.740  | 10.970  | 12.550 | 13.840  |
| Commercial/Industrial Office Water Use (MGD)     | 1.312  | -1.553 | 1.749   | 2.001  | 2.206   |
| Irrigation Urban Landscape or Common Areas (MGD) | 0.082  | 0.097  | 0.110   | =0.126 | =0.138  |
| Water Utility (MGD)                              | 0.160  | 0.189  | 0.213   | 0.243  | -0.268  |
| Unaccounted for Water (MGD)                      | 0.721  | 0.853  | 0.960   | 1.097  | 1.207   |
| Zellwood Station (MGD)                           | 0.420  | 0.480  | 0.540   | 0.590  | 0.620   |
| Projected Average Daily Flow (MGD)               | 10.925 | 12.912 | 14.542  | 16.607 | 18.279  |
| Projected Maximum                                | 27.313 | 32.280 | =36.355 | 41.518 | =45.698 |

|  |        |        |        |        |        |
|--|--------|--------|--------|--------|--------|
| Daily Flow (MGD)                           |        |        |        |        |        |
| Projected Peak Hourly Flow (4 x ADF) (MGD) | 43.700 | 51.680 | 58.168 | 66.428 | 73.116 |

Source: Water Supply Facilities Work Plan 2008

**COMMERCIAL/INDUSTRIAL/OFFICE WATER USE PROJECTIONS**

In order to project water use in this category, it was necessary to develop rates that express water usage. Based on the 2010 Water Supply Facilities Work Plan, approximately 1.312 mgd of water was projected in 2010 for this category which counts for 12 percent of the total average daily flows. For planning purposes, we assume the same percentage flows for Years 2010, 2015, 2020, and 2030. An extrapolation from projections of building square footage for the planning period indicate that approximately how much square feet of building area were occupied in the City during 2008. Therefore, commercial, industrial and office users consumed water at an approximate rate of 211 gallons per thousand square feet (400,000 gallons per day vs 1,900 thousand square feet). For planning purposes, a rate of 200 gpd/1,000 square feet was selected to project water usage in the Commercial/Industrial/Office (C/I/O) category.

Generally, businesses have financial incentives to minimize water consumption. Water conservation helps to reduce the cost of their operation and to minimize the amount of wastewater they generate. A reduction in water use due to water conservation in the C/I/O category has not been incorporated into the water use projections.

**UNACCOUNTED-FOR WATER**

Unaccounted-for water must also be included in the water use projections. In 2009 unaccounted for water was 0.666 mgd out of a total of 7.571 mgd or 8.80 percent. The percent unaccounted water is very low; therefore, it was assumed that the percentage of unaccounted for water will remain the same over the planning period as follows:

| Year  | Unaccounted-for Water |
|-------|-----------------------|
| 2015= | 6.61 %                |
| 2020  | 6.60 %                |

Source: Table 2A, June 2010, CUP Application

**FUTURE DEMAND FACTORS**

The maximum daily flow (MDF) and peak hourly flow (PHF) are

important flow parameters for a water system. As previously mentioned, the City's water production and high service pump capacities must be equal to or greater than the MDF and the PHF, respectively. Typically, as a water system enlarges, the MDFs and PHFs will not be as pronounced when compared to the average daily flow (ADF). Therefore, the factors that were used to project maximum daily and peak hourly flows decrease slightly through the planning period as follows:

| Year | MDF<br>(MGD) | PHF<br>(MGD) |
|------|--------------|--------------|
| 2010 | 27.313       | 43.700       |
| 2015 | 32.280       | 51.680       |
| 2020 | 36.355       | 58.168       |
| 2025 | 41.518       | 66.426       |
| 2030 | 45.698       | 73.116       |

#### **TOTAL WATER USAGE PROJECTIONS**

Water use projections for the utility service area must consider residential use, commercial/industrial/office use, unaccounted-for water, public use and the demand factors. For 2010, the projected daily flow for water utility use was approximately 0.160 mgd. Water Utility use refers to water that is used by the water and fire departments. It will be assumed that water utility use will stay constant at 1.46% of ADF throughout the 20-year planning period. **Table 4-6** is a summary of the water usage projections for the utility service area.

#### **DISCUSSION OF FUTURE LEVELS OF SERVICE - WATER**

Projected levels of service for the planning period are summarized in **Table 4-7**. The projected levels of service are from 177 in 2010 to 137 in 2030. The decreasing trend in level of service is a direct effect of the estimated impact of water conservation on water demands through the planning period. The levels of service listed in Table 4-7 were used in the preparation of the update to the water master plan. Therefore, the City's future water system has been designed, on a conceptual basis, to provide the projected levels of service found in **Table 4-7**. Accordingly, it appears that the targeted level of service for the utility service area would be 154 gpcd by 2020 and further reduced to 137 gpcd by the year 2030.

The minimum level of service adopted by the City of Apopka will have to be evaluated in the future. As the comprehensive plan is implemented by the City, the level of service will be reviewed and adjusted as necessary to stay current with the best available planning data.

**TABLE 4-7: SUMMARY OF PROJECTED LEVELS OF SERVICE\*,**

| <b>Year</b> | <b>(a)<br/>Total Estimated<br/>Population<br/>Served</b> | <b>(b)<br/>Projected<br/>Average<br/>Daily Flow (mgd)</b> | <b>(c)<br/>Projected Level<br/>of Service (gpcd)<br/>(b)10<sup>6</sup>- (a)</b> |
|-------------|--|---|---|
| 2010        | 59,196   | 10.505  | 177   |
| 2015        | 74,894   | 12.059  | 161   |
| 2020        | 90,633   | 14.002  | 154   |
| 2025        | 111,086  | 16.017  | 144   |
| 2030        | 129,304  | 17.659  | 137   |

SOURCE: Table 2A, June 2010 CUP Application

\*Does not include Zellwood station

**FUTURE POTABLE WATER FACILITIES**

**WATER TREATMENT PLANTS**

Based on the update to the water master plan, one additional water plant will be needed to serve the utility service area by 2030. The proposed southwest plant was identified to serve the southwest part of the utility service area. The projected capacities of the water plants (as described in **Table 4-3**) which will serve the utility service area through 2030 as listed below:

| <b>Water Plant</b>               | <b>2030<br/>Projected Capacity (mgd)</b> |
|----------------------------------|--|
| Jack G. Grossenbacher            | 23.616                                   |
| Sheeler Oaks                     | 9.576                                    |
| Myrtle Rogers Womble (Northwest) | 20.160                                   |
| Southwest                        | 25.200                                   |
| Plymouth Regional                | 16.704                                   |
| Mount Plymouth Lake              | 0.728                                    |

Source: Public Service Department, 2010

\* Based on Year 2035, per Master Plan data

The City of Apopka water treatment plants have maximum treatment capacity (well capacity) of 23,400 gpm or 33.7 mgd, which will potentially serve AADF demands beyond 2030. Additional capacity upgrades to transmission, distribution and storage facilities will be occurring during the next ten years.

The City plans to construct the Southwest Water Plant by the year 2016 consisting of one well, two high service pumps (HSP) and one

ground storage tank (GST). In 2021, the City will be adding one well and one HSP. The total Southwest WTP improvements for 2030 will be shown as two 3,500 gallon per minute (GPM) wells, three 3,500 GPM HSP's and two 1.5 million gallon (MG) GST's.

The City's 2030 storage capacity requirements have been estimated based on providing a total volume equal to four hours of fire flow (1,500 gpm \* 4 hrs = 0.36 mgal) plus operational storage for a total of 10.226 mgal. Operational storage is defined as the volume equal to the difference between the maximum day flow and the peak hour flow over an eight hour period [(89.972 mgd - 56.294 mgd) / 3 = 10.226 mgal]].

Based on the water flow projections, the following schedule for phasing the expansion of existing plants and construction of new plants appears to be appropriate, as shown in **Table 4-8**. As the City implements the comprehensive plan, the scope and scheduling of plant improvements should be adjusted as necessary to stay current with the best available planning date.

**TABLE 4-8: EXISTING WATER PLANTS PHASING PLAN**

| Water Plant                      | Existing Capacity (mgd) | Phase 1 Capacity (mgd) | Year Phase 1 Complete | Phase 2 Capacity (mgd) | Year Phase 2 Complete | Phase 3 Capacity (mgd) | Year Phase 3 Complete |
|----------------------------------|-------------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|
| Jack G. Grossenbacher            | 18.576                  | 0                      | 0                     | --                     | --                    | 5.040                  | 2030                  |
| Sheeler Oaks                     | 7.2                     | 0                      | 0                     | --                     | --                    | 0                      | 0                     |
| Myrtle Rogers Womble (Northwest) | 7.2                     | 4.320                  | 2010                  | --                     | --                    | 8.640                  | 2030                  |
| Southwest                        | 0                       | 0                      | 0                     | 8.64                   | 2015                  | 10.080                 | 2030                  |
| Plymouth Regional                | 6.336                   | 4.608                  | 2010                  | --                     | 2015                  | 5.760                  | 2030                  |
| Mount Plymouth Lake              | 5.155                   | 0.864                  | 2010                  | --                     | 2015                  | 3.744                  | 2030                  |

**Source:** Apopka Public Service Department, 2010

## **WATER DISTRIBUTION MAINS**

Based on the Update to the Water Master Plan, over 46 miles of water mains ranging in diameter from 6 inches to 36 inches will have to be constructed to serve the projected needs of the utility service area through the planning period. A list showing priorities of water main projects through 2030 was made to provide service to the areas where growth is expected to occur. As the City implements the comprehensive plan, the scope and scheduling of water distribution improvement will be adjusted as necessary to stay current with the best available planning data. There is currently no elevated storage serving the distribution system. Generally, pipes 12 inches in diameter and smaller are of polyvinyl chloride (PVC) construction whereas larger pipes are constructed from ductile iron. Improvements to the distribution/transmission system have generally followed the recommendations outlined in the most recent master plan, with the timing of specific projects dependent on development patterns.

## **SANITARY SEWER SUB-ELEMENT**

### **INTRODUCTION**

The purpose of the Sanitary Sewer Sub-Element is to provide for necessary sanitary sewer facilities and services correlated to future land use projections. The collection and disposal of wastewater is necessary for the protection of public health, safety and welfare. Congress enacted the Clean Water Act (CWA) in 1948, which established the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Congress significantly reorganized and expanded the act in 1972 and made more amendments in 1977. Under the CWA, the Environmental Protection Agency (EPA) has implemented pollution control programs such as setting wastewater standards for industry. The CWA has also set water quality standards for all contaminants in surface waters.

The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, without a permit. The EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. Point sources are discrete conveyances such as pipes or excavated ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not require an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

### **SANITARY SEWER EXISTING CONDITIONS**

#### **OPERATIONAL RESPONSIBILITY**

The City of Apopka owns, operates and maintains a public sanitary sewer system, including a wastewater treatment plant, called City of Apopka Water Reclamation Facility (WRF). The City's Public Services Department is responsible for the operations and maintenance of the central public sanitary sewer system

#### **SERVICE AREA AND PREDOMINANT USERS**

The utility service area for Apopka's sanitary sewer system is described in the Introduction to this element and shown in **Map 4-2**. The City provided 13,036 individual sanitary sewer connections in 2008 - 12,528 connections for domestic users and 508 for other users.

#### **WASTEWATER COLLECTION SYSTEM**

The City's wastewater collection system consists of gravity sewers, lift stations and force mains. The gravity sewers typically convey wastewater by gravity flow to lift stations. The lift stations contain pumps that pump the wastewater through pipes (i.e. force

mains) to other lift stations for repumping or directly to the treatment plant.

The key components of the City's existing collection system include the following:

1. The Errol Main Lift Station and 14-inch diameter force main. These facilities serve the entire Errol Estates development in the northwestern section of the utility service area.
2. The 24-inch diameter gravity sewer connecting the Errol force main to the Bradshaw Road Lift Station.
3. The Forest Avenue Lift Station. This lift station pumps about 30% of the wastewater currently being conveyed to the City of Apopka Water Reclamation Facility (WRF).
4. The 18-inch diameter force main connecting the Forest Avenue Lift Station to the WRF.
5. The 20-inch diameter force main along Cleveland Street and the Cleveland Street Regional lift station. This force main and regional lift station intercepts several force mains that transmit wastewater from the southeastern section of the utility service area.
6. The Bradshaw Road Lift Station pumps about 30% of the wastewater being conveyed to the City of Apopka WRF.

The Forest Avenue Lift Station is located at the site of the City's former wastewater treatment plant, which was replaced by the City of Apopka WRF located on Cleveland Street. The Forest Avenue Lift Station was installed to pump wastewater approximately two miles through an 18-inch diameter force main to the City of Apopka WRF.

Presently, there are 47 lift stations that pump into the 24-inch gravity sewer that feeds into the Bradshaw Road Lift Station. These lift stations range in capacity from the Bradshaw Road Lift Station, with a design capacity of 2,156 gallons per minute (gpm), to the Northwest Recreation Complex Lift Station, with a design capacity of 78 gpm.

There are 11 lift stations that connect to the 18-inch force main between the Forest Avenue Lift Station and the City of Apopka WRF. These lift stations range in design capacity from the 114 gpm Royal Oak Estates Lift Station to the 1500 gpm Cleveland Street Regional Lift Station. Other key force mains in the City's collection system include:

1. 12 inch force main from the Orange North Lift Station along Old Dixie Highway,
2. 12 inch force main along Sheeler Road between U.S. 441 and Cleveland Street,
3. 12 inch force main along Piedmont Wekiva Road, Old Apopka Road and Cleveland Street,
4. 12 inch force main along Park Avenue between Lake McCoy Drive

and Oak Street,

5. 12 inch force main along Binion Road, Orange Avenue and Apopka-Ocoee Road,
6. 14 inch force main along Vick Road from connection to Errol Main Lift Station to Lester Road and an 18 inch force main from Lester Road to Ponkan Road, and
7. 16 inch force main along Park Avenue from Lake McCoy Drive to just north of Welch Road.
8. The 20 inch force main along Bradshaw Road to Ocoee-Apopka Road, 13<sup>th</sup> Street, South Lake Avenue and Cleveland Street to the WRF.
9. The 12 inch force main along US 441 from Hones Ave. to Hermit Smith Rd. to General Electric Rd. to W. Orange Ave.
10. The 12 inch force main along Rock Springs Rd. from Kelly Park Rd. to Lift Stations No. 60.
11. The 12 inch force main from Zellwood Station along Yothers Rd. to Schopke Lester Rd.
12. The 12 inch force main on Ponkan Rd. from Ponkan Pines Rd. to Rock Springs Rd.
13. The 16 inch force main on W. Keene Rd. from Ocoee Apopka Rd. to Clarcona Rd. to the WRF.
14. The 12 inch force main along S. Binion Rd. from Ocoee Apopka Rd. to W. Orange Ave. to General Electric Rd.

The majority of the City's gravity collection system consists of 8-inch diameter pipe. This is the minimum size of gravity sewer allowed under Apopka's Land Development Code.

The service life for force mains and gravity sewers is variable and depends on pipe material, soil conditions, construction methods and other factors. Generally, the majority of the pipes that compose the City's wastewater collection system are expected to have a remaining useful life of 20 to 50 years.

#### **INFILTRATION AND INFLOW**

Infiltration/Inflow (I/I) refers to sources of water other than wastewater that enter the wastewater collection system and are not desirable since it consumes collection and treatment capacity. Infiltration is groundwater that enters a wastewater collection system through broken pipes, leaky pipe joints and leaky manholes. Infiltration generally does not become evident until the rainy

season when the groundwater table rises. Inflow refers to stormwater runoff that enters the wastewater collection system through leaky manhole covers and non-permitted stormwater connections. Inflow problems generally are indicated when treatment plant flow increases dramatically following a rainfall event.

Based on the data reviewed during preparation of the City's Wastewater Collection System Master Plan, it was estimated that I/I represents about ten percent or less of the flow recorded at the treatment plant. This percentage is not alarming when viewed on a system wide basis; however, isolated areas within the collection system may be the source of the majority of the I/I. The City identifies problem areas by closely monitoring lift station run times. Lift stations that operate for unusually long periods after rainfall events generally are suspected of receiving I/I. Sewer system evaluation measures such as smoke testing and televising are also undertaken in suspected collection systems to further document problem areas.

#### **WASTEWATER TREATMENT FACILITIES**

The City of Apopka's Water Reclamation Facility (WRF) and effluent spray field site is located southeast of the City limits near the intersection of Cleveland Street and Old Apopka Boulevard. The WRF was originally constructed and placed into operation in 1972, and at that time replaced an older City facility near Forest Avenue. The older facility along Forest Avenue has been taken out of service. The current City of Apopka WRF was originally permitted for a capacity of 2 million gallons per day (mgd).

The design of the new plant incorporated many of the same treatment processes that were included in the original plant that has been taken out of service. However, the new plant employs one additional process called sand filtration. The filtration process was needed so the plant could comply with the water quality standards assigned by the state to treated wastewater or reclaimed water that is used for irrigation on areas that are accessible to the public such as parks, lawns and golf courses. The new plant was designed to meet the following standards:

- secondary standards for BOD5 removal,
- removal of total suspended solids to a concentration of 5 mg/l or less, and
- high level disinfection.

The City's 1990 wastewater treatment plant expansion project included the construction of dewatering facilities for treatment of residuals (i.e. sludge) and increased the treatment capacity to 4.0

MGD. As the name implies, dewatering removes water from the residuals which reduces its volume and makes it easier to handle and transport. The City has negotiated an agreement with an independent hauler who will transport the residuals for disposal on an off-site location. The residuals are applied to agricultural land for use as a soil conditioner and fertilizer. Also completed as part of the plant expansion project, was a rehabilitation of the original plant.

The shallow groundwater beneath the land application site is monitored by the City in accordance with FDEP regulations. Generally, the quality of the groundwater flowing away from the land application site has been equal to or better than background water quality. The shallow groundwater table is confined in this area and therefore separated from the underlying Floridan aquifer. The Floridan aquifer is the chief supply of potable water in the Apopka area.

In June 2001 the City completed a construction project to expand the City of Apopka WRF. The construction project expanded the facility and increased the treatment capacity to 4.5 mgd. At this time, the design is ongoing to expand the capacity of the Apopka WRF to 8.0 mgd. The project construction should begin in 2010 and be completed by the end of 2011.

The expected service life for the reinforced concrete structures for the wastewater treatment plants is 30 to 50 years depending on the level of maintenance that is practiced. The expected service life for the mechanical equipment at the two plants is 15 to 30 years depending on the level of maintenance provided to the equipment. Some equipment items may have to be replaced more frequently as part of routine maintenance.

#### **RECLAIMED WATER SYSTEM**

The City's reclaimed water program is known as Project ARROW. ARROW is an acronym that stands for Apopka Regional Reuse of Water. The following facilities have been constructed by the City as part of Project ARROW.

##### **Apopka WRF**

1. - three prestressed concrete storage tanks with a total capacity of 4 million gallons,
2. - lined storage ponds with a capacity of 25 million gallons, and
3. - a reclaimed water pumping station with a total capacity of 10,800 gpm.

The City is currently providing reclaimed water for both commercial and residential consumption.

Commercial accounts include golf courses, nurseries, schools, landscape medians and City recreational facilities. Residential accounts currently include 11 subdivisions. Consumption for all the City reclaimed water customers averages 3.55 MGD.

The City has installed two upper Floridan aquifer wells to augment the reuse distribution system during periods of high demand. These wells are permitted through FDEP and SJRWMD. The SJRWMD has approved 1.5 mgd annual average withdrawal for these two wells. Currently, the City is completing the construction of a third augmentation well which should be operational in 2010.

The City of Apopka furnishes reclaimed water to a number of users through its Project ARROW (Apopka Regional Reuse of Water) distribution network. The Apopka Water Reclamation Facility (WRF) is currently the only source of reclaimed water for the City's system. The City has a reclaimed water pump station at the WRF and a re-pump station in the northern part of its service area. The North Pump Station is located adjacent to the Myrtle Rogers Womble WTP.

The Apopka WRF provides advance secondary treatment along with high level disinfection to produce reclaimed water that is suitable for use on public access areas like golf courses and home lawns. The Apopka WRF is permitted for a capacity of 4.5 million gallons per day (mgd). The City has received their Florida Department of Environmental Protection (FDEP) permit to expand the WRF to a capacity of 8.0 mgd. The WRF site has two wells that the City uses to supplement the supply of reclaimed water. The WRF has 4 million gallons (mg) of covered storage tank capacity and 25 mg of storage pond capacity. The construction of a third reuse augmentation well has recently received City Council approval.

The North Pump Station functions as a re-pump station for reclaimed water. During the day when demands for reclaimed water are low, the storage tank on the pump station site is filled by the reclaimed water transmission system from the WRF. During the early morning hours when irrigation demands increase, the North Pump Station pumps reclaimed water from the storage tank to the transmission system. The North Pump Station currently has a 2 mg ground storage tank (GST). The construction of a second 2 mg GSTs has recently received City Council approval.

The City has other storage facilities within its reclaimed water system. The Rock Springs Ridge Golf Course features a storage pond with 20 mg of holding capacity. In addition, the City recently completed construction of a storage pond with approximately 117 mg of capacity at its Northwest Recreation Center. This storage pond receives a combination of reclaimed water and stormwater runoff. **Table 4-9** summarizes the City's pumping and storage facilities.

**TABLE 4-9: SUMMARY OF FACILITIES EXISTING RECLAIMED WATER PUMPING AND STORAGE FACILITIES**

| Facility                            | High Service Pumps (gpm) | Total High Service Pumping Capacity (gpm) | Ground Storage (mg) | Pond Storage (mg) |
|-------------------------------------|--------------------------|---|---------------------|-------------------|
| Apopka WRF                          | 1,400                    | 10,800                                    | 1                   | 16                |
|                                     | 1,400                    |   | 1                   |                   |
|                                     | 1,400                    |   | 2                   |                   |
|                                     | 1,400                    |   |                     |                   |
|                                     | 2,600                    |   |                     |                   |
|                                     | 2,600                    |   |                     |                   |
| North Pump Station                  | 3,750                    | 7,500                                     | 2                   |                   |
|                                     | 3,750                    |   | 2 <sup>(1)</sup>    |                   |
| Rock Springs Ridge Golf Course      |                          |   |                     | 20                |
| NW Recreation Center <sup>(1)</sup> |                          |   |                     | 120               |
| Total System                        |                          | 18,300                                    | 6                   | 165               |

<sup>(1)</sup> This storage facility is currently under construction.

The current reclaimed water distribution system, not including on-site piping at the pump stations, consists of pipes ranging in diameter from 4-inch to 30-inches. Generally, pipes 12-inches in diameter and smaller are of polyvinyl chloride (PVC) construction whereas larger pipes are constructed from ductile iron. Improvements to the distribution/transmission system have generally followed the recommendations outlined in the most recent master plan, with the timing of specific projects dependent on development patterns. **Table 4-10** lists the various lengths of pipe in the system.

**TABLE 4-10: RECLAIMED WATER DISTRIBUTION/TRANSMISSION SYSTEM**

|                 | <b>Total</b>      |
|-----------------|-------------------|
| <b>Size, in</b> | <b>Length, ft</b> |
| 4               | 38,400            |
| 6               | 152,800           |
| 8               | 68,700            |
| 10              | 12,400            |
| 12              | 73,900            |
| 14              | 3,900             |
| 16              | 2,300             |
| 18              | 2,900             |
| 20              | 35,400            |
| 24              | 3,900             |
| 30              | 16,100            |

<sup>(1)</sup>Current through August 2006.

The proposed City of Apopka North Shore Reclaimed Water Pump Station is located in the southwestern section of the City's service area. Originally conceived as just a pump station, the City of Apopka is now engaged in a project to assess the feasibility of using water from the North Shore of Lake Apopka as a supplemental water source for the reclaimed water system (see below). The master planning of this pump station was included in the City of Apopka 2005 Reclaimed Water System Master Plan Update, dated August 2005 and prepared by Boyle Engineering Corporation. The North Shore Reclaimed Water Pump Station is proposed to eventually consist of the following:

- Surface Water Treatment System
- Two 3 million gallon pre-stressed concrete tanks
- One concrete block building to house electrical equipment (with air conditioning), chemical feed storage area and chemical feed pumps.
- Five VFD driven pumps each rated at approximately 4,500 gallons per minute (gpm) at full rated speed.
- Emergency generator system to power at least two pumps
- Plant site work
- Plant yard piping, electrical and controls systems

- Miscellaneous other improvements

Timing of individual aspects of this project will occur as needed over the next 20 years.

Large scale users of water will continue to play a major role in the City's reclaimed water system for many years to come. However, it is realized that the City's customer base could potentially change overnight due to a business failure or a catastrophic freeze. Project ARROW must be dynamic, flexible, creative and self perpetuating. These characteristics are evident as the City begins planning Project ARROW's future.

The City is committed to the development of dual water distribution systems so that reclaimed water can be beneficially used in residential areas. The term "dual water system" refers to water distribution that involves the use of two pipes or mains. One piping system distributes potable water and the second piping system distributes reclaimed water. The City Code requires developers to install dual water systems where reclaimed water is available. If reclaimed water is not available the City may choose to extend a pipeline to the developer's property. Future treatment plant expansions also will incorporate the necessary treatment technologies to produce reclaimed water that is acceptable for beneficial reuse.

The City's existing SJRWMD CUP permits the use of groundwater to augment the City's reclaimed water distribution system. The City is currently planning to pursue several projects to augment the City's reclaimed water supply, including surface water and the collection of stormwater into lined ponds. When these resources are available the City plans to divert the groundwater previously used for reclaimed water augmentation to satisfy the City's potable groundwater needs. It is projected that the Floridan aquifer will supply about 15.788 mgd in 2010, 17.771 mgd in 2013 and 14.542 mgd in 2020. These Floridan aquifer supplies will be used to satisfy the City's potable and reclaimed water system demands. As shown in **Table 4-11**, the reclaimed demand for the City is expected to increase over the next twenty years.

**TABLE 4-11: RECLAIMED WATER DEMAND**

| Year | Projected Service Population | Projected Average Daily Residential Demand (mgd) | Projected Average Daily Commercial & Other Demands (mgd)* | Projected Total Average Daily Reclaimed Water Demand (mgd) |
|------|------------------------------|--|---|--|
| 2010 | 15,532                       | 3.899  | 4.112   | 8.011  |
| 2013 | 22,596                       | 4.949  | 4.479   | 9.428  |
| 2015 | 27,305                       | 5.406  | 4.664   | 10.079   |
| 2020 | 39,580                       | 7.006  | 5.575   | 12.581   |
| 2025 | 57,170                       | 10.119   | 6.920   | 17.039   |
| 2030 | 73,568                       | 13.002   | 8.246   | 21.248   |

\*Includes common area landscape, commercial, water utility use, unaccounted water and Zellwood station.

#### **OPERATION AND MAINTENANCE**

Proper operation and maintenance are essential to providing a safe and reliable wastewater system. The City's wastewater collection, treatment and reclamation facilities are operated and maintained under the supervision of operators who are certified by the State of Florida.

The wastewater system relies on mechanical equipment such as pumps; therefore, it is critical that all lift station pumps, treatment equipment and other facilities be in good working condition. The City ensures that this equipment stays in good working condition through its preventative maintenance program.

#### **Use of Septic Tanks within the Utility Service Area**

Septic tank systems provide on-site wastewater treatment for both residential and small-scale commercial development. Septic tanks discharge to a drainfield, where the effluent percolates into the soil. Accordingly, soil permeability and the localized depth to the water table are the limiting factors on septic tank performance. There are approximately 2,932 septic systems in operation within the Apopka utility service area.

Rule 64E-6, F.A.C. states that drainfields shall not be installed in soils with textures finer than sand, loamy sand, or sandy loam (when the soil moisture content is above the point at which the soil changes from semi-solid to plastic) to prevent soil smear and excessive soil compaction. **Table 4-12** lists suitable soils and **Map 4-4** shows the distribution of the soils suitable for septic tank disposal systems in the utility service area. The suitability for

the use of septic tanks is determined by Orange County in accordance with Rule 10D-6, F.A.C., which contains the standards for on-site sewage disposal systems as developed by the Department of Health.

**TABLE 4 12: SOIL TEXTURE LIMITATIONS FOR SIZING OF DRAINFIELDS**

| U.S. Department of Agriculture<br>Soil Textural Classification  | Soil Texture Limitation<br>(Percolation Rate)  | Comments                                      |
|---|--|---|
| Sand; Coarse Sand not associated with a seasonal water table of less than 48 inches; and Loamy Coarse Sand  | Slightly Limited<br>(Less than 2 min/inch)   |   |
| Loamy Sand; Sandy Loam; Coarse Sandy Loam; Fine Sand  | Slightly Limited<br>(2-4 min/inch)   |   |
| Loam; Fine Sandy Loam; Silt Loam; Very Fine Sand; Very Fine Sandy Loam; Loamy Fine Sand; Loamy Very Fine Sand; Sandy clay loam                                | Moderately Limited<br>(5-10 min/inch)  |   |
| Clay Loam; Silty Clay Loam; Sandy Clay; Silty Clay, Silt  | Moderately limited<br>(Greater than 15 min/inch but not exceeding 30 min/inch)                       |   |
| Clay; Organic Soils; Hardpan; Bedrock   | Severely limited<br>(Greater than 30 min/inch)   | Unsatisfactory for standard subsurface system |
| Coarse Sand an estimated wet season high water table within 48 inches of the bottom of the proposed drainfield; Gravel or Fractured Rock or Oolitic Limestone | Severely limited with (Less than 1 min/inch and a water table less than 4 feet below the drainfield) | Unsatisfactory for standard subsurface system |

**Source:** Chapter 64E-6 FAC

The City has no authority to require areas within the county that are on septic tanks to connect to the sanitary sewer system. Rule 64-E, F.A.C requires that lot sizes be adequate and specifically does not permit use of septic tank systems if subdivisions are developed with a net density of two units per acre (1/2 acre lots) or greater.

The City currently has an estimated 134 private wells and 2,932 septic tank systems in use within the utility service area. Private wells and septic tank systems are not regulated by the City as they are reviewed by the Orange County Health Department.

Those areas shown in **Map 4-4** generally exhibit soil conditions that are compatible with septic tanks and existing septic tanks are predominantly located within these areas. Presently, there are no locations within the utility service area where septic tanks are

known to be failing. If septic tanks begin to fail within the unincorporated areas of the City's Utility Service Area, then the City and the county will develop a mutually acceptable plan to resolve the problem.

### **SANITARY SEWER FACILITIES NEEDS ANALYSIS**

The City has master planned sanitary sewer facilities to effectively manage growth. Each new development is required to provide the infrastructure needed to support its respective development as well as add the development's proportional share of upgrades to the system as described in the City's Wastewater Master Plan. Currently, the City is completing the planning and design to expand the capacity of the City's WRF to 8.0 mgd.

Currently, there are no private wastewater treatment facilities within the City limits of Apopka. However, there are four private wastewater treatment facilities within the City's utility service area boundary, but outside the City's limits. At present, the City has no plans to acquire and operate the private wastewater treatment facilities.

### **LEVEL OF SERVICE (LOS) STANDARD**

The level of service (LOS) standard adopted by the City in 1990 was 100 gallons per capita per day (gpcd). Based on historical records, the average daily demand per capita has decreased since 1990 due to improved maintenance of facilities and conservation practices. Existing data suggests that the City's appropriate level of service for sanitary sewer capacities is 90 gpcd. Therefore, the City will adopt a reduced LOS standard of 81 gpcd.

### **FUTURE WASTEWATER FACILITIES**

#### **OPERATION AND MAINTENANCE OF SANITARY SEWER FACILITIES**

The City's wastewater collection, treatment and reclamation facilities are operated and maintained under the supervision of operators who are certified by the State of Florida. The existing wastewater facilities currently exhibit no significant deficiencies. Minor deficiencies of the system include infiltration/inflow, which occurs when groundwater enters a wastewater collection system through broken pipes, leaky pipe joints and leaky manholes or because of stormwater runoff that enters the collection system through leaky manhole covers and illicit storm sewer connections to the wastewater collection system.

The City has its own video camera to perform video inspection of sewer lines. City crews perform line cleaning and video inspections on a daily basis. The City's lift stations are equipped

with SCADA and telemetry equipment which can notify City personnel in the event of a lift station failure. Eight of the City's pump stations are equipped with emergency standby generators. The remaining 99 existing pump stations are equipped with receptacles which permit the connection of a portable standby power generator. The City visits each pump station daily and frequently gives thorough mechanical and electrical inspection and preventive maintenance.

**FUTURE SANITARY SEWER FACILITIES NEEDS**

During preparation of the City's Wastewater Master Plan, the concept of expanding the existing wastewater treatment plant to serve the utility service area was developed. Expansion of the existing facility has several advantages as follows:

- eliminates the need for duplicate plant staff.
- does not require construction of duplicate facilities such as operations buildings, maintenance buildings and Motor Control Center (MCC) buildings.
- less expensive in capital and operations costs.
- land is readily available on-site to accommodate expansion; thereby, eliminating the legal and planning side of acquiring a new site for another treatment facility.

Based on population projections for the utility service area and utilizing the LOS standard of 90 gpcd, the City projects that the existing and planned sanitary sewer facilities will accommodate anticipated new development. **Table 4-13** provides a summary of the current and projected wastewater flows and the associated level of service.

**TABLE 4-13: PROJECTED WASTEWATER FLOWS**

| Wastewater System             | 2010   | 2020   | 2030    |
|-------------------------------|--------|--------|---------|
| Service Population            | 43,733 | 77,167 | 111,811 |
| Adopted LOS (gpcd)            | 90     | 90     | 90      |
| AADF (mgd)                    | 3.936  | 6.945  | 10.063  |
| Permitted WWTP Capacity (mgd) | 4.5    | 8.0    | 8.0     |
| <b>Surplus (Deficiency)</b>   | 0.564  | 1.055  | (2.063) |

**Source:** City of Apopka, 2009

It is estimated that the service population connected to the City sewer system will be 43,733 in 2010. It is expected that residences currently served by either Chalet North Mobile Home Park

wastewater treatment facilities, Rock Springs Mobile Home Park wastewater treatment facilities or septic tanks will continue to use those facilities through 2030.

Based on wastewater flow projections it appears that the City's next treatment plant expansion will be needed between 2020 and 2030. Design of the new facilities will have to be started in near year 2020.

It has been assumed that all future wastewater disposal capacity will be derived through beneficial reuse. However, there will continue to be a need for alternate disposal and reclaimed water storage facilities when weather conditions do not permit irrigation.

The scope and scheduling of plant improvements will be adjusted as necessary to stay current with the best available planning data.

# **STORMWATER MANAGEMENT SUB-ELEMENT**

## **INTRODUCTION**

The purpose of the Stormwater Management Sub-Element is to provide for necessary public facilities and services that will control the quantity and quality of stormwater runoff; preserve the quality of the surface waters that receive stormwater runoff; and protect lives and property from the threat of flooding.

Stormwater runoff is recognized as a major polluter of our nation's surface waters. This concern prompted Congress to include stormwater discharges under the National Pollution Discharge Elimination System (NPDES) contained in Section 402 of the Clean Water Act of 1987. The City of Apopka is required to obtain an NPDES permit for stormwater and complies with the NPDES requirements outlined in the permit.

Floodplain management is also important. When a lake, river or stream swells due to heavy rainfall, the floodplain accepts the augmented volume of water, where it is stored until it gradually discharges. Any attempt to fill in portions of the floodplain for development will ultimately reduce the capacity of the floodplain to store water, leading to an increased risk of flooding, increased erosion and possible property damage due to higher stream velocities. Wetland vegetation that may be indigenous to a flood plain is also important because it helps to naturally clean and treat stormwater runoff.

## **STORMWATER MANAGEMENT EXISTING CONDITIONS**

Stormwater management systems are typically comprised of a series of interconnected channels, conduits, inlets, culverts, bridges and storage facilities that convey runoff through a watershed area (basin) to its outfall. The appropriate management of stormwater involves:

- Treatment of stormwater runoff prior to discharge into surface waters;
- Stormwater discharge rate and volume attenuation to ensure that post-development runoff does not exceed pre-development runoff; and
- Where applicable, the design of stormwater management facilities shall promote recharge to the underlying aquifer system. The Aquifer Recharge Sub-Element more fully addresses these design issues.

## **DRAINAGE FEATURES AFFECTING THE CITY**

The natural surface water drainage system in the vicinity of Apopka generally consists of a large number of landlocked basins that may be either lakes or historically dry depressions, each with relatively small drainage areas. Normal rainfall events generate runoff that is directed to these depressions either by naturally occurring swales and conveyance channels, or through man-made conveyance systems constructed as part of the City's drainage system. For the most part, these depressions are not connected. During extreme rainfall events like those associated with tropical storms or hurricanes, there may be some inter-basin connections.

The City's downtown area sits on a broad ridge with elevations reaching 150 feet above mean sea level (MSL). The surrounding terrain generally slopes northeast toward the Wekiva River at elevation 25 feet above MSL and southwest to Lake Apopka at elevation 65 feet above MSL. As noted, very little flow occurs between the closed basins, and therefore little direct runoff reaches the Wekiva River system or Lake Apopka. One exception is the drainageway associated with Greenwood Cemetery. Runoff is directed to the ravine at this site, through a man-made conveyance system then surface flows are directed to the north under Votaw Road to Lake McCoy. Under tropical storm conditions this lake could discharge to a normally dry depression known as Lake Coroni; and possibly to Lake Prevatt, which is connected to the Wekiva River and is classified as an Outstanding Florida Waters.

## **REGULATORY FRAMEWORK**

The protection of surface water quality and the regulation of stormwater management is the responsibility of municipalities, counties and the state under the umbrella of federal law. Specifically to protect the quality of surface waters, the federal government enacted Section 208 of the Water Pollution Control Act for stormwater management. Additionally, Section 405 of the Federal Clean Water Act required that the Environmental Protection Agency (EPA) establish permit regulations for stormwater discharge, thus creating the National Pollutant Discharge Elimination System (NPDES) permit program. As of May 1, 2003, federal regulations required that all small construction activities disturbing one to five acres apply for an NPDES construction general permit.

The State of Florida addresses surface water management in Chapter 62-40 of the Florida Administrative Code (F.A.C.), defining state permitting requirements and stormwater management responsibilities. Section 62-40, F.A.C. states: "The Department (Environmental Protection) and the Districts (Water Management Districts),

pursuant to Section 373.418, F.S., shall, when adopting rules pertaining to stormwater management systems, specify design and performance criteria for new stormwater management systems which shall be designed to achieve an 80% reduction of the average annual load of pollutants that would cause or contribute to violations of state water quality standards." The code also states that stormwater management systems "shall be designed to achieve at least 95% reduction of the average annual load of pollutants that would cause or contribute to violations of state water quality standards in Outstanding Florida Waters."

Enforcement of stormwater management regulations within the City of Apopka falls under the SJRWMD, the Florida Department of Transportation (FDOT), Orange County and the City of Apopka. Depending on the location of a project, it is conceivable that permits could be required from three of the four agencies.

#### **St. Johns River Water Management District (SJRWMD)**

The SJRWMD operates under the rules of Chapter 40C-42, F.A.C., which govern stormwater management systems that are designed and constructed or implemented to control discharges necessitated by rainfall events. These systems may incorporate methods to collect, convey, store, absorb, inhibit, treat, use or reuse water to prevent or reduce flooding, over drainage, environmental degradation and pollution, or otherwise affect the quality and quantity of discharges. The SJRWMD has jurisdiction in regards to stormwater ponds, floodplain management and finished floor elevations within their district. In addition, if development projects have 4,000 square feet or more of impervious surface, the water management district requires an Environmental Resource Permit.

Requirements for Issuance of Permits. In order to obtain a standard general or individual environmental resource stormwater permit, an applicant must give reasonable assurance that the stormwater management system:

- Will not result in discharges from the system to surface and ground water of the state that cause or contribute to violations of state water quality standards.
- Will not adversely affect drainage and flood protection on adjacent or nearby properties not owned or controlled by the applicant,
- Will be capable of being effectively operated and maintained, and
- Meets any applicable surface water management basin criteria contained in Chapter 40C-41, F.A.C.

Peak Discharge (Stormwater Attenuation). The post-development peak discharge rate must not exceed predevelopment rates for the mean annual 24-hour storm for systems serving both of the following:

- New construction area greater than 50% impervious (excluding water bodies)
- Projects for the construction of new developments

The post-development peak rate of discharge must not exceed the predevelopment peak rate of discharge for the 25-year frequency storm in other areas.

Volume. For systems discharging to land-locked lakes adjacent to properties under more than one ownership the post-development volume of direct runoff shall not cause an increase in the total pre-development flood stage. This can be accomplished through retention with percolation or, if the soil conditions are not sufficient for percolation, then through wet or dry detention for a duration sufficient to mitigate adverse impacts on flood stages. In determining the volume of direct runoff, a 25 year, 96-hour duration storm is to be used.

Storage and Conveyance. Floodways and floodplains, and levels of flood flows or velocities of adjacent streams, impoundments or other watercourses must not be altered to adversely affect the off-site storage and conveyance capabilities of the water resource.

- A system may not cause a net reduction in flood storage within a 10-year floodplain except for structures elevated on pilings or traversing works. Traversing works, works or other structures shall cause no more than a one-foot increase in the 100 year flood elevation immediately upstream and no more than one tenth of a foot increase in the 100 year flood elevation 500 feet upstream. A system will not cause a net reduction in flood storage within a 10-year floodplain if compensating storage is provided outside the 10-year floodplain.
- A system may not cause a reduction in the flood conveyance capabilities provided by a floodway except for structure elevated on pilings or traversing works. Such works or other structures shall cause no more than a one foot increase in the 100 year flood elevation immediately upstream and no more than one tenth of a foot increase in the 100 year flood elevation 500 feet upstream.

Water Quality. State water quality standards must not be violated.

Hydrologic Basins. The City of Apopka lies within two hydrologic

basins - the Oklawaha River Hydrologic Basin and the Wekiva River Hydrologic Basin. The boundaries are shown in **Map 4-3**. In addition to the criteria described above, the SJRWMD requires that systems in specific hydrologic basins meet additional criteria.

- Oklawaha River Hydrologic Basin

Storm Frequency: The system shall meet applicable discharge criteria for 10 year and 25 year frequency storms. On-site storage and outlet capacity should be designed for the 25-year storm. Outlet capacity design should be checked and further refined, if necessary, for the 10-year storm.

Runoff Volume: For systems utilizing pumped discharges, the post-development discharge volume during the four-day period beginning the third day of the four-day duration storm may not exceed the pre-development discharge during the same period.

- Wekiva River Hydrologic Basin

Runoff Volume: Projects or portions of projects in the most effective recharge areas must retain three inches of runoff from the directly connected pervious area within the project area or applicants may demonstrate that the post-development recharge will be equal to or greater than the pre-development recharge. Those soils determined by the Soil Conservation Service (SCS) to be in the type "A" Hydrologic Soil Group (HSG) shall be considered to be most effective recharge areas.

Erosion and Sediment Control Plan: An erosion and sediment control plan must be submitted as part of the permit application for a project which is wholly or partially located within a water quality protection zone or serves a project with a total land area equal to or exceeding 120 acres. A water quality protection zone shall extend one half mile from the Wekiva River, Little Wekiva River north of State Road 436, Black Water Creek, Rock Springs Run, Seminole Creek and Sulphur Run, and shall also extend one quarter mile from any wetland abutting an Outstanding Florida Water.

### **Florida Department of Transportation (FDOT)**

FDOT has jurisdiction of stormwater management ponds and drainage conveyance facilities that are adjacent to or drain directly to FDOT road rights-of-way and drainage facilities. FDOT also constructs and maintains the necessary stormwater systems to control the quantity, quality and rate of drainage run-off generated by FDOT facilities. FDOT operates under an assumption that off-site (private property or other non-FDOT property)

stormwater runoff management has occurred prior to reaching the road right-of-way. However, when it is not feasible to maintain drainage from other properties separate from FDOT property and rights-of-way, FDOT promotes joint use and/or regional facilities to serve all affected parties.

Section 334.044, F.S., sets forth the powers and duties of the FDOT to develop and adopt uniform minimum standards and criteria for the design, construction, maintenance, and operation of public roads. This includes the ability of the FDOT to specify the design of open channels, to require minimum standards for the design of FDOT storm drain systems, and to develop standards and procedures for the hydraulic design of cross drains including culverts, bridge-culverts and bridges.

### **Orange County**

Orange County has jurisdiction over the connection of any stormwater facility or structure to county-owned stormwater conveyance, retention and wet or dry detention facilities. As such, new development or redevelopment that requires new driveways onto county roads or impacts county roads and stormwater systems must obtain county approval.

### **City of Apopka**

All new development or redevelopment projects within the City limits must obtain stormwater management approval from the City. The City is also responsible for maintaining its stormwater management structures and facilities. The City of Apopka's Land Development Code regulates stormwater management as follows:

- The post-development peak rate of discharge must not exceed the pre-development peak rate of discharge for the 25-year, 24-hour storm (8.6 inches).
- Pollution abatement will be accomplished by retention or detention with filtration of one-half inch of runoff from the developed site.
- When the project discharges to land-locked lakes that have no positive outfall, on-site stormwater facilities shall be designed to detain the 25-year, 96-hour design storm (12.0 inches).
- Storm sewer system design is to be based upon a 10-year frequency event.
- The minimum size of pipe to be used in a storm sewer system is 15 inches in diameter.

### **OPERATION AND MAINTENANCE OF STORMWATER FACILITIES**

The City maintains drainage ditches, storm sewer pipes, catch basins and other similar facilities. Generally, the City does not accept the responsibility to maintain retention ponds, which is the responsibility of the property owner or a homeowners association. Without proper maintenance, retention ponds can potentially become ineffective as well as eyesores. While many privately owned facilities receive the proper amount of maintenance, there are some which do not get adequately maintained. When private retention ponds are not well maintained, the City must provide maintenance due to complaints from citizens.

## **STORMWATER MANAGEMENT FACILITIES NEEDS ANALYSIS**

### **GENERAL**

The City's drainage master plan was updated in April 2009. Stormwater management is a regional issue that transcends political boundaries. The study area for the drainage master plan included the City's utility service area. Analysis conducted outside the City limits was primarily focused on future regionalization of stormwater management facilities. Specific infrastructure improvements have not been recommended for stormwater management outside the City limits.

Located within the corporate limits of the City of Apopka, there are drainage facilities that serve county, state, and federal roadways. Generally, these facilities have been designed to handle the stormwater runoff generated by the immediate drainage basin in which the road is located. It is the policy of the agencies that are responsible for these roads, that connections to their drainage facilities shall not adversely affect capacity. Therefore, best management practices must be employed to mitigate potential adverse impacts.

### **DRAINAGE BASINS**

The City is divided into 15 major drainage basins. The major drainage basins were then further sub-divided into 130 sub-basins.

Drainage divides between major basins and sub-basins were determined from USGS topographic maps. The drainage basins are shown in **Map 4-4**. Of the 130 sub-basins that were analyzed, it was determined that 61 of the sub-basins have positive outfalls and the remaining 69 sub-basins are landlocked.

### **OPERATIONAL IMPROVEMENTS TO DRAINAGE SYSTEMS**

Several improvements which were addressed in the previous drainage master plan have been completed. These improvements

included the Railroad Drainage Basin Project and the Lake Avenue Drainage Well Project. The recently updated drainage master plan has identified one problem area which needs to be addressed by the City. This present problem area includes the Lake Avenue/Main Street Drainage Basin Project. Flooding occurs in the vicinity of Lake Avenue and Main Street during heavy rains. Recommended improvements for correcting this flooding problem include installation of two manholes, two junction boxes, and approximately 1,800 feet of 30-inch drainage pipe.

#### **STORMWATER UTILITY**

The City Council adopted a stormwater utility in 1992. The revenues are used to fund drainage capital improvements and other programs relating to stormwater.

#### **REGIONAL STORMWATER MANAGEMENT FACILITIES**

At the present time, most of the commercial and residential projects developed in the City involved the construction, operation and maintenance of a stormwater management facility by a single entity or owner. Regionalization of stormwater management involves facilities which are designed to serve multiple projects within a specific drainage basin. Regionalization of stormwater provides a more uniform approach to resource management within a drainage basin.

Regionalization of stormwater facilities provides several positive aspects as listed below:

- more effective and standardized operation and maintenance of (O&M) stormwater facilities that are under the control of one entity, rather than scattered small facilities operated by private entities who may not be experienced in stormwater management,
- reduced maintenance costs at centralized facilities due to fewer number of facilities, reduced personnel travel time, and possible use of larger, more efficient maintenance equipment,
- master planning of an entire basin for stormwater conveyance facilities rather than piecing small systems together,
- improved water quality with the potential for treatment of runoff from developed areas not previously treated,
- more efficient use of individual land parcels,
- regional facilities could be designed to create opportunities for additional uses such as parks, preservation of unique habitat or

other recreational/green space uses, and

- positive impact on permitting and coordination with St. Johns River Water Management District, through master planning of each basin and the District working with one entity.

For largely undeveloped areas, the regional facilities could be constructed and then the developers charged for their share of the capital costs as they connect to the system. The main disadvantage with this arrangement is that the City would have to carry the financial burden until the area develops. The possibility may exist for a regional system to be phased, but this would take close coordination with the regulatory agencies. Capacity would have to be available prior to a new development being constructed. Other options include:

- The first large-scale developer in a basin would build the entire regional facility. The City would then collect funds from subsequent development projects to reimburse the original developer's over sizing costs.

- Developers would pay their fair share for capacity in a regional facility. Until it is completely financed and constructed, the developers would construct temporary facilities at their individual sites. Upon completion of the regional facility, they would tie in to it and convert the temporary facility to some other beneficial use.

# NATURAL GROUNDWATER AQUIFER RECHARGE SUBELEMENT

## INTRODUCTION

### PURPOSE AND SCOPE

Florida Statutes require local government comprehensive plans in Florida to consider the protection of natural aquifer recharge areas. This is critical because most jurisdictions in Florida rely on aquifers as the sole source of drinking water. This element provides a description of the measures the City of Apopka takes to address this issue.

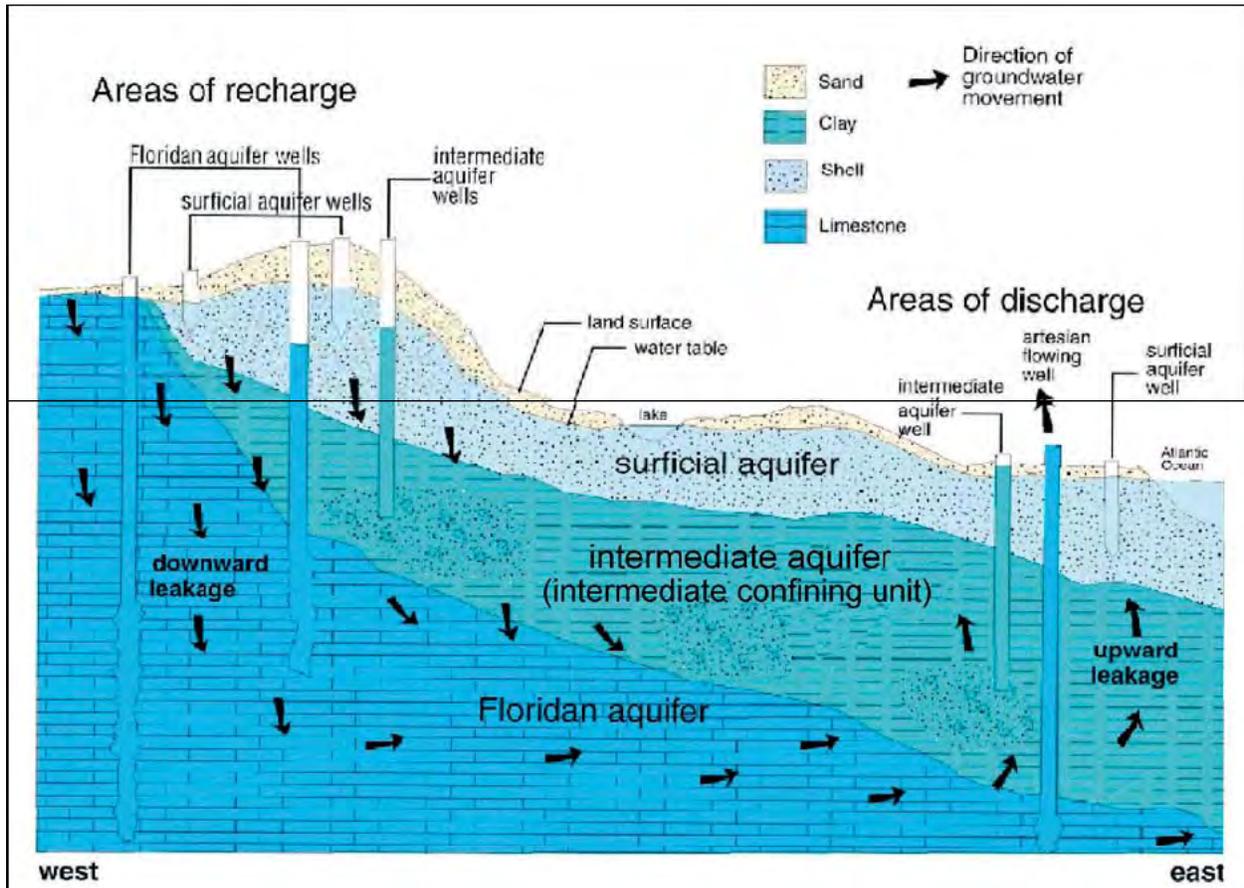
### THE FLORIDAN AQUIFER

An aquifer is a subsurface zone that contains and allows fresh water to move from one area to another. These aquifers contain very large quantities of freshwater capable of yielding billions of gallons per day. If this resource is not properly managed, then the supply can be exhausted; or more likely, contaminated. Protection and preservation of these aquifers are important to ensure the supply of potable water is available to future populations.

Recharge is simply the process of replenishing the aquifer. Recharge can occur naturally through percolation. The source of water in aquifers is rainfall. Under the force of gravity, rainfall percolates downward through porous surface soils to enter the aquifer strata. Because of the variable permeability of different soil types, the rate of aquifer recharge from rainfall may vary from one location to another.

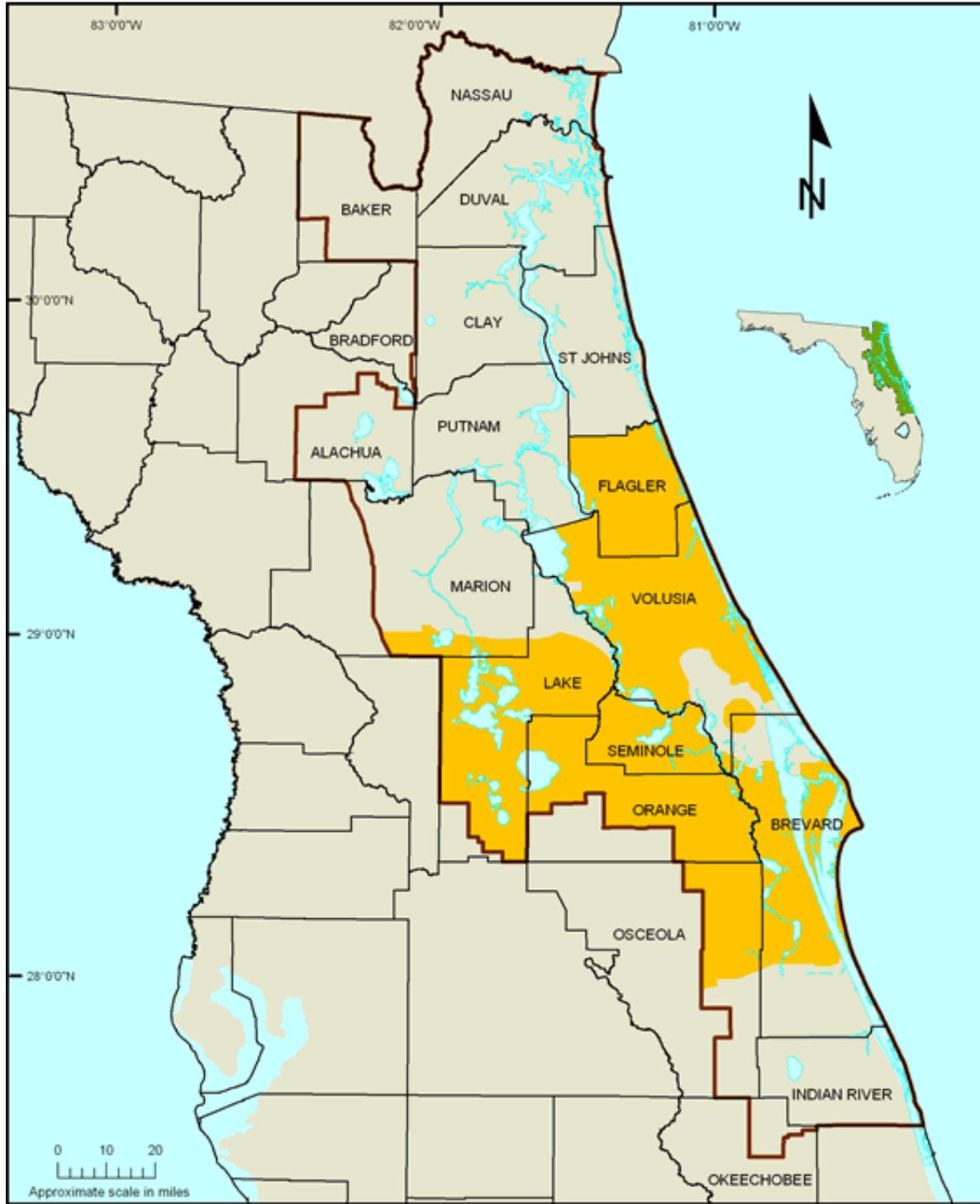
The Floridan aquifer is the primary source of potable water for Apopka. **Figure 4-1** depicts the general structure of the hydrogeological formation of the Floridan aquifer. Principally, the water in the aquifer is derived from rainfall which averages 48.88 inches annually. This aquifer can be up to 2,000 feet thick in some areas and occurs 100 to 200 feet below the land surface. A secondary surficial aquifer is also present and may be found at depths of 60 to 150 feet below the land surface. The primary function of this aquifer is to store water before its infiltration into the Floridan aquifer.

**FIGURE 4 - 2: FLORIDAN AQUIFER SYSTEMS**

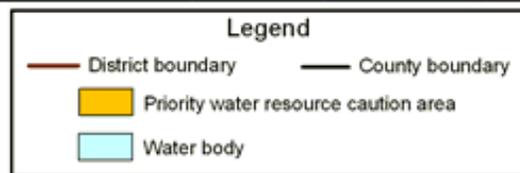


In most of Orange County the Hawthorn Formation restrains the movement of water from the surficial aquifer to the underlying Floridan aquifer. This confining bed is thinnest in the northwest area of the County placing the City of Apopka in an area of high aquifer recharge. **Figure 4-2** shows the St. Johns River Water Management District (SJRWMD) Priority Water Resource Caution Areas and **Figure 4-3** shows the location of high aquifer recharge areas in Apopka.

FIGURE 4- 1: SJRWMD PRIORITY WATER RESOURCE CAUTION AREAS



Priority water resource caution areas in the St. Johns River Water Management District, 2005



## **AQUIFER RECHARGE ANALYSIS**

Aquifer recharge areas are subject to alteration by development. Covering a recharge area with impervious surfaces, such as roads, parking lots and buildings reduces the area available for rainfall percolation, altering the total rate and volume of recharge in that area. Increasing the rate at which stormwater drains from recharge surface area also decreases recharge potential.

A second concern related to development within aquifer recharge areas is the potential for contamination of groundwater within the aquifer. Just as with stormwater run-off to surface waters, pollutants picked up by run-off which enters an aquifer can degrade the quality of the groundwater. Since water flows within an aquifer in a manner similar to surface water flow, downstream portions of the ground water may be polluted over time. This becomes particularly significant when the aquifer is tapped as a potable water supply downstream.

### **GROUNDWATER SOURCE PROTECTION**

Groundwater recharge is vital for providing adequate groundwater supplies for future uses and for preserving the quality of groundwater resources. The City's central water system, which depends on the quality and quantity of available groundwater, is comprised of public production water wells as noted in the Potable Water Element. The City coordinates the production quality of these wells and the consumption of water with the SJRWMD. The SJRWMD performs the required well suitability assessments, permits production wells and requires significant environmental documentation as to the soils, ecology and impacts of the wells, as well as conducting annual inspections.

### **GROUNDWATER RECHARGE IMPACT**

Stormwater is the primary recharge resource for the Floridan Aquifer. Development can increase the amount of impervious surfaces and alter the natural topography, vegetation and runoff patterns, in turn reducing the quantity of natural recharge. Limiting the percentage of impervious surfaces in high recharge areas and encouraging preservation of natural recharge areas in land development regulations aid in maintaining the recharge levels. Currently, land use within the majority of the high recharge areas in Apopka consists of predominantly low density residential.

The SJRWMD completed an aquifer protection plan in 2005 that identified areas in which groundwater supplies were at a risk of depletion and recommended strategies to protect the aquifer. The strategies include artificial recharge projects, technical

assistance and regulatory program enhancements.

### **AQUIFER CONTAMINATION**

High recharge areas may experience groundwater contamination from both point source and non-point source pollutants such as those contained in stormwater runoff. Although the Floridan Aquifer is massive in size, prevention of contamination in high recharge areas is essential due to the regional use of the groundwater supply. The City has adopted stormwater management and wellhead protection regulations that protect the aquifer from contamination

### **REGULATORY FRAMEWORK**

Governing bodies have enacted regulations to prevent negative impacts of excessive water consumption. Extreme lowering of aquifer levels and surface water flows can adversely affect ecosystems by lowering lake levels, degrading wetlands and other natural systems and habitats.

#### **Water Management District Regulations**

The state delegates powers to water management districts to regulate well construction and ensure that wells are contaminant free.

#### **State Regulations**

The State of Florida adopted wellhead protection rules in Rule 62-521, F.A.C. The rule defines a "Wellhead Protection Area" as an "area designated by the Department consisting of a 500 foot radial setback distance around a potable water well where ground water is provided the most stringent protection measures to protect the ground water source for a potable water well and includes the surface and subsurface area surrounding the well." Chapter 62-521, F.A.C. additionally defines ground water protection measures in Wellhead Protection Areas. Such measures include rules governing:

- New domestic wastewater treatment facilities
- New domestic wastewater residuals land application sites
- New discharges to ground water
- New solid waste disposal facilities
- New generators of hazardous waste
- New hazardous waste treatment, storage, disposal and transfer facilities
- New above ground and underground tankage of hazardous wastes

### **Local Regulations**

As a means to address these concerns the City has adopted criteria that regulates stormwater run-off rates and volume. In addition the City has adopted an ordinance stipulating that all existing drainwells within the City be plugged. Development regulations related to drainage and stormwater management are further explained in the Conservation Element and the Drainage Sub-element.

The City shall continue to support the SJRWMD in the implementation of Chapters 40C-4, 40C-40, 40C-41 and 40C-42, F.A.C. including the Wekiva River Hydrologic Basin criteria.

**SOLID WASTE SUB-ELEMENT**

**EXISTING CONDITIONS**

Orange County is the primary entity responsible for providing solid waste disposal facilities for Apopka and the rest of the county. The City provides solid waste collection services for residential households and commercial users within its entire corporate limits. No services are provided to adjacent jurisdictions or to the unincorporated county area.

**COLLECTION SYSTEM**

The City's Sanitation Division is responsible for the collection and delivery of both residential and non-residential solid waste to the county transfer stations or landfill and for monitoring solid waste activity. As of September 30, 2008, the City has 507 commercial customers (including multi-family residential) and 8,051 residential customers.

**LEVEL OF SERVICE**

The City adopted level of service (LOS) standards of four pounds per capita per day for residential waste and 2 pounds per 1,000 square feet of commercial development. Commercial pick-ups are based on the needs of the individual accounts and are available from one to seven days per week. Residential customers receive curbside collection, twice per week.

|                        |                         |
|------------------------|-------------------------|
| As of September 2009:  | Tons Per Day (365 days) |
|                        | Actual                  |
| Commercial             | 24.98                   |
| Residential households | 39.18                   |
| Recycling              | 5.79                    |
| TOTALS                 | 69.95                   |

**RECYCLING**

The City of Apopka offers curbside collection of mixed-materials (i.e., newspaper, cardboard, glass, cans, and plastics). On January 1, 1992, state law mandated that all yard waste be removed from Class 1 household garbage and the City established new schedules to comply with this law. On January 2, 1996, the City joined Orange County with the mandatory Commercial Recycling Program for all businesses and multi-family developments.

## **HAZARDOUS WASTES**

The City of Apopka does not collect or dispose of any hazardous wastes; however, it is conceivable that some small amounts of household hazardous waste is disposed of in the landfill due to homeowners mixing household hazardous wastes such as pesticide cans, waste oil and paint cans in with their household refuse. The Florida Department of Environmental Protection (FDEP) and Orange County's Environmental Protection Department (OCEPD) are responsible for any hazardous wastes found or collected within the City limits including small quantity generators, households, farms and businesses.

## **SOLID WASTE FACILITIES**

There are no solid waste disposal locations within the City of Apopka. Solid waste material collected by franchised haulers is delivered to Orange County's Transfer Stations or to the landfill. Recycling material is delivered to the Orange County Landfill.

## **FUTURE CONDITIONS ANALYSIS**

### **LEVEL OF SERVICE AND FINANCIAL FEASIBILITY**

The City of Apopka does not anticipate any revision to the current solid waste collection and disposal program. The City's solid waste activities are supported by an enterprise fund. Service charges are evaluated annually or at the time of landfill charges (tipping fees) are increased to ensure sufficient revenue is generated to fund all required operations, maintenance and capital costs.

### **RECYCLING**

The City of Apopka will continue offering residential recycling of newspapers and mixed recyclables. The City will continue to cooperate with Orange County to increase the recycling effort for commercial material. The City of Apopka will coordinate with Orange County and other local municipalities to pursue new technologies for collecting and processing recyclable materials.

## **HAZARDOUS WASTES**

The City of Apopka shall continue to assist the FDEP and OCEPD in eliminating improper household hazardous waste disposal by continuing to assist OCEPD in their Household Hazardous Waste Round-Up programs throughout the county and by distributing FDEP provided educational information. The City shall also publish

information regarding hazardous waste recycling and other disposal programs.

**SOLID WASTE FACILITIES**

The City of Apopka will continue to rely on Orange County for the disposal of solid waste materials in accordance with Chapter 403.706, Florida Statutes (F.S.). There is currently no formal agreement establishing any specific proportional capacity to the City. **Table 4-13** illustrates the City's projected solid waste disposal needs (Note: The City and county's population projections are very similar, so no change in the City's percentage of the county landfill is expected):

**TABLE 4-14: PROJECTED SOLID WASTE DISPOSAL NEEDS**

| Year  | Projected Population <sup>1</sup> | Projected City Tonnage <sup>2</sup> | Percent of County Landfill | Projected Recycle Tonnage <sup>3</sup> | Percent of County Landfill |
|-------|-----------------------------------|-------------------------------------|----------------------------|--|----------------------------|
| 2009* | 40,971                            | 23,422                              | 3.2%                       | 2,155                                  | 2.4%                       |
| 2010  | 41,983                            | 24,001                              |                            | 2,208                                  |                            |
| 2015  | 56,953                            | 32,558                              |                            | 2,996                                  |                            |
| 2020  | 74,289                            | 42,469                              |                            | 3,907                                  |                            |
| 2025  | 98,743                            | 56,448                              |                            | 5,194                                  |                            |
| 2030  | 125,538                           | 71,766                              |                            | 6,603                                  |                            |

*Note: The service area for solid waste collection is the City's municipal boundaries.*

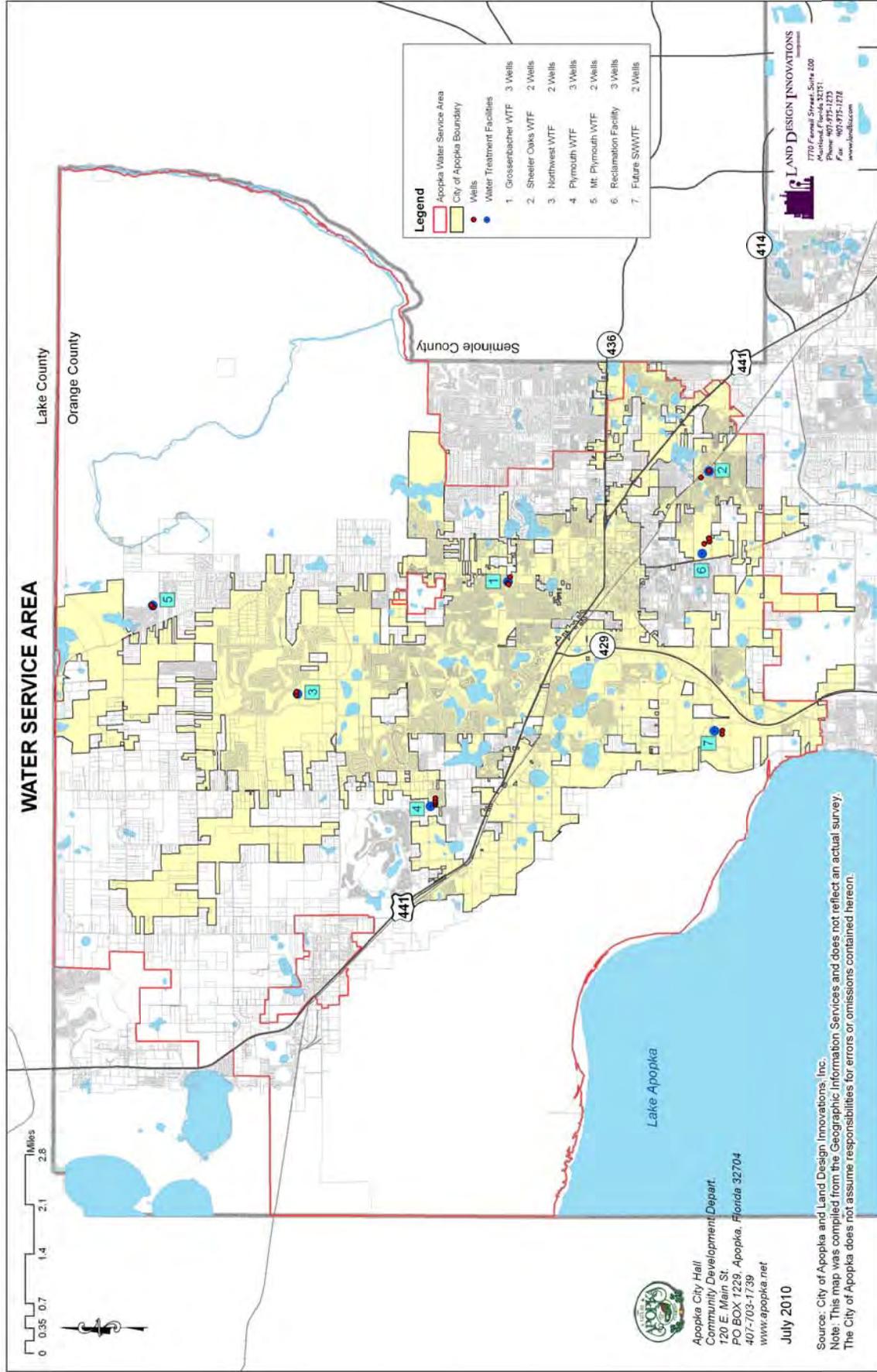
- (1) Includes seasonal population
- (2) Tonnage deposited in the Orange County Class I Landfill (includes residential and commercial waste from regularly scheduled can and dumpster pickup - no white goods, yard waste or hazardous waste)
- (3) Tonnage deposited at the Orange County Landfill and distributed to either the recycling separation facility, the white goods facility or the landscape waste facility

\* Tonnage based on actual figures for October 1, 2008 to September 30, 2009.

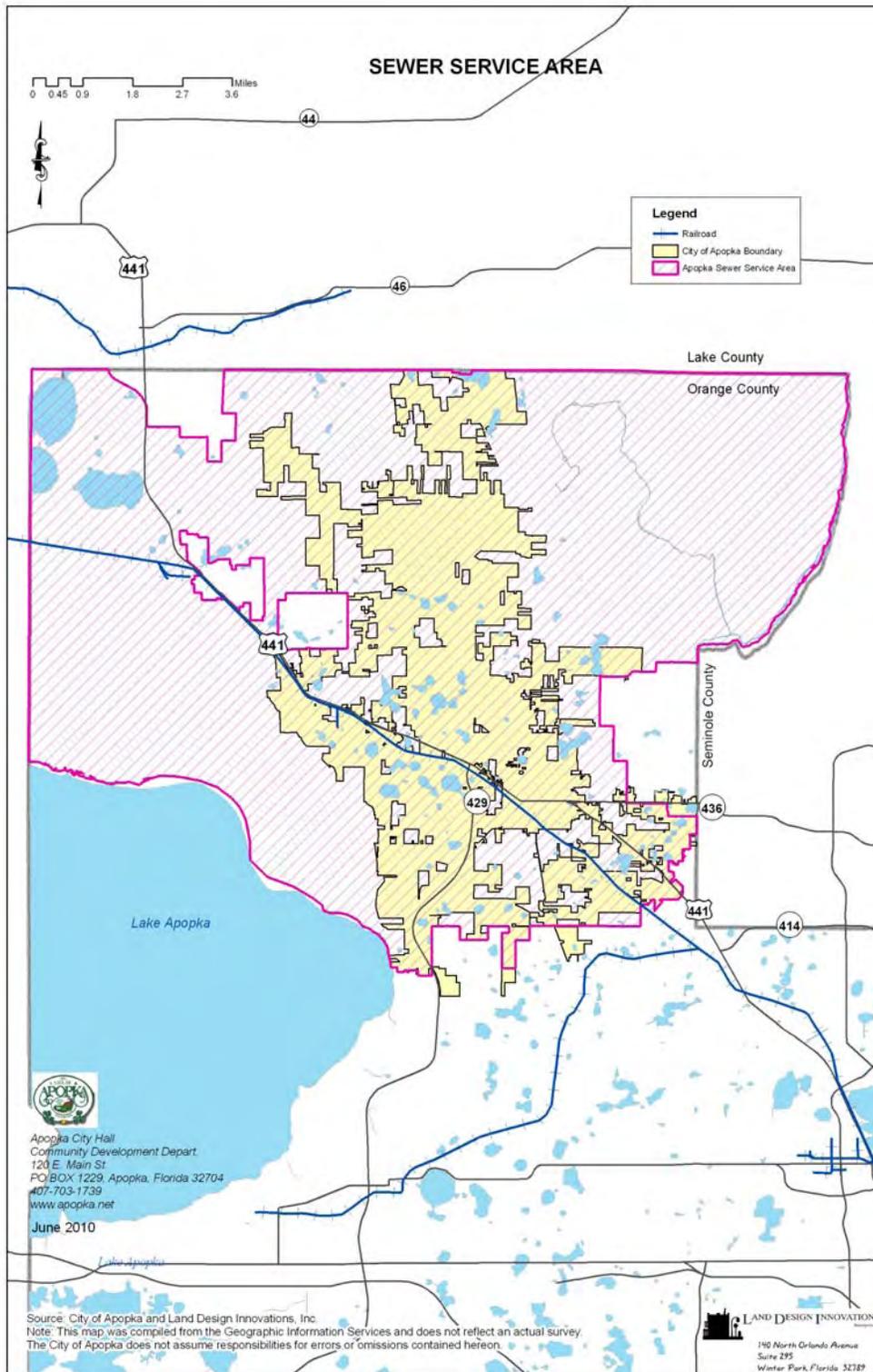
**Source:** City of Apopka, 2009

According to county projections, the Orange County Landfill is capable of meeting the solid waste disposal demands for Apopka at its adopted LOS standard through the 2030 planning horizon. Timing and location of recycling facilities are determined by Orange County and the City of Apopka.

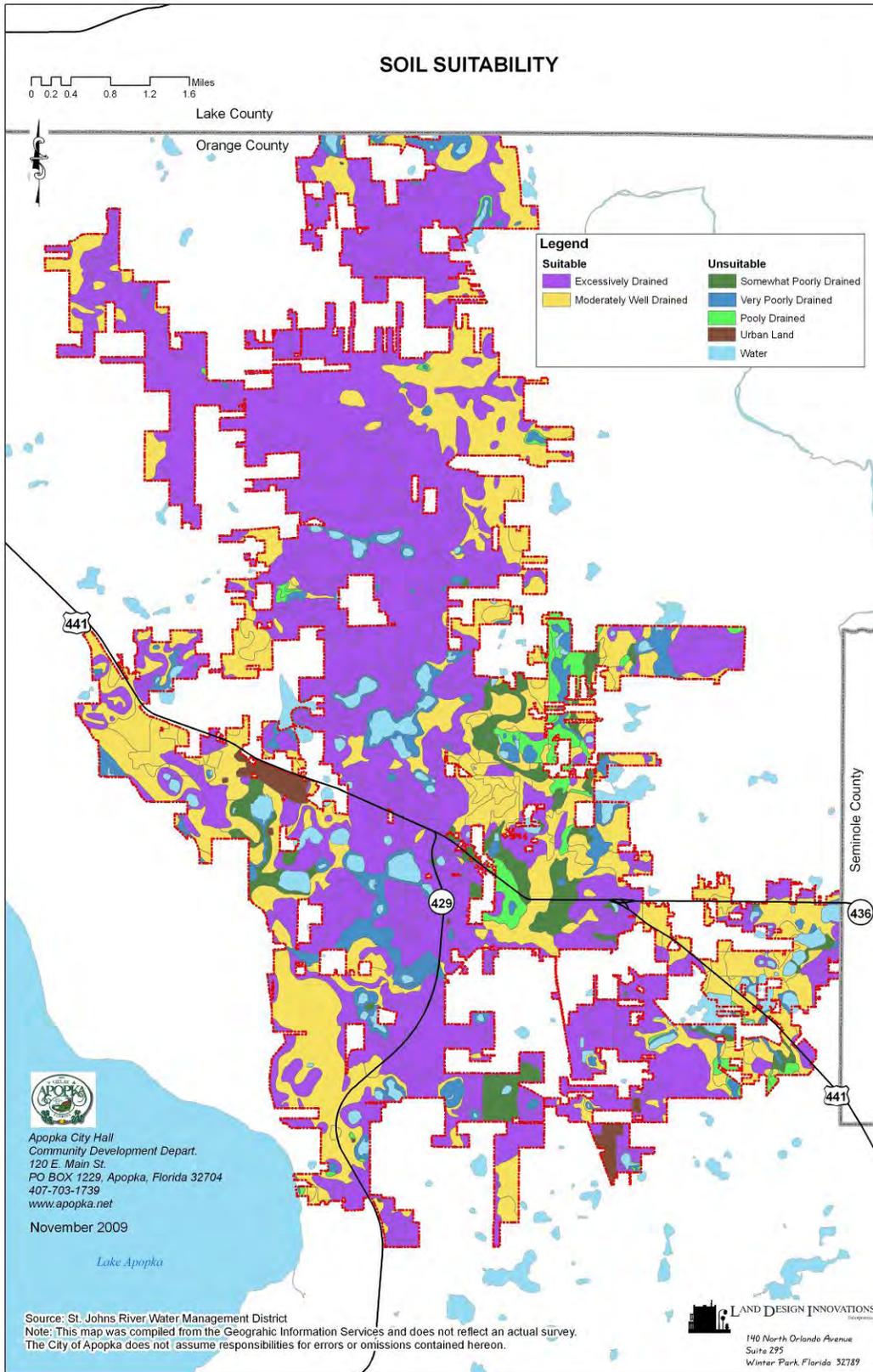
MAP 4-1: APOPKA WATER SERVICE AREA



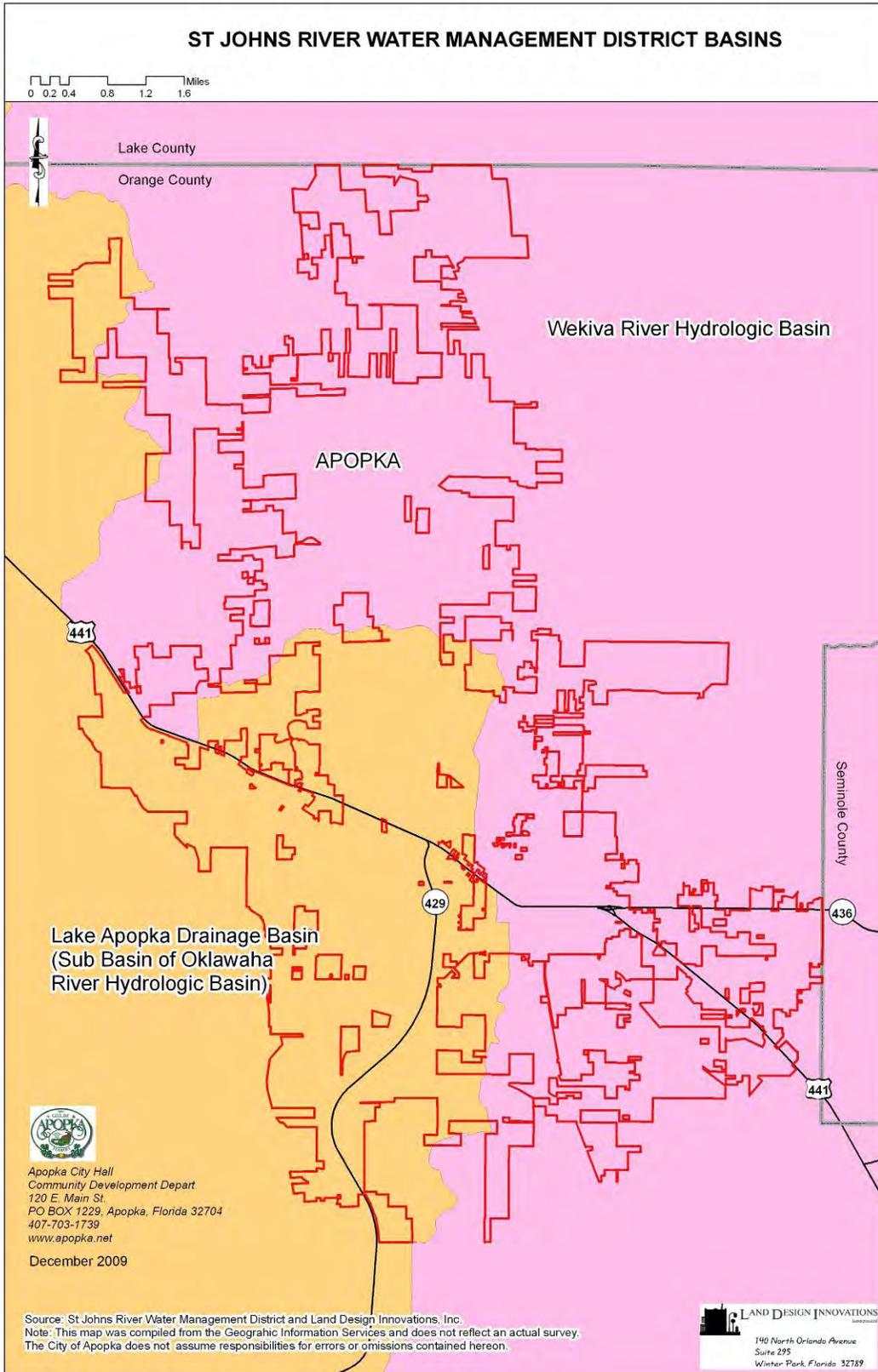
**MAP 4-2: APOPKA SEWER SERVICE AREA**



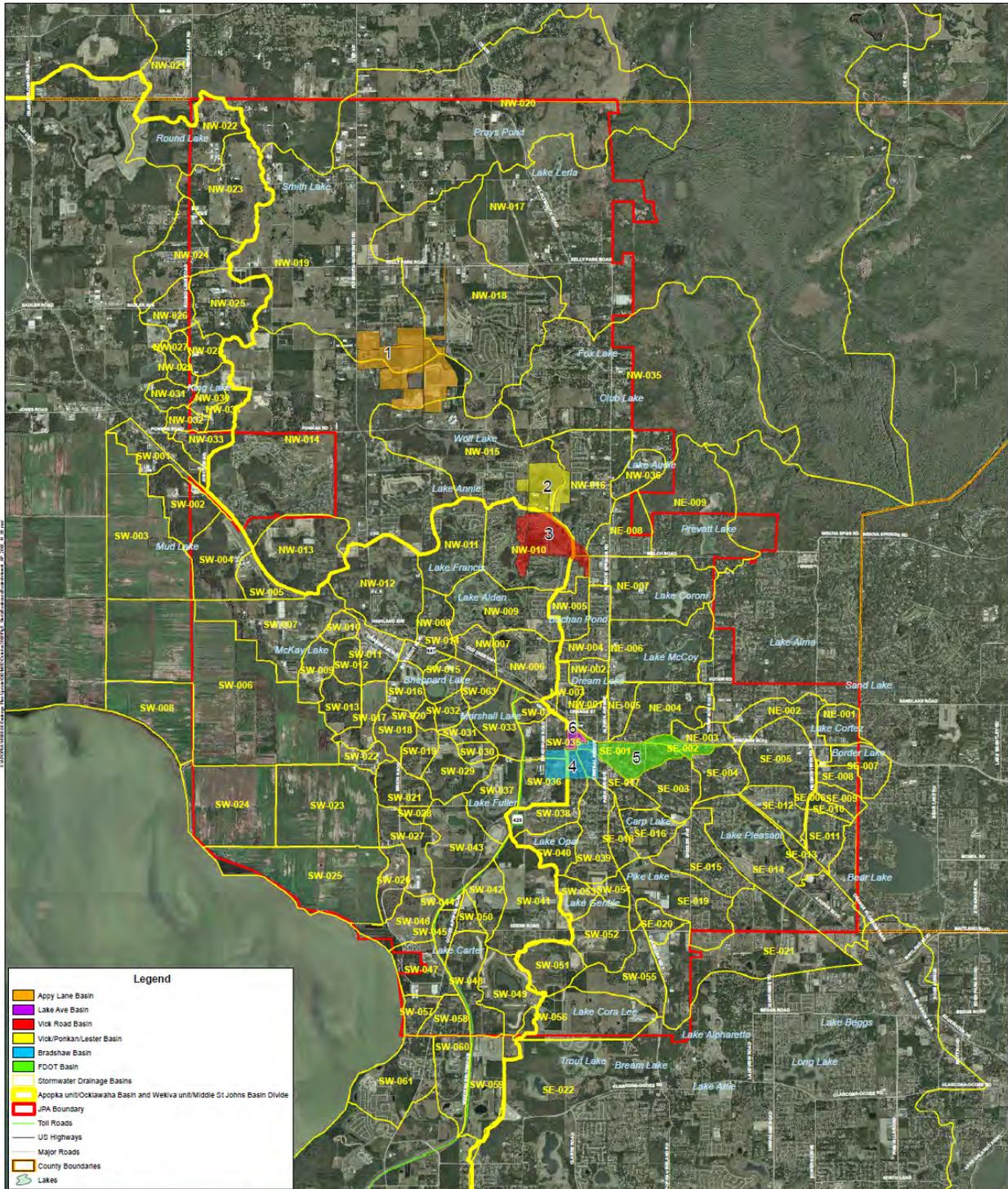
**MAP 4-3: SOIL SUITABILITY**



**MAP 4-4: ST. JOHNS RIVER WATER MANAGEMENT DISTRICT BASINS**



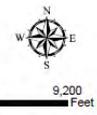
**MAP 4-5: DRAINAGE BASIN BOUNDARIES**



**Legend**

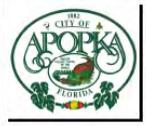
- Appy Lane Basin
- Lake Ave Basin
- Vick Road Basin
- Vick/Ponkan/Lester Basin
- Bradshaw Basin
- FDOT Basin
- Stormwater Drainage Basins
- Apopka units/Ocklawaha Basin and Wekiva unit/Middle St. Johns Basin Divide
- JPA Boundary
- Toll Roads
- US Highways
- Major Roads
- County Boundaries
- Lakes

Source: Aerial (ESRI, 2006); Roads (POD);  
 Sub-basins (Lake Apopka Basin Stormwater  
 Management Master Plan, July 2007);  
 User: cmr  
 Date: April 2009  
 County: Orange  
 Projection: NAD 83 FL EAST (FT)



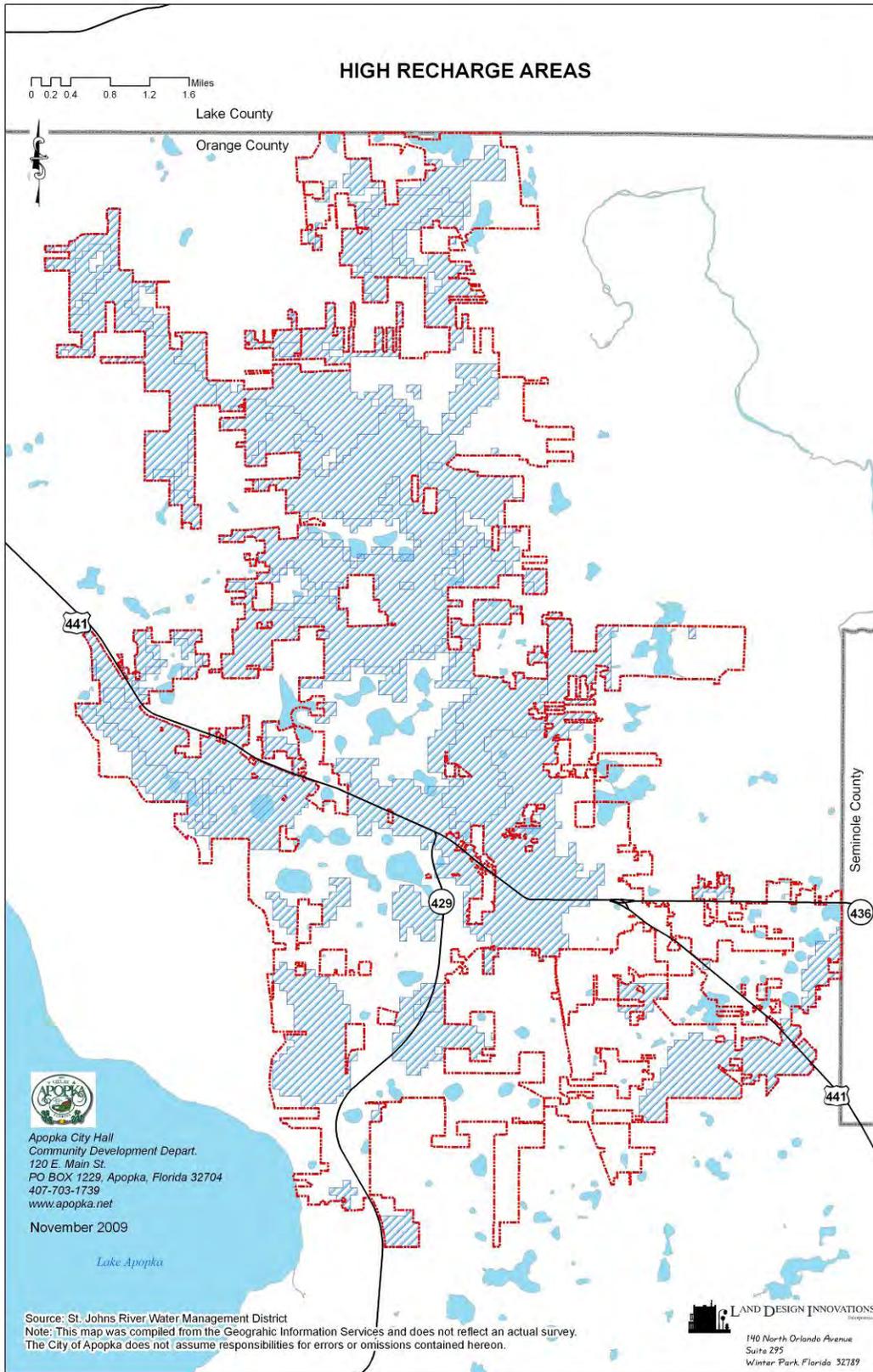
**AECOM**  
 330 East South Street  
 Orlando, FL 32801  
 FL ENGINEERING BUS. NO. 2005  
 407-428-1100

**City of Apopka**  
**Master Drainage Plan Update**  
**Study Area Drainage Basins**  
**and Basins of Interest**



Project Number  
 16999.00

MAP 4-6: HIGH AQUIFER RECHARGE AREAS IN APOPKA



## **INFRASTRUCTURE ELEMENT**

### **GOALS, OBJECTIVES AND POLICIES**

#### **SANITARY SEWER SUB-ELEMENT**

##### **GOAL 1**

To provide for the collection, treatment and reclamation of wastewater in an environmentally safe and cost effective manner that will be sufficient to meet the existing and future needs of the citizens residing in the utility service area.

##### **Objective 1.1**

The City of Apopka's existing and future wastewater collection and treatment system shall provide the following minimum levels of service, through treatment, conservation and public education strategies.

###### **Policy 1.1.1**

The minimum level of service for the City's wastewater system, expressed as a per capita flow to be collected, treated and reclaimed shall be 81 gallons per capita per day. This level of service is an average daily flow based on the population served by the system and the system wide flows generated within the utility service area.

###### **Policy 1.1.2**

Peak design flows for the wastewater collection facilities shall range from 2.5 to 4.0 times the average daily flow. These criteria shall be included in the City's Land Development Regulations.

###### **Policy 1.1.3**

Peak hydraulic design flows for wastewater treatment facilities shall be no less than 2.0 times the average daily flow as calculated using the minimum level of service stated in Policy 1.1.1.

##### **Objective 1.2**

Identify and correct future deficiencies within the wastewater system through regular sewer evaluations and inspections and

include projects to address deficiencies in the City's Capital Improvements Program.

**Policy 1.2.1**

The City of Apopka shall continue to annually inspect all lift stations for the integrity of structures and equipment and shall conduct evaluations of lift station operating conditions.

**Policy 1.2.2**

The City of Apopka shall continue to evaluate and inspect sewer systems which are suspected to be contributing infiltration and inflow.

**Policy 1.2.3**

The City of Apopka shall continue to use video inspection techniques for regular sewer evaluation and inspection.

**Policy 1.2.4**

The City of Apopka shall update the wastewater collection system master plan every five years at a minimum.

**Objective 1.3**

To properly operate and maintain the city's existing and future wastewater collection, treatment, and reclamation facilities in accordance with local, state and federal regulations.

**Policy 1.3.1**

The City of Apopka shall sufficiently fund the cost of operations and maintenance to carry out Objective 1.3.

**Policy 1.3.2**

The City's wastewater treatment and reclamation facilities shall be operated and maintained under the supervision of state certified operators and in accordance with all permits issued by local, state and federal regulatory agencies.

**Policy 1.3.3**

Industrial discharges to the City's collection system shall receive adequate pretreatment in accordance with city code so that such industrial discharges do not adversely affect the operations of the City's wastewater treatment nor cause any

violation of the permits issued by local, state and federal regulatory agencies.

**Policy 1.3.4**

The City of Apopka shall continue to implement a comprehensive preventative maintenance program for all equipment in the wastewater system.

**Objective 1.4**

The City of Apopka shall assign the highest priority to cost-effective, beneficial uses of reclaimed water when developing future effluent disposal plans.

**Policy 1.4.1**

All future wastewater treatment facilities shall incorporate the necessary levels of treatment that will produce a cost effective, reclaimed water that is acceptable to local, state and federal regulatory agencies for irrigation on areas which are accessible to the public.

**Policy 1.4.2**

The City of Apopka shall update the master plan for the reclaimed water distribution system every five years at a minimum.

**Policy 1.4.3**

The City of Apopka shall continue to require the construction of dual water systems in future developments located within the reclaimed water service area which have access or are anticipated to have access to reclaimed water.

**Policy 1.4.4**

Within areas not already served by reclaimed water, the City of Apopka shall identify large potential users (i.e., golf courses, parks, recreational areas) and implement stormwater irrigation practices where practicable and financially feasible. Potential sites shall be evaluated independently on a case-by-case basis based on actual conditions.

**Policy 1.4.5**

The City of Apopka shall continue to require that new development reuse distribution points be connected to the

reclaim water system.

**Policy 1.4.6**

The City of Apopka will continue to use the reclaim water conservation rate structure that went into effect in on May 21, 2008 by Ordinance Number 2064.

**Policy 1.4.7**

The City of Apopka shall perform annual water audits to the reclaimed water treatment facilities using the AWWA water audit spreadsheet.

**Objective 1.5**

In order to discourage urban sprawl, expansion of the City's wastewater collection, treatment and reclamation facilities will only be allowed within the Utilities Service Area, as defined in the Interlocal Agreement with Orange County, and in accordance with the Capital Improvements Element to serve projected new development or redevelopment with levels of service that meet those adopted by the City.

**Policy 1.5.1**

The wastewater collection, treatment and reclamation facilities shall be provided by the applicant seeking a development permit and/or the City, in a timely manner that is concurrent with the impacts of development as required in the City's Concurrency Management System.

**Policy 1.5.2**

The internal wastewater facilities within future developments and/or redevelopments shall continue to be the responsibility of the applicant seeking a development permit and shall be designed and constructed in accordance with the most current edition of the Apopka Land Development Regulations.

**Policy 1.5.3**

Extensions to the wastewater collection and reclaimed water distribution systems shall be conducted in accordance with the appropriate master plan and the Capital Improvements Element.

**Policy 1.5.4**

The City of Apopka shall hereby update the 2005 Wastewater Master Plan Update and 2005 Reclaimed Water Master Plan Update, and shall incorporate them into this Comprehensive Plan.

**Policy 1.5.5**

The permanent use of septic tanks shall only occur for residential developments and neighborhood commercial uses if the following conditions apply:

- a) the septic tanks serve a lot of one acre or larger in size;
- b) a residential development within the City that is located more than one mile from the City's wastewater collection system. The one-mile distance shall be measured from the nearest lot line where the facilities are located; and
- c) it can be demonstrated through soil analysis, subdivision layout, or the use of enhanced technology that comparable groundwater protection can be achieved with small lots.

Exceptions to this policy may be granted by the City for infill projects. For the purposes of this exception provision, infill development shall be considered the development of vacant or underutilized parcels within the City's urbanized areas which are already largely developed. Designation as an infill project shall be done at the sole discretion of the city's Community Development Department (and in compliance with Policy 1.5.9.).

**Policy 1.5.6**

The City of Apopka shall review the Apopka Land Development Regulations annually for sufficiency of the wastewater guidelines. The Apopka Land Development Regulations shall be updated, at least every three years or more often as deemed necessary by the City, to reflect beneficial advancements in engineering, products and materials, construction and other appropriate areas.

**Policy 1.5.7**

Until such time the wastewater analysis has been completed, development within the portions of the Small Area Land Use Study Concept Plans (Northwest Area, West Area, Plymouth Area, and Western Expressway Corridor Area) not included in the 2020 Utility Master Plan shall be required to submit a utility analysis, which takes into account the impacts of proposed

utilities in the entire Small Area Land Use Study Concept Plan.

**Policy 1.5.8**

The City of Apopka has adopted a Wekiva Parkway and Protection Act Master Stormwater Management Plan Support Final Report in cooperation of the St. Johns River Water Management District. The City shall follow the intent of this Report.

**Policy 1.5.9**

The use of septic tanks for new developments may be undertaken on an interim basis, not to exceed five years, in cases where central sewer improvements necessary to serve the proposed development are scheduled for construction in the adopted Capital Improvements Program within that five year timeframe. The approval for and conditions of the use of septic tanks on an interim basis shall be at the sole discretion of the City.

**Policy 1.5.10**

Package plants shall not be permitted for any development within the City.

**Policy 1.5.11**

Where onsite disposal systems (OSDS or septic tanks) are permitted, protection of the environment shall be ensured through OSDS size requirements and the incorporation of a stringent level of wastewater treatment to reduce nitrate levels.

**Objective 1.6**

To treat and beneficially use the residuals of wastewater treatment in accordance with all applicable local, state and federal regulations.

**Policy 1.6.1**

The City of Apopka shall continue to use the current residuals management plan approved by the Florida Department of Environmental Protection.

**Policy 1.6.2**

The City of Apopka shall continue using residuals as a soil conditioner and fertilizer for appropriate agricultural

operations in conformance with local, state and federal regulations.

**Policy 1.6.3**

The City of Apopka shall consider participation in future regional approaches to residuals management that may involve several local governments.

## POTABLE WATER SUB-ELEMENT

### GOAL 2

To provide a safe and dependable water supply that is in compliance with local, state and federal regulations and that will be sufficient to meet the existing and future needs of the citizens residing in the utility service area.

#### Objective 2.1

The City's existing and future potable water system shall provide the following minimum levels of service.

##### Policy 2.1.1

The minimum level of service for the potable water system expressed as a per capita flow to be supplied, treated and distributed shall be 177 gallons per capita per day. This level of service is an average daily flow based on the population served by the system and the system wide flows generated within the utility service area. The per capita rate of gallons per day includes water demands for commercial, residential and unaccounted-for water.

##### Policy 2.1.2

The City shall seek to reduce the level of service from 177 gpcd to 166 gpcd in 2015; 154 gpcd in 2020; to 144 gpcd in 2025; and to 137 gpcd in 2030.

##### Policy 2.1.3

The minimum level of service for system pressure, under normal operating conditions, shall be 30 pounds per square inch (psi), as measured in the water main. During emergency conditions, power failures and/or fire flow conditions, water pressure shall be maintained at a minimum level of 20 psi or greater.

##### Policy 2.1.4

The City of Apopka shall provide sufficient water storage facilities to store a fire volume equal to four hours of fire flow, plus necessary operational storage. Operational storage shall be equal to the volume of water equivalent to the difference between peak hour and maximum day flow over a period of eight hours. This storage volume shall meet or exceed the storage volume requirements outlined in the

requirements of Florida Department of Environmental Protection (FDEP) Rule 62-555.348 and 62-555.320(19), F.A.C., and shall exceed 25% of the maximum daily demand.

**Policy 2.1.5**

Expansion of the design capacity of the Water Treatment Plant(s) will be consistent with the goals, objectives, and policies of the Comprehensive Plan and multi-jurisdictional water planning efforts in northwest Orange County.

**Objective 2.2**

Identify and correct future deficiencies within the potable water system through regular system evaluations and inspections and through the following policies.

**Policy 2.2.1**

The City of Apopka shall inspect all potable water facilities and conduct an annual evaluation of the performance of each water treatment plant. Deficiencies identified through this inspection shall be evaluated and corrective action shall be prioritized and implemented according to the objectives and policies of the Capital Improvements Element.

**Policy 2.2.2**

The City of Apopka shall continue its valve exercise and pipe flushing program.

**Policy 2.2.3**

The City of Apopka shall evaluate pressure complaints at least annually. Improvements needed to correct areas with deficient levels of service shall be identified.

**Policy 2.2.4**

The City of Apopka shall update the water system master plan every five years at a minimum. The Comprehensive Plan will be amended in accordance with the water system master plan and any revisions thereto.

**Policy 2.2.5**

All projects identified by the City to correct future deficiencies, that are considered cost effective, shall be

incorporated into the Capital Improvements Element for implementation.

### **Objective 2.3**

To properly operate and maintain the City's existing and future potable water supply, treatment and distribution facilities in accordance with local, state and federal regulations.

#### **Policy 2.3.1**

The City of Apopka shall sufficiently fund the cost of operations and maintenance to sustain adopted LOS standards.

#### **Policy 2.3.2**

The City's potable water supply, treatment and distribution facilities shall be operated and maintained under the supervision of state certified operators and in accordance with all permits issued by local, state and federal regulatory agencies.

### **Objective 2.4**

To use the lowest quality of water available and acceptable for the intended application according to the Potable Water Master Plan.

#### **Policy 2.4.1**

The City of Apopka shall continue to require the use of reclaimed water for irrigation and other beneficial uses where it is available or where it can be furnished in a cost effective manner in accordance with the City's master plan for the reclaimed water system and in accordance with local, state and federal regulations.

#### **Policy 2.4.2**

The City of Apopka shall continue to actively promote the use of reclaimed water by educating the public through use of the local media, educational programs at schools and civic organizations, and through other appropriate means.

### **Objective 2.5**

To conserve water resources by using appropriate water conservation techniques and implementing the water conservation plan.

**Policy 2.5.1**

The City of Apopka shall continue implementation of the Water Conservation Plan established in the City's CUP issued by the SJRWMD.

**Policy 2.5.2**

The City of Apopka shall continue to enforce state laws requiring the use of low volume plumbing fixtures for construction and/or redevelopment projects.

**Policy 2.5.3**

The City of Apopka shall continue to participate in water conservation projects or programs that will demonstrate to the public the use of drought tolerant landscape materials to achieve water conservation.

**Policy 2.5.4**

The City of Apopka shall implement the St. John River Water Management District's landscape irrigation rule through Ordinance Number 2172 entitled "Water Conservation Ordinance for Landscape Irrigation which was adopted on July 7, 2010.

**Policy 2.5.5**

The City of Apopka shall implement Ordinance Number 2069, adopted on May 21, 2008, which requires waterwise irrigation practices and the application of Florida Friendly landscape practices.

**Policy 2.5.6**

The City of Apopka shall establish a program to educate customers/groups within the City's Water Service Area on conservation practices, water quality, and the importance of water as a resource. The customer education program will use the following reach out methods:

- Presentations;
- Displays;
- Handouts;
- City's website;
- City's utility billing system; and

- Newspapers.

**Policy 2.5.7**

The City of Apopka will continue to use the potable water conservation rate structure that was adopted in May 21, 2008 by Ordinance Number 2064.

**Policy 2.5.8**

The City of Apopka will continue to utilize the City's Automatic Meter Reading (AMR) system to assist customers with indoor and outdoor leak detection. The AMR provides the city staff with the ability of increased usage tracking, real time consumption reading, and leak detection.

**Policy 2.5.9**

The City of Apopka shall continue to implement the Water Conservation Incentive Program that gives incentives for both commercial and residential water customers that were built prior to the adoption of the Ordinance 2069, May 2008, to retrofit irrigation systems to be more efficient. The incentive program includes; irrigation system evaluations, rain sensors, micro-irrigation retrofits, water conserving irrigation heads, and "smart" irrigation controllers.

**Policy 2.5.10**

The City of Apopka shall require irrigation systems to be in accordance with the most recent edition of the Florida Irrigation Standards Manual. The City of Apopka shall provide materials to customers on proper irrigation use and maintenance practice in accordance with the Apopka Land Development Code article 5.01.10 Irrigation.

**Policy 2.5.11**

The City of Apopka shall continue to use the mid-month high consumption notice program that was developed and distributed in October 2008. Notices will be sent to potable water customers half way through their billing cycle that have a usage which at the present trend will put them into the highest conservation rate structure or higher.

**Objective 2.6**

To provide a safe, dependable and adequate supply of water for potable uses within the utility service area, according to the

Potable Water Master Plan and the Water Supply Facilities Work Plan.

**Policy 2.6.1**

All future water production wells shall be drilled into the lower Floridan aquifer.

**Policy 2.6.2**

The City of Apopka shall expand well production capacity as needed to serve projected maximum daily demands for potable water within the utility service area.

**Policy 2.6.3**

The City of Apopka shall protect its potable water service by enforcing a wellhead protection zone, consisting of a 500' radius from the wellhead, in which potentially high risk land uses such as, but not limited to, industrial and manufacturing which use or store hazardous materials as defined by the U.S. Resource Conservation and Recovery Act and implemented by EPA are prohibited, consistent with FAC 62-521.200(7).

**Objective 2.7**

To maintain unaccounted for water at 10 percent or less of the total water pumped into the potable water distribution system.

**Policy 2.7.1**

The City of Apopka shall annually check the calibration of flow meters at the water treatment plants.

**Policy 2.7.2**

The City of Apopka shall continue the practice of routine meter change outs for large scale water users every five years.

**Policy 2.7.3**

The City of Apopka shall continue its meter testing and exchange program. Meters shall be replaced on a zero reading report and reading will be taken periodically.

**Policy 2.7.4**

The City of Apopka shall continue its leakage detection program.

**Objective 2.8**

To provide cost effective fire protection using the potable water system to protect the lives and property of the citizens living within the utility service area.

**Policy 2.8.1**

The potable water system shall be an integral part of the City's fire safety program. Fire flow standards shall be identified by the Fire Chief and incorporated into the potable water system master plan.

**Policy 2.8.2**

The City of Apopka shall continue the practice of testing fire hydrants in accordance with National Fire Protection Association Standards.

**Policy 2.8.3**

As the reclaimed water system develops, the City shall give consideration to the use of reclaimed water for fire protection in certain future low density residential developments where it is feasible.

**Objective 2.9**

Expand the potable water facilities and develop water supply sources in accordance with the Capital Improvements Element to serve projected new development and/or redevelopment with levels of service that meet or exceed those adopted by the City.

**Policy 2.9.1**

The potable water facilities shall be provided by the applicant seeking a development permit and/or the City, in a timely manner that is concurrent with the impacts of development as required by the policies of the comprehensive plan.

**Policy 2.9.2**

The internal potable water facilities within future developments and/or redevelopments shall be the responsibility of the applicant seeking a development permit and shall be

designed and constructed in accordance with the most current edition of the Apopka Land Development Regulations.

**Policy 2.9.3**

Extensions to the potable water system shall be conducted in accordance with the master plan and the Capital Improvements Element. The Comprehensive Plan will be amended in accordance with the water system master plan and any revisions thereto.

**Policy 2.9.4**

The City of Apopka shall review the Apopka Land Development Regulations annually for sufficiency of the potable water guidelines. The Apopka Land Development Regulations shall be updated, at least every three years or more often as deemed necessary by the City, to reflect beneficial advancements in engineering, products and materials, construction and other appropriate areas.

**Policy 2.9.5**

Until such time the water analysis has been completed, the portion of the Small Area Land Use Study Concept Plans (Northwest Area, West Area, Plymouth Area, and Western Expressway Corridor Area), not included in the 2020 Utility Master Plan, any development shall be required to submit a utility analysis, which take into account the impacts of proposed utilities in the entire Small Area Land Use Study Concept Plan.

**Policy 2.9.6**

All amendments to the Future Land Use Element map shall demonstrate that adequate potable and nonpotable water supplies and related facilities and sanitary sewer capacity are available to meet projected growth demands associated with the amendment.

**Objective 2.10**

The City has developed and will maintain a Water Supply Facilities Work Plan (work plan)(see Appendix 1 of the Infrastructure Data and Analysis) for at least a 10-year planning period. The work plan identifies traditional and alternative water supply sources and facilities and conservation and reuse that are necessary to meet the water needs of existing and future development within the jurisdiction of the City and the City's water service area.

**Policy 2.10.1**

The City shall update the Water Supply Facilities Work Plan within one year of updates of the SJRWMD district water supply plan that affects the City and will amend the comprehensive plan as necessary to incorporate changes to the background information and the adopted goals, objectives, policies, maps, and capital improvements schedules relative to the work plan update.

**Policy 2.10.2**

When updating the Water Supply Facilities Work Plan, the City shall seek alternative sources of water in order to meet projected demand increases.

**Policy 2.10.3**

The Water Supply Facilities Work Plan shall be used to set priorities and coordinate the expansion and upgrade of facilities used to withdraw, transmit, treat, store and distribute potable and nonpotable water to meet future demands.

**Policy 2.10.4**

The City shall establish and maintain, at a minimum, a current five-year schedule of capital improvements for the improvement, extension and/or increase in capacity of water and reclaimed water facilities.

**Objective 2.11**

The City shall identify sources of water that can be used to meet existing and future needs identified in the Water Supply Facilities Work Plan.

**Policy 2.11.1**

In conjunction with the SJRWMD and other local governments, the City shall seek the development of efficient, cost-effective and technically feasible water sources that will supplement future demands without causing adverse impacts to water quality, wetlands and aquatic systems. These sources may include, but are not limited to, surface water, reclaimed water and brackish groundwater.

**Policy 2.11.2**

The City shall maximize the use of existing potable water facilities through the implementation of management techniques that can enhance a source of supply, sustain water resources and related natural systems and/or optimize water supply yield. These techniques may include, but are not limited to, surface water, reclaimed water, system interconnects and water conservation.

**Policy 2.11.3**

The City's annual water consumption shall be equal to or less than the amount allocated under the SJRWMD-issued consumptive use permit.

**Policy 2.11.4**

In order to adequately assess the impact that a proposed development may have upon water supply and related facilities, the City shall, through its concurrency evaluation, assess the availability of adequate water supply and related facilities to serve the proposed development by the issuance date of the certificate of occupancy, development order or other milestone in advance of occupancy as determined by the City. The City will ensure that adequate water supplies and facilities are available and in place prior to issuing a certificate of occupancy or its functional equivalent.

## **STORMWATER MANAGEMENT SUB-ELEMENT**

### **GOAL 3**

To manage stormwater runoff in a manner that will protect the quality of surface and groundwater; preserve natural drainage ways and wetlands; minimize flooding and any other threats to the health safety and welfare of the citizens residing in the City of Apopka.

#### **Objective 3.1**

The City's future stormwater management facilities including those facilities serving redevelopments shall provide the following minimum levels of service as stated in the Apopka Land Development Regulations.

##### **Policy 3.1.1**

The City of Apopka shall continue to require that the post-development peak rate of discharge must not exceed the pre-development peak rate of discharge for the 25-year, 24-hour storm (8.6 inches of rainfall).

##### **Policy 3.1.2**

The City of Apopka shall continue to require that pollution abatement be accomplished by retention of runoff from the developed site with filtration into the soil through the bottom of the retention pond or through an approved filtering media consistent with the St. Johns River Water Management District's standards, unless more stringent measurements are required in other policies. The city shall require in its Land Development Regulations that stormwater treatment facilities be designed so that the quality of the stormwater runoff will not degrade the receiving water quality below the minimum conditions necessary to assure the suitability of the water body for the designated use, in accordance with the classifications established in Chapter 62-302.400, F.A.C.

##### **Policy 3.1.3**

The City of Apopka shall continue to require, where a positive outfall is not available for stormwater discharge, the 100-year, 24-hour storm (10.6 inches of rainfall) be retained on the site of the development. The retention pond shall be designed to percolate the total runoff volume within 72 hours following the rainfall event.

**Policy 3.1.4**

The City of Apopka shall continue to require, when runoff from a project is to be discharged to a landlocked lake with no positive outfall, that the on-site stormwater facilities be designed to detain the 25-year, 96-hour storm (12 inches of rainfall).

**Policy 3.1.5**

The level of service standard for flood protection within the City of Apopka shall be 100 year - 24 hour storm event. The city shall continue to require the finished floor of all inhabitable structures be located no less than 1-foot above the 100 year - 24 hour storm elevation.

**Policy 3.1.6**

The level of service standard for primary stormwater management facilities within the City of Apopka shall be the 25 year - 24 hour storm event.

**Policy 3.1.7**

The level of service standard for storm sewer systems within the City of Apopka shall be the 10 year storm event.

**Policy 3.1.8**

The City's land development regulations shall provide that no subdivision shall be platted nor shall construction commence for any multifamily, commercial, industrial or institutional project until the drainage design for such project has been approved by the city engineering division. The design shall meet or exceed design standards and the policies and procedures established by the SJRWMD, the Department of Environmental Protection, the Florida Department of Transportation, and the design criteria contained therein, and shall provide for retention and/or detention of stormwater runoff.

**Objective 3.2**

Restrict development within the 100-year flood plain to those uses that will not adversely affect the capacity of the flood plain to storm water.

**Policy 3.2.1**

The City of Apopka shall continue to require compensating storage for all flood water displaced by development below the elevation of the base 100-year flood.

**Policy 3.2.2**

The City of Apopka shall continue to require the finished floor of all inhabitable structures be located 1-foot above the base 100-year flood elevation.

**Policy 3.2.3**

The City of Apopka shall require where feasible the use of flood plain as conservation, open space and recreation in order to preserve the natural flood plain and vegetation.

**Objective 3.3**

To properly operate and maintain drainage facilities within the City in accordance with local, state and federal regulations.

**Policy 3.3.1**

The City of Apopka shall sufficiently fund the cost of operations and maintenance necessary to operate and maintain drainage facilities.

**Policy 3.3.2**

The City of Apopka shall maintain neglected private stormwater management facilities and the City's cost of maintenance shall be recovered from the private owner and/or operator of the facilities.

**Policy 3.3.3**

The City of Apopka shall continue to implement pro-active stormwater maintenance and inspection activities, as defined by the National Pollution Discharge Elimination System (NPDES) MS4 permit or by established programs such as, street sweeping; inspections and maintenance of outfalls; maintenance of catch basins and grates; and maintenance of other roadside drainage structures.

**Policy 3.3.4**

By May 2012, the City of Apopka shall implement identified recommendations in the Regional Master Stormwater Management Plan Support, dated November 2005, for the prioritized deficiencies (South Lake McCoy and Black Forest Court.)

**Objective 3.4**

The City of Apopka shall require erosion control practices to protect waterbodies and wetlands from siltation resulting from land that has been cleared for construction.

**Policy 3.4.1**

The City of Apopka shall require developers to disturb as little land as practicable. Those areas that are not to be disturbed shall be protected by an adequate barrier from construction activity. Natural vegetation shall be retained and protected.

**Policy 3.4.2**

The City of Apopka shall require that erosion and sediment control practices be used to protect water bodies, water courses and wetlands from siltation due to runoff from construction activities and/or from lands that have been cleared for construction. All sediment shall be retained on the site of construction.

**Policy 3.4.3**

The City of Apopka shall continue its street sweeping program to control the transport of sediments and other materials by stormwater runoff.

**Policy 3.4.4**

The City of Apopka shall maintain protection guidelines within the Apopka Land Development Regulations.

**Policy 3.4.5**

The City of Apopka shall by June 2011, amend the Land Development Code to include criteria to minimize erosion, sedimentation, and stormwater runoff within high recharge areas including restrictions on clearing of native vegetation and removal of topsoil.

**Policy 3.4.6**

The City of Apopka will continue to utilize best management practices, such as silt fences and sediment basins to retain sediment on site.

**Policy 3.4.7**

The City of Apopka shall by June 2011, amend the Land Development Code to incorporate karst stormwater management system design criteria.

**Policy 3.4.8**

The City of Apopka shall coordinate with the St. Johns River Water Management District and the Florida Department of Environmental Protection to develop performance standards for new facilities constructed in karst areas or that discharge into sinkholes. Such standards shall be included in the Apopka Land Development Code by June 2011

**Objective 3.5**

To expand the beneficial uses of areas designated for stormwater management by including in the city's Land Development Regulations provisions for the use of these areas as parks and other recreational uses.

**Policy 3.5.1**

Encourage creative planning of stormwater retention/detention areas to include facilities for parks and recreation.

**Policy 3.5.2**

Encourage the use of wetlands and other unique natural areas in stormwater management plans to ensure their viability and preservation.

**Policy 3.5.3**

The City of Apopka shall require where feasible the planting of littoral zone vegetation in stormwater ponds and/or lakes to provide a natural system for the uptake of nutrients and other constituents transported by stormwater runoff.

### **Objective 3.6**

The City of Apopka shall implement the projects identified in the Capital Improvements Element.

#### **Policy 3.6.1**

The City of Apopka shall conduct annual inspections of all drainage facilities. Any deficiencies identified shall be corrected or corrective measures incorporated into the Capital Improvements Element.

#### **Policy 3.6.2**

The City of Apopka shall investigate cost effective and practical methods to provide stormwater treatment in accordance with the adopted level of service standards for existing systems that discharge untreated stormwater to surface waters by December 2012. The City will implement those retrofit projects that are considered necessary for the city to comply with future National Pollutant Discharge Elimination System (NPDES) permit requirements.

#### **Policy 3.6.3**

The City of Apopka shall eliminate the use of drainage wells that are solely under the City's control and where practical and cost effective alternatives for stormwater management can be developed and incorporated into the Capital Improvements Element.

### **Objective 3.7**

Expand stormwater management facilities to serve projected new developments and/or redevelopments that meet the levels of service adopted by the city.

#### **Policy 3.7.1**

Stormwater management facilities shall be provided by the applicant seeking a development permit and/or the City, in a timely manner that is concurrent with the impacts of development as required in the concurrency management system.

#### **Policy 3.7.2**

The internal stormwater management facilities within future developments and/or redevelopments shall be the responsibility of the applicant seeking a development permit and shall be

designed and constructed in accordance with the most recent edition of the Apopka Land Development Regulations.

**Policy 3.7.3**

The City of Apopka shall not permit the construction of drainage wells for future projects.

**Policy 3.7.4**

The City of Apopka shall review the Apopka Land Development Regulations annually for sufficiency of the stormwater guidelines. The Apopka Land Development Regulations shall be updated, at least every three years or more often as deemed necessary by the City, to reflect any beneficial advancements in engineering, products and materials, construction and other appropriate areas.

**Policy 3.7.5**

By September 2010, the City of Apopka shall update and maintain its master stormwater management plan to, at a minimum, address the requirements of the Wekiva Parkway and Protection Act and include the following: data collection; identification of problem areas; hydraulic/hydrologic analysis of the primary stormwater management system; water quality; recommendations, estimated costs for capital improvements.

**Policy 3.7.6**

The City of Apopka shall evaluate and identify Surface Water Conservation, Treatment and Flood Control Management Strategies, Groundwater Protection and Reuse Management Strategies Capital Improvement Programs contained in the Wekiva Parkway and Protection Act Master Stormwater Management Support Document, dated November 2005 for subbasins (receiving a rank of "1" and "2" by 2010, and implement financially feasible projects by 2012; evaluate and identify CIPs for subbasins receiving a rank of "3" and "4" (or higher) by 2012, and implement financially feasible projects by 2017.

**Policy 3.7.7**

As part of the periodic updates to its master stormwater management plan, the City shall evaluate improvements to its maintenance programs based on the information presented in the Master Stormwater Management Plan and familiarity with its program.

### **Objective 3.8**

Create a source of revenue to fund necessary capital improvements to solve existing drainage problems, operations and maintenance costs attributed to the drainage system and other appropriate costs.

#### **Policy 3.8.1**

The City of Apopka shall continue to use the stormwater utility as authorized by the City Council using the non-ad valorem fee collection method as provided in Section 403.0893, F.S., as the source to fund the capital improvement projects.

#### **Policy 3.8.2**

The City of Apopka shall require a regionalized approach to stormwater management for all future development and redevelopment projects where the regionalized approach will be more cost effective to design, construct, operate and maintain.

#### **Policy 3.8.3**

The City of Apopka shall continue a dedicated funding source, such as the stormwater utility fee, that can be used for planning, implementation and operations and maintenance of regional projects within the Wekiva Study Area.

### **Objective 3.9**

To educate the citizens of Apopka on the environmental effects of stormwater runoff, the stormwater management needs of the community and ways in which the public can help in managing stormwater runoff.

#### **Policy 3.9.1**

The City of Apopka shall continue the public education program on stormwater management.

### **Objective 3.10**

To recognize that drainage and stormwater management issues transcend corporate and jurisdictional boundaries and that cooperation with other local government may be necessary for the City to provide the required level of service.

**Policy 3.10.1**

The City of Apopka shall coordinate with adjoining local governments to address stormwater issues of mutual concern.

## NATURAL GROUNDWATER AQUIFER RECHARGE SUB-ELEMENT

### GOAL 4

The Floridan and surficial aquifers shall be protected to ensure that City of Apopka residents and businesses have an adequate supply of potable water now and in the future, in accordance with 163.3177(6)(c), Florida Statutes.

#### Objective 4.1

The City of Apopka shall establish local programs that protect the aquifers, including developing criteria for the Apopka Land Development Regulation.

##### Policy 4.1.1

The Apopka Land Development Regulations shall contain a definition and a generalized map of aquifer recharge areas in the city. This map shall be based on the SJRWMD maps.

##### Policy 4.1.2

The City of Apopka shall continue to require all new development to retain minimum of ½ inch of run-off from the entire project site. However, retaining 3 inches of runoff from the directly connected impervious area within the project site shall be required unless it is demonstrated that post-development recharge is equal or greater than pre-development recharge as stipulated in Section 40C-41, FAC.

##### Policy 4.1.3

Within one year after the St. Johns River Water Management District update guidelines to protect, replenish and maintain critical aquifer recharge areas and the groundwater basin; the City of Apopka shall incorporate pertinent restrictions into the Apopka Land Development Regulations.

##### Policy 4.1.4

The City of Apopka shall direct incompatible land use away from high recharge areas, including mining as well as industrial and commercial uses with extensive impervious surfaces.

**Policy 4.1.5**

The City of Apopka shall use best management practices and performance standards to maximize open space, limit impervious surfaces and turf grass areas, promote protection of natural vegetation, promote the use of pervious parking areas, and treat stormwater to protect water quality.

**Objective 4.2**

The City of Apopka shall coordinate with other governmental entities regarding groundwater pollution through the establishment or continuation of programs and technical assistance.

**Policy 4.2.1**

The City of Apopka shall cooperate with the St. Johns River Water Management District to prepare a Groundwater Basin Resource Availability Inventory.

**Policy 4.2.2**

The City of Apopka and the St. Johns River Water Management District shall continue working together to eliminate potential pollution sources that could contaminate water that percolates into the aquifers. These sources may include improperly installed or malfunctioning septic tanks by requiring property owners who fail to correct system deficiencies to connect to the city wastewater system. This shall be an on-going effort.

**Policy 4.2.3**

The use of septic tanks shall not be permissible within the corporate limits of Apopka for other than residential uses when both of the following conditions apply: the septic tanks serves a lot of one acre or larger in size, and wastewater collection facilities are further than one mile, to be measured from the nearest lot line where the facilities are located.

**Policy 4.2.4**

The use of septic tanks within environmentally sensitive lands shall be prohibited.

**Policy 4.2.5**

The use of septic tanks for new developments may be undertaken on an interim base, not to exceed five years, in cases where central sewer improvements necessary to serve the proposed development are scheduled for construction in the adopted Capital Improvements Program within that five year time-frame. The approval for and conditions of the use of septic tanks on an interim basis shall be at the sole discretion of the City.

**Policy 4.2.6**

The City shall require underground storage tanks be installed pursuant to Chapters 489 and 376, F.S.

**Policy 4.2.7**

In order to protect groundwater resources, all new development shall be required to demonstrate that pre-and post-development recharge shall be equal.

**OBJECTIVE 4.3**

The quality of the City of Apopka's groundwater resources shall be maintained at or above state standards through the establishment of the following policies.

**Policy 4.3.1**

The City of Apopka hereby adopts the Department of Environmental Protection's water quality standards and shall cooperate with the Department of Environmental Protection and St. Johns River Water Management District, to monitor groundwater quality and levels.

**Policy 4.3.2**

In order to adequately assess the impacts that proposed Comprehensive Plan amendments may have upon groundwater supply, the City of Apopka shall specifically address all issues consistent with the St. Johns River Water Management District Potable Water Availability Worksheet, when analyzing any proposed amendments.

**A. Infrastructure Information**

Water treatment plant permit number;

Permitting agency;

Permitted capacity of the water treatment plant(s):

\_\_\_\_\_ million gallons a day (mgd)

Total design capacity of the water treatment plant(s):

\_\_\_\_\_ mgd

Availability of distribution lines to serve the property

Availability of reuse distribution lines available to serve the property

**B. SJRWMD Consumptive Use Permit (CUP) Information**

CUP Number:

Expiration date:

Total CUP duration (years):

CUP allocation in last year of permit:

Current status of CUP:

Allocations to other local governments:

Reserved capacity:

**C Consumptive Use Analysis**

Current year CUP allocation:

Consumption in the previous calendar year:

Amount of capacity to be reserved for the proposed comprehensive plan amendment areas:

The amount of reserved capacity (potable water capacity currently encumbered for developments that are approved but not yet constructed) or a growth projection (current year's projected growth in service area)

Amount available for all other future uses:

**Policy 4.3.3**

The City of Apopka's update to the Groundwater Recharge Sub-element of its comprehensive plan pursuant to Section 163.3181, Florida Statutes, Evaluation and Appraisal Reports, will be supplemented as appropriate based on the recommendations of the Wekiva River Basin Coordinating Committee as provided by law.

**OBJECTIVE 4.4**

The City will revise its land development regulations to incorporate regulations protecting the functions of groundwater recharge areas, springs, and springsheds by January 2011.

**Policy 4.4.1**

New development will be required to maintain surface and groundwater flow rates and volumes at pre-development levels so that the natural function of groundwater recharge areas is maintained.

**Policy 4.4.2**

Substantial redevelopment projects shall comply with the standards for stormwater runoff that apply to new development.

Substantial redevelopment shall be based upon the value and amount of cumulative improvements to the site.

**Policy 4.4.3**

Best management practices shall be used in combination as part of a BMP treatment train to protect water quality and minimize flooding. BMPs shall be used in the design of stormwater management facilities and systems. The following stormwater BMPs shall be instituted to reduce nitrate loading within:

1. Vegetated infiltration areas shall be encouraged for stormwater treatment and management on all sites except when soil, topography, or seasonal high water conditions are inappropriate for infiltrations as determined by a professional engineer licensed in the State of Florida.
2. Whenever infiltration systems are not feasible, wet detention systems shall be used for stormwater treatment and management.
3. Sensitive karst features, including sinkholes with a direct connection to the aquifer and stream-to-sink features, shall not be utilized as stormwater management facilities. Prior to subdivision approval, all depressions will be investigated by a licensed professional using a professionally acceptable methodology for suitability of water retention using generally accepted geo-technical practices with an emphasis on identification of potential connections to the aquifer. If connections are determined to exist, the depression shall not be used for stormwater retention and the area draining to this feature under pre-development conditions shall be preserved through a conservation easement.
4. All development approval by the City shall require the applicant to submit to the City a copy of the FDEP

stormwater permit and the NPDES notice of intent to be covered by the construction generic permit prior to any land clearing.

5. Sensitive karst features will be identified and placed in a conservation easement so that they will be thereafter used solely for passive recreation are defined as any open sinks, relic sinks with a direct connection to the aquifer and springs to sink systems.
6. All components of the stormwater treatment and management system shall be in common ownership and shall be maintained by the responsible legal entity identified in the DEP stormwater permit, typically a homeowner or property owners association.

#### **Policy 4.4.4**

For sub-basins in the Wekiva Study Area identified with predicted percent increases in pollutant loads between existing and future conditions the City of Apopka shall evaluate the use of controls in addition to what is already required for stormwater treatment by City regulations and permitting agencies, where most beneficial and where feasible, by May 2010. The types of controls to be evaluated will utilize the Best Management Practices (BMPs) include the following, at a minimum:

- Stormwater Reuse
- Reservoirs/Ponds
- No Net Floodplain Loss
- Stormwater Infiltration Basins (SIBs)
- Buffers
- Recharge Rule
- Retention
- Detention
- End-of-Pipe Treatments
- Drainage Well / Recharge Well & Treatment System
- Agricultural Nonpoint Source Pollution Management
- Water Wise Landscaping and Reduced Turf Area
- Public Outreach / Education for Proper Management and Use of Fertilizers

## **SOLID WASTE SUB-ELEMENT**

### **GOAL 5.0**

Provide efficient and safe solid waste collection service to accommodate existing and future demands.

#### **Objective 5.1**

Provide adequate routes, equipment and manpower to accommodate existing and future demands by implementing the following policies.

##### **Policy 5.1.1**

The City of Apopka shall maintain a rate structure that is fair to the consumer and which covers the cost of operating the solid waste collection and disposal system. Funds shall be provided by means of user fees and available county, state, and federal funds.

##### **Policy 5.1.2**

The City of Apopka shall use a level of service standard of 4 pounds per capita per day for residential and 2 pounds per capita per day for 1,000 square feet of commercial development to determine the availability of facility capacity for solid waste disposal services (this total includes residential and non-residential generation).

##### **Policy 5.1.3**

The City of Apopka shall coordinate with Orange County to provide development information for adequate disposal facility allocation.

##### **Policy 5.1.4**

The City of Apopka shall coordinate with Orange County to ensure adequate transfer station facilities are provided to accommodate northwest Orange County needs in an efficient and cost-effective manner.

##### **Policy 5.1.5**

The City of Apopka shall provide equipment and manpower necessary to accommodate the collection standard of curbside collection, twice per week, for residential class customers and as needed, available one to seven days per week, to commercial class customers.

## **Objective 5.2**

The City of Apopka will continue its recycling efforts by supporting Orange County's effort to reduce the total waste stream through recycling.

### **Policy 5.2.1**

The City of Apopka will continue to expand the current voluntary residential recycling program.

### **Policy 5.2.2**

The City of Apopka will continue to cooperate with Orange County and other signatories of the Interlocal Solid Waste Management Agreement to develop new recycling programs.

### **Policy 5.2.3**

The City of Apopka will cooperate with Orange County and other local municipalities to pursue new technologies for collecting and processing recyclable material.

## **Objective 5.3**

The City of Apopka shall protect the health, safety, and welfare of the public from the harmful effects of hazardous wastes by cooperating with the Florida Department of Environmental Protection (FDEP) and Orange County Environmental Protection Department (OCEPD) in the regulation and disposal of hazardous wastes.

### **Policy 5.3.1**

The City of Apopka shall continue to coordinate with Orange County in its emergency response plan to handle accidents involving hazardous wastes.

### **Policy 5.3.2**

The City of Apopka shall continue to coordinate with Orange County Environmental Protection Department to hold household hazardous waste round-up programs in the Apopka area.

### **Policy 5.3.3**

The City of Apopka shall distribute educational material regarding household hazardous wastes provided by FDEP to City solid waste customers.

**Policy 5.3.4**

The City of Apopka shall promote the recycling of hazardous wastes (e.g., waste oil) by publishing a list of approved recyclers.

**Policy 5.3.5**

The City of Apopka Land Development Regulations shall require evidence of compliance with Orange County Small Quantity Generator Notification Program prior to issuance of an occupational license.

# APPENDIX 1

City of Apopka Water Supply Facilities Work Plan

# City of Apopka Water Supply Facilities Work Plan

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## City of Apopka

|                                 |  |
|---------------------------------|--|
| Mayor                           | John H. Land   |
| City Commissioners              | J. William Arrowsmith<br>Billie L. Dean<br>Marilyn Ustler McQueen<br>Kathy S. Till |
| Public Services<br>Director     | John Jreij, PE   |
| Chief Administrative<br>Officer | Richard Anderson   |

November 22, 2006  
Revised July 5, 2010 / City of Apopka

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# City of Apopka Water Supply Facilities Work Plan

## INTRODUCTION

Preparation of the City of Apopka Water Supply Facilities Work Plan is in response to a requirement by the 2002 Florida Legislature expanding the local government comprehensive plan requirement to strengthen coordination of water supply planning and local land use planning. The Water Supply Facilities Work Plan should ensure the construction of water supply facilities that are necessary to serve existing and new development for at least a 10-year planning period. Specifically this must include:

1. Project the local government's needs for at least a 10 year period;
2. Identify and set priorities for the water supply facilities;
3. Identify and set priorities for the water supply source(s) to meet the needs;
4. Include those capital improvements identified in the Work plan in the City's Five-Year Schedule of Capital Improvements. Revenue sources must be identified. Further, a current five-year schedule must always be maintained.

This analysis must consider the following three items:

1. City's existing facilities;
2. An analysis of system capacity, surpluses and deficiencies, facility needs, and identify a sufficient supply of water to meet projected needs; and
3. Revisions to the City's Comprehensive Plan elements to integrate the Work Plan into the Comprehensive Plan.

The analysis identifying water supply needs must be coordinated with the St. Johns River Water Management District (District). In 1997, the Florida Legislature amended the Florida Water Resources Act (Chapter 373, F.S.) to require all the districts to initiate regional water supply planning where reasonable anticipated sources of water were deemed inadequate to meet year 2020 projected demands. These water supply plans include a list of water source options that will meet anticipated demands while sustaining water resources and related natural system. The District plan was completed in 2005 and amended most recently on May 12, 2009.

The requirements of this Work Plan have also been impacted by the Wekiva Parkway and Protection Act, which was signed on June 29, 2004.

The requirements of this Work Plan are being impacted by the City's acquisition of Orange County infrastructure in the northwest corner of Orange County in April 2006.

State Law requires this approved Work Plan to be complete, comprehensive plan amendments submitted to DCA and all elements adopted by December 1, 2006 (and implementing land development regulations are due January 1, 2007). These dates are subject to change by the Legislature. The Water Supply Facilities Work Plan is pursuant to the proposed Objective 2.10 of the Infrastructure Element of the City's Comprehensive Plan.

## **WATER SUPPLY AND FACILITIES INFORMATION**

### **Geographic Area**

The City of Apopka water system has historically coincided with the City's current urban service area. The boundary for the service area contains approximately 68 square miles. The City's service area expanded with the acquisition of facilities from Orange County. Refer to Appendix E of this Plan and Map 4-1 of the Infrastructure Element.

### **Water Sources and Collection Facilities**

Apopka's drinking water sources taps the Lower Floridan Aquifer. All of these sources are located in northwest Orange County. Locations of the water treatment plants (WTP) within the City are also listed on Map 4-1 previously referenced from the Infrastructure Element. The City currently owns 5 WTPs including 2 WTPs that were purchased from Orange County. The wells located at these WTPs are listed in Table 1.

### **Aquifer Recharge And Well Head Protection**

The City relies on the Floridan aquifer for water supply, thus, protection of recharge areas and the protection of groundwater quality are prime concerns of the City. The Floridan aquifer is primarily recharged by rainfall. Direct rainfall and stormwater runoff migrates downward through the porous soils to replenish the groundwater. Recharge areas typically are characterized by well drained soils, which also tend to be well suited for development. However, development potentially restricts recharge capacity by covering the land with impervious surfaces such as roads, parking lots and buildings. The City has adopted SJRWMD's regulation for groundwater recharge requirements.

Generally, wellhead protection is concerned with regulating potential sources of groundwater contamination in the vicinity of water supply wells. Some business activities require the use of chemicals and the disposal of wastes. There is a potential for groundwater contamination by the improper use of chemicals and/or the improper disposal of chemicals and wastes. The City has adopted an ordinance to regulate land use and/or business activity in the vicinity of water supply wells to minimize potential threats to the quality of the groundwater. Policies have been added to the Infrastructure Element and the Future Land Use Element to ensure the protection of the City's water sources (see IE 2.6.3, FLUE 4.11, CE 2.1, and ICE 5.2).

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**Table 1**  
**Summary of Facilities**  
**Existing 2010 Water Treatment Plants**  
**City of Apopka**

| <b>Plant</b>         | <b>Rated Well Pump Capacity (gpm)</b> | <b>Well Casing Size (inches)</b> | <b>High Service Pumps (gpm)</b> | <b>Total High Service Pumping Capacity (gpm)</b> | <b>Total High Service Pumping Capacity per Plant (gpm)*</b> | <b>Type of Storage</b> | <b>Storage Capacity (million gallons)</b> | <b>Treatment</b>                                       |
|----------------------|---------------------------------------|----------------------------------|---------------------------------|--|---|------------------------|---|--|
| Myrtle Rogers Womble | 3,500<br>3,500                        | 24<br>24                         | 2500<br>2500                    | 5,000  | 2,500   | Ground                 | 1   | Aeration and Chlorination                              |
| Grossenbacher        | 1,000<br>3,500<br>3,500               | 12<br>20<br>20                   | 2400<br>3500<br>3500<br>3500    | 12,900   | 9,400   | Ground<br>Ground       | 0.5<br>1                                  | Aeration and Chlorination<br>Aeration and Chlorination |
| Sheeler Oaks         | 2,500<br>2,500                        | 18<br>18                         | 1950<br>1950<br>1500<br>1250    | 6,650  | 4,700   | Ground                 | 1   | Aeration and Chlorination                              |
| Plymouth Regional    | 400<br>500<br>500                     | 8<br>14<br>14                    | 1800<br>1800<br>400<br>400      | 4400   | 2600  | Ground                 | 0.75                                      | Chlorination   |
| Mount Plymouth       | 1000<br>1000                          | 12<br>10                         | 1000<br>1000<br>1000<br>580     | 3580   | 2580  | Ground                 | 0.5                                       | Aeration and Chlorination                              |
| <b>Total System</b>  | <b>23,400</b>                         |                                  |                                 | <b>32,530</b>                                    | <b>21,780</b>   |                        | <b>4.75</b>                               |  |

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## Treatment Facilities

Apopka's drinking water treatment facilities include the 5 water plants as shown on Map 4-1 of the Infrastructure Element. A sixth water treatment facility (Southwest) is planned for the future. Water treatment practice in Apopka consists of tray aeration followed by chlorination. Aeration and chlorination work together to remove hydrogen sulfide from the raw water and to disinfect the finished water. The 2005 Potable Water Master Plan Update includes a flow schematic (see Figure 2-2) that is typical of the City's WTPs.

### *Grossenbacher WTP*

The Grossenbacher WTP is the oldest and largest of the treatment plants operated by the City. A summary of its capacities is presented in Table 1. The "firm" capacity of a process, such as high service pumping, is defined as the total capacity of all units of that process less the capacity of the largest unit, which is assumed to be out of service. Assumptions concerning the requirements for backup equipment and firm capacities at the treatment plants are discussed in the Water Supply Master Plan.

Like most wells drilled into the lower Floridan aquifer, H<sub>2</sub>S is present in the City's well water. The Grossenbacher WTP uses aeration and detention treatment for H<sub>2</sub>S removal as well as chlorination treatment for disinfection.

### *Sheeler Oaks WTP*

The Sheeler Oaks WTP is located in the Southeastern portion of the service area. The treatment process for this plant is similar to that described for the Grossenbacher WTP. A summary of its capacities is given in Table 1.

### *Myrtle Rogers Womble WTP*

The Myrtle Rogers Womble WTP (previously known as the Northwest WTP) is the newest of the City's water treatment plants, having been placed in service in 1999. The WTP is located in the northern part of the service area and a description of its capacities is given in Table 1.

### *Plymouth Regional WTP*

The Plymouth Regional WTP is located in the western portion of the service area and currently serves a few small residential communities as well as commercial and industrial users along West Orange Blossom Trail. The treatment process for the WTP does not include aeration, but consists of disinfection and ground storage. A description of its capacities is given in Table 1.

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### *Mount Plymouth Lakes WTP*

The Mount Plymouth Lakes WTP is located in the northeastern portion of the service area and currently serves a several small residential communities near the Orange County Kelly Park. The treatment process for the WTP is similar to that described for the Grossenbacher WTP. A description of its capacities is given in Table 1.

### **Major Distribution and Transmission Facilities**

The current water distribution system, not including on-site piping at the treatment plants, consists of pipes ranging in diameter from 3-inch to 36-inches, fire hydrants and isolation valves. There is currently no elevated storage serving the distribution system. Generally, pipes 12-inches in diameter and smaller are of polyvinyl chloride (PVC) construction whereas larger pipes are constructed from ductile iron. Improvements to the distribution/transmission system have generally followed the recommendations outlined in the most recent master plan, with the timing of specific projects dependent on development patterns. The following table lists the various lengths of pipe in the system for 3 inches and larger. That portion of the City's water system which was purchased from the County in 2006 is included in the table below.

**Table 2**  
**Potable Water Distribution/Transmission System**  
**City of Apopka**

| <b>Size (inches)</b> | <b>Total*<br/>Length (feet)</b> |
|----------------------|---------------------------------|
| 3                    | 19,549                          |
| 4                    | 95,264                          |
| 6                    | 455,081                         |
| 8                    | 509,582                         |
| 10                   | 92,814                          |
| 12                   | 276,603                         |
| 14                   | 8,897                           |
| 16                   | 180,081                         |
| 18                   | 473                             |
| 20                   | 3,260                           |
| 24                   | 9,260                           |
| 30                   | 5,540                           |
| 36                   | 58                              |

\*Per City GIS June 1, 2010

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### Storage Facilities

As previously identified in Table 1 there are a total of 6 ground storage tanks (GST) within the City's water distribution system with a total capacity of 4.75 million gallons (mg).

### Permit Conditions and Duration

The City has a Consumptive Use Permit (CUP) from the District for its potable water supply system. The CUP has recently been renegotiated to combine #3217, #50172 and #100495 under one CUP, numbered #3217.

CUP #3217

Date: May 10, 2005

Maximum ADF: 10.358 mgd in 2007

Maximum Annual Use: 3780.7 Million Gallons in Year 2007

Expiration Date: May 11, 2007

The City is permitted to augment their reclaimed water supply.

CUP #50172

Date: May 10, 2005

Maximum ADF: 2.5 mgd in Year 2007

Maximum Annual Use: 912.5 Million Gallons in Year 2007

Expiration Date: Expiration Date: May 11, 2007

With the two WTPs, the City has acquired a portion of the Orange County CUP from the District for its potable water supply system (Zellwood augmentation of 0.15 mgd is addressed in the reclaimed water supply augmentation).

CUP #100495

Date Original Permit Issued: October 6, 2005

Date of Transfer: June 21, 2006

Maximum ADF: Estimated to be 2.80 mgd in Year 2010

Maximum Annual Use: 397.80 Million Gallons in Year 2010

Expiration Date: July 12, 2020

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### **Reclaimed Water System(s)**

The City of Apopka furnishes reclaimed water to a number of users through its Project ARROW (Apopka Regional Reuse of Water) distribution network. The Apopka Water Reclamation Facility (WRF) is currently the only source of reclaimed water for the City's system. The City has a reclaimed water pump station at the WRF and a re-pump station in the northern part of its service area. The North Pump Station is located adjacent to the Myrtle Rogers Womble WTP.

#### *Apopka WRF*

The Apopka WRF provides advance secondary treatment along with high level disinfection to produce reclaimed water that is suitable for use on public access areas like golf courses and home lawns. The Apopka WRF is permitted for a capacity of 4.5 million gallons per day (mgd). The City has received their Florida Department of Environmental Protection (FDEP) permit to expand the WRF to a capacity of 8.0 mgd. The WRF site has three wells that the City uses to supplement the supply of reclaimed water. The WRF has 4 million gallons (mg) of covered storage tank capacity and 25 mg of storage pond capacity. The City will begin the WRF project expansion from 4.5 mgd to 8.0 mgd in 2010 and be completed in 2012. The 8.0 mgd treatment capacity will be sufficient to satisfy the anticipated demand for the year 2030. The construction of an additional 2 mg covered storage tank will be completed in 2015.

#### *North Pump Station*

The North Pump Station functions as a re-pump station for reclaimed water. During the day when demands for reclaimed water are low, the storage tank on the pump station site is filled by the reclaimed water transmission system from the WRF. During the early morning hours when irrigation demands increase, the North Pump Station pumps reclaimed water from the storage tank to the transmission system. The North Pump Station currently has two 2 mg ground storage tanks (GST).

The City has other storage facilities within its reclaimed water system. The Rock Springs Ridge Golf Course features three storage ponds with 20 mg of holding capacity. In addition, the City recently completed construction of a storage pond with approximately 120 mg of capacity at its Northwest Recreation Center. This storage pond receives a combination of reclaimed water and stormwater runoff. Table 3 summarizes the City's pumping and storage facilities.

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**Table 3**  
**Summary of Facilities**  
**Existing 2010 Reclaimed Water Pumping and Storage Facilities**  
**City of Apopka**

| <b>Facility</b>                | <b>High Service Pumps (gpm)</b> | <b>Total High Service Pumping Capacity (gpm)</b> | <b>Ground Storage (mg)</b> | <b>Pond Storage (mg)</b> |
|--------------------------------|---------------------------------|--|----------------------------|--------------------------|
| Apopka WRF                     | 1,400                           | 10,800   | 1                          | 16                       |
|                                | 1,400                           |  | 1                          | 9                        |
|                                | 1,400                           |  | 2                          |                          |
|                                | 1,400                           |  |                            |                          |
|                                | 2,600                           |  |                            |                          |
|                                | 2,600                           |  |                            |                          |
| North Pump Station             | 3,750                           | 7,500  | 4                          |                          |
|                                | 3,750                           |  |                            |                          |
| Rock Springs Ridge Golf Course |                                 |  |                            | 20                       |
| NW Recreation Center           |                                 |  |                            | 120                      |
| <b>Total System</b>            |                                 | <b>18,300</b>                                    | <b>8</b>                   | <b>165</b>               |

**Major Reclaimed Water Distribution and Transmission Facilities**

The current reclaimed water distribution system, not including on-site piping at the pump stations, consists of pipes ranging in diameter from 4-inch to 36-inches. Generally, pipes 12-inches in diameter and smaller are of polyvinyl chloride (PVC) construction whereas larger pipes are constructed from ductile iron. Improvements to the distribution/transmission system have generally followed the recommendations outlined in the most recent master plan, with the timing of specific projects dependent on development patterns. Table 4 lists the various lengths of pipe in the system.

**Table 4**  
**Reclaimed Water Distribution/Transmission System**  
**City of Apopka<sup>(1)</sup>**

|                      | <b>Total</b>         |
|----------------------|----------------------|
| <b>Size (inches)</b> | <b>Length (feet)</b> |
| 4                    | 61,670               |
| 6                    | 179,626              |
| 8                    | 96,518               |
| 10                   | 29,938               |
| 12                   | 94,723               |
| 14                   | 4,066                |
| 16                   | 5,702                |
| 18                   | 3,062                |
| 20                   | 39,494               |
| 24                   | 4,066                |
| 30                   | 18,163               |
| 36                   | 475                  |

<sup>(1)</sup>Per City GIS June 11, 2009

*North Shore-Reclaimed Water Pump Station*

The proposed City of Apopka North Shore Reclaimed Water Pump Station is located in the southwestern section of the City’s service area. Originally conceived as just a pump station, the City of Apopka is now engaged in a project to assess the feasibility of using water from the North Shore of Lake Apopka as a supplemental water source for the reclaimed water system (see below). The master planning of this pump station was included in the City of Apopka 2005 Reclaimed Water System Master Plan Update, dated August 2005 and prepared by Boyle Engineering Corporation. The North Shore Reclaimed Water Pump Station is proposed to eventually consist of the following:

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- Surface Water Treatment System
- Two 3 million gallon pre-stressed concrete tanks
- One concrete block building to house electrical equipment (with air conditioning), chemical feed storage area and chemical feed pumps
- Five VFD driven pumps each rated at approximately 4,500 gallons per minute (gpm) at full rated speed
- Emergency generator system to power at least two pumps
- Plant site work
- Plant yard piping, electrical and controls systems
- Miscellaneous other improvements

Timing of individual aspects of this project will occur as needed over the next 20 years.

### *Supplemental Water Supply from the North Shore Restoration Area*

The City of Apopka, in conjunction with the SJRWMD, is exploring the possibility of using water from the canal system on the North shore of Lake Apopka as a supplemental source for the City's reclaimed water system. The City is assessing the feasibility of treating the lake water to reclaimed water standards. The City is planning to withdraw up to 5 mgd from the North Shore. The recommended treatment approach is summarized in the report titled Lake Apopka Reclaimed Water Supplement Technical Report, dated May, 2006 and prepared by Boyle Engineering Corporation. The North Shore Reclaimed Water Pump Station will play a significant role in meeting the demands for irrigation water within Apopka's service area. Construction of the North Shore Reclaimed Water Augmentation project is expected to be completed in the year 2014.

The MOA for the NSRA at Lake Apopka was executed by the City of Apopka on January 5, 2009. The MOA allows for the City to lease District lands located on the shores of Lake Apopka, commonly referred to as the North Shore Restoration Area (NSRA). On the leased District property the City will construct a reclaimed water facility which will remove water from the Lust Road Canal and treat it to the reclaimed water standards set forth by the Florida Department of Environmental Protection (FDEP). The District has issued Consumptive Use Permit No. 102497 to allow the withdrawal of 5 MGD, on an annual daily average, of water from the canal. The MOA requires that the withdrawal amounts be regulated by the levels in the Lust Road Canal, the adjacent wetlands and the Lake Apopka level itself. The treated water will then be pumped into the City's reclaimed water distribution system to satisfy the projected irrigation demands.

The North Shore surface water treatment system will include the following:

- Canal water intake and withdrawal pump station

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- Pretreatment flow splitter box
- Constructed wetlands system
- Slow sand pond filtration
- Filtered water pump station
- Sodium hypochlorite feed system
- Miscellaneous other improvements

It is envisioned that the surface water treatment plant and the reclaimed water pump station will be constructed on the same site. The proposed location for these facilities is on the north shore of Lake Apopka south of Lust Road. The proposed site is on surplus land that is owned by the St. Johns River Water Management District.

Based on modeling performed for the update of the 2005 Reclaimed Water Master Plan Update, this pump station is projected to handle future peak reclaimed water demands of approximately 21,000 gpm.

This pump station could also be the receiving point for reclaimed water that is made available through Project RENEW (see description below). The City has received a grant through the St. Johns River Water Management District's Cost-Share Agreement Program to assist in the construction of the North Shore Project.

### *OUC Project RENEW*

It is understood that as part of the Orlando Utilities Commission (OUC) SJRWMD CUP, the City of Orlando and OUC are working together to develop and construct a reclaimed system in west Orange County. The City of Apopka and OUC executed an Agreement on March 5, 2009 by which OUC, together with the City of Orlando, will reroute wastewater effluent within the City's wastewater collection and treatment facilities so as to provide the City of Apopka with 3.0 million gallons per day (MGD) of reclaimed water by October 2013 and an additional 5.55 MGD of reclaimed water, for a total of 8.55 MGD, by October 2015. The Agreement provides the supply be provided in two installments. The City plans to accept the first installment of 3.00 mgd by the year 2014 with the remaining 5.55 mgd to be included by 2016.

### *City Stormwater Supplement*

The City Drainage Master Plan Update, prepared in April 2009, identifies stormwater collection projects which are expected to yield an annual daily average collection capacity of 0.497 mgd. The collected stormwater will be used to supplement the City's reclaimed water supplies.

## **Supply and Demand Analysis and Projections**

### **Demand Analysis and Projections**

The City of Apopka's system has experienced steady growth. Flow projections were developed as part of the City's consumptive use permitting process with the SJRWMD. System flow projections are based on a review of historical records and estimates of future needs. A brief description of each major factor is discussed below.

#### *Land Use*

For the purposes of a build-out scenario, the future land use maps were considered in developing the total demand that the system will need to provide.

#### *Population Growth and Demand Projections*

Population and water demand projections for the potable water system were developed by the City. They appear in Table 5A below in summary form and by year in Table 5B. The City is not planning to extend the potable water and/or wastewater systems into areas that are predominately served by private wells and/or septic tanks. If environmental concerns arise that could be alleviated by a central water and sewer system, then the City would be willing to consider participation in projects that would provide relief to such areas. Appendix B is a map that shows areas served by septic tanks within the City's water service area. The City currently provides water service to 2,932 customers who do not receive wastewater services from the City. These customers represent the number of estimated septic tanks contained within the septic tank areas shown in Appendix B. The City estimates that approximately 134 of their utility accounts are served potable water by a private well. The actual accounting for these private wells and septic tanks is performed by the Orange County Health Department who regulates their use. Table 5C shows the water demand projections for the reclaimed water system. Table 5D combines the two demands to show total projected demand for water resources.

#### *Future Potable Water Demand Growth Expectations*

The City recognizes that they will experience an estimated 0.159 MGD deficit of potable water supply in 2029 and an estimated 0.508 MGD deficit of potable water supply in 2030. As was discussed in the City's current Consumptive Use Permitting (CUP) process the City has been actively involved in the Seminole County Yankee Lake Project. The Yankee Lake Project is a cooperative effort on the part of Seminole County and several local utilities to withdraw water from the St. Johns River and deliver the water to the participating utilities. The utilities will then treat the water to meet their individual needs, that is, either as a potable water alternative water source or a reclaimed water alternative water source. The City is willing to participate in the Yankee Lake Project or other future alternative water supply projects identified by the District to satisfy the city's expected 2029 and 2030 potable water deficits.

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**Table 5A**  
**Population served by the Potable Water System and Potable Water Demands<sup>(1)</sup>**  
**City of Apopka**

| <b>Year</b> | <b>Projected Service Population</b> | <b>Projected Average Potable Water Demand (MGD)</b> |
|-------------|-------------------------------------|---|
| 2010        | 59,196                              | 10.925  |
| 2013        | 68,615                              | 12.114  |
| 2015        | 74,894                              | 12.912  |
| 2020        | 90,633                              | 14.542  |
| 2025        | 111,086                             | 16.607  |
| 2030        | 129,304                             | 18.279  |

(1) Source: Apopka CUP #3217 response to RAI # 6

**Table 5B  
Projected Potable Water Use  
City of Apopka  
(Revised June 8, 2010)**

| Year | Cumulative Population (Potable) | Projected Annual Population (Potable) | Percent of Projected Annual Population w/Reclaim | Projected Annual Population on Reclaim | Cumulative Population on Reclaim | Household size, persons | Number of Units with Reclaim | Per Capita Potable Usage (gpcd) | Per Capita Potable Usage w/o Reclaim | Percentage Potable Usage w/o Reclaim | Potable Per Capita Usage (gpcd) | Percentage Potable Usage with Reclaim | Per Capita Combined Usage (gpcd) | Household Avg. Day (mgd) | Household Max. Day (mgd) | Commercial Industrial Avg. Day (mgd) | Commercial Industrial Max. Day (mgd) | Irrigation Urban Landscape or Common Areas Avg. Day (mgd) | Irrigation Urban Landscape or Common Areas Max. Day (mgd) | Water Utility (mgd) | Unaccounted for Water (mgd) | Zellwood Station | Total Annual Avg. Day (mgd) | Total Annual Max. Day (mgd) |
|------|---------------------------------|---------------------------------------|--|--|----------------------------------|-------------------------|------------------------------|---------------------------------|--------------------------------------|--------------------------------------|---------------------------------|---------------------------------------|----------------------------------|--------------------------|--------------------------|--------------------------------------|--------------------------------------|---|---|---------------------|-----------------------------|------------------|-----------------------------|-----------------------------|
| 2010 | 59,196                          | 3,140                                 | 75%  | 2,355                                  | 15,532                           | 2.80                    | 5,547                        | 162                             | 74%                                  | 74%                                  | 75                              | 26%                                   | 139                              | 8.23                     | 20,575                   | 1,312                                | 3,280                                | 0.082   | 0.205   | 0.160               | 0.721                       | 0.420            | 10,925                      | 27,313                      |
| 2011 | 62,335                          | 3,139                                 | 75%  | 2,354                                  | 17,886                           | 2.80                    | 6,388                        | 162                             | 71%                                  | 71%                                  | 75                              | 29%                                   | 137                              | 8.54                     | 21,350                   | 1,361                                | 3,403                                | 0.085   | 0.213   | 0.166               | 0.748                       | 0.433            | 11,333                      | 28,333                      |
| 2012 | 65,475                          | 3,140                                 | 75%  | 2,355                                  | 20,241                           | 2.80                    | 7,229                        | 162                             | 69%                                  | 69%                                  | 75                              | 31%                                   | 135                              | 8.84                     | 22,100                   | 1,409                                | 3,523                                | 0.088   | 0.220   | 0.171               | 0.775                       | 0.447            | 11,730                      | 29,325                      |
| 2013 | 68,615                          | 3,140                                 | 75%  | 2,355                                  | 22,596                           | 2.80                    | 8,070                        | 162                             | 67%                                  | 67%                                  | 75                              | 33%                                   | 133                              | 9.13                     | 22,825                   | 1,455                                | 3,638                                | 0.091   | 0.228   | 0.177               | 0.800                       | 0.461            | 12,114                      | 30,285                      |
| 2014 | 71,755                          | 3,140                                 | 75%  | 2,355                                  | 24,951                           | 2.80                    | 8,911                        | 162                             | 65%                                  | 65%                                  | 75                              | 35%                                   | 132                              | 9.47                     | 23,675                   | 1,510                                | 3,775                                | 0.095   | 0.238   | 0.184               | 0.830                       | 0.475            | 12,564                      | 31,410                      |
| 2015 | 74,894                          | 3,139                                 | 75%  | 2,354                                  | 27,305                           | 2.80                    | 9,752                        | 162                             | 64%                                  | 64%                                  | 74                              | 36%                                   | 130                              | 9.74                     | 24,350                   | 1,553                                | 3,883                                | 0.097   | 0.243   | 0.189               | 0.853                       | 0.480            | 12,912                      | 32,280                      |
| 2016 | 78,042                          | 3,148                                 | 76%  | 2,392                                  | 29,697                           | 2.80                    | 10,606                       | 162                             | 62%                                  | 62%                                  | 73                              | 38%                                   | 128                              | 9.99                     | 24,975                   | 1,592                                | 3,980                                | 0.100   | 0.250   | 0.194               | 0.875                       | 0.500            | 13,251                      | 33,128                      |
| 2017 | 81,190                          | 3,148                                 | 77%  | 2,424                                  | 32,121                           | 2.80                    | 11,472                       | 162                             | 61%                                  | 61%                                  | 72                              | 39%                                   | 127                              | 10.31                    | 25,775                   | 1,643                                | 4,108                                | 0.103   | 0.258   | 0.200               | 0.902                       | 0.509            | 13,667                      | 34,168                      |
| 2018 | 84,336                          | 3,148                                 | 78%  | 2,455                                  | 34,576                           | 2.80                    | 12,349                       | 162                             | 59%                                  | 59%                                  | 71                              | 41%                                   | 125                              | 10.54                    | 26,350                   | 1,680                                | 4,200                                | 0.105   | 0.263   | 0.204               | 0.922                       | 0.519            | 13,970                      | 34,925                      |
| 2019 | 87,485                          | 3,147                                 | 79%  | 2,486                                  | 37,062                           | 2.80                    | 13,236                       | 162                             | 58%                                  | 58%                                  | 70                              | 42%                                   | 123                              | 10.76                    | 26,900                   | 1,715                                | 4,288                                | 0.108   | 0.270   | 0.209               | 0.942                       | 0.529            | 14,263                      | 35,658                      |
| 2020 | 90,633                          | 3,148                                 | 80%  | 2,518                                  | 39,580                           | 2.80                    | 14,136                       | 162                             | 56%                                  | 56%                                  | 69                              | 44%                                   | 121                              | 10.97                    | 27,425                   | 1,749                                | 4,373                                | 0.110   | 0.275   | 0.213               | 0.960                       | 0.540            | 14,542                      | 36,355                      |
| 2021 | 94,724                          | 4,090                                 | 82%  | 3,354                                  | 42,934                           | 2.80                    | 15,334                       | 162                             | 55%                                  | 55%                                  | 68                              | 45%                                   | 120                              | 11.37                    | 28,425                   | 1,812                                | 4,530                                | 0.114   | 0.285   | 0.221               | 0.994                       | 0.549            | 15,060                      | 37,650                      |
| 2022 | 98,814                          | 4,091                                 | 84%  | 3,436                                  | 46,370                           | 2.80                    | 16,561                       | 162                             | 53%                                  | 53%                                  | 67                              | 47%                                   | 117                              | 11.56                    | 28,900                   | 1,843                                | 4,608                                | 0.116   | 0.290   | 0.224               | 1.011                       | 0.560            | 15,314                      | 38,285                      |
| 2023 | 102,905                         | 4,091                                 | 86%  | 3,518                                  | 49,888                           | 2.80                    | 17,817                       | 162                             | 51%                                  | 51%                                  | 66                              | 49%                                   | 115                              | 11.83                    | 29,575                   | 1,886                                | 4,715                                | 0.118   | 0.295   | 0.230               | 1.035                       | 0.570            | 15,669                      | 39,173                      |
| 2024 | 106,995                         | 4,091                                 | 88%  | 3,600                                  | 53,488                           | 2.80                    | 19,103                       | 162                             | 50%                                  | 50%                                  | 66                              | 50%                                   | 114                              | 12.2                     | 30,500                   | 1,945                                | 4,863                                | 0.122   | 0.305   | 0.237               | 1.066                       | 0.580            | 16,150                      | 40,375                      |
| 2025 | 111,086                         | 4,091                                 | 90%  | 3,682                                  | 57,170                           | 2.80                    | 20,418                       | 162                             | 49%                                  | 49%                                  | 65                              | 51%                                   | 113                              | 12.55                    | 31,375                   | 2,001                                | 5,003                                | 0.126   | 0.315   | 0.243               | 1.097                       | 0.590            | 16,607                      | 41,518                      |
| 2026 | 114,730                         | 3,644                                 | 90%  | 3,280                                  | 60,450                           | 2.80                    | 21,589                       | 162                             | 48%                                  | 48%                                  | 65                              | 52%                                   | 112                              | 12.85                    | 32,125                   | 2,048                                | 5,120                                | 0.129   | 0.323   | 0.249               | 1.122                       | 0.596            | 16,994                      | 42,485                      |
| 2027 | 118,373                         | 3,644                                 | 90%  | 3,280                                  | 63,730                           | 2.80                    | 22,761                       | 162                             | 47%                                  | 47%                                  | 65                              | 53%                                   | 111                              | 13.14                    | 32,850                   | 2,095                                | 5,238                                | 0.131   | 0.328   | 0.255               | 1.147                       | 0.602            | 17,370                      | 43,425                      |
| 2028 | 122,017                         | 3,644                                 | 90%  | 3,280                                  | 67,010                           | 2.80                    | 23,932                       | 162                             | 45%                                  | 45%                                  | 65                              | 55%                                   | 109                              | 13.3                     | 33,250                   | 2,120                                | 5,300                                | 0.133   | 0.333   | 0.258               | 1.161                       | 0.608            | 17,800                      | 43,950                      |
| 2029 | 125,660                         | 3,643                                 | 90%  | 3,279                                  | 70,289                           | 2.80                    | 25,103                       | 162                             | 44%                                  | 44%                                  | 65                              | 56%                                   | 108                              | 13.57                    | 33,925                   | 2,163                                | 5,408                                | 0.136   | 0.340   | 0.263               | 1.184                       | 0.614            | 17,930                      | 44,825                      |
| 2030 | 129,304                         | 3,643                                 | 90%  | 3,279                                  | 73,568                           | 2.80                    | 26,274                       | 162                             | 43%                                  | 43%                                  | 65                              | 57%                                   | 107                              | 13.84                    | 34,600                   | 2,206                                | 5,515                                | 0.138   | 0.345   | 0.268               | 1.207                       | 0.620            | 18,279                      | 45,698                      |

City of Apopka Water Supply Facilities Work Plan

**Table 5C**  
**Reclaimed Water System Demands<sup>(1)</sup>**  
**City of Apopka**

| <b>Year</b> | <b>Projected Service Population</b> | <b>Projected Average Daily Residential Demand (MGD)</b> | <b>Projected Average Daily Commercial &amp; Other Demands (MGD)</b> | <b>Projected Total Average Daily Reclaimed Water Demand (MGD)</b> |
|-------------|-------------------------------------|---|---|---|
| 2010        | 15,532                              | 3.899   | 4.112   | 8.011   |
| 2013        | 22,596                              | 4.949   | 4.479   | 9.428   |
| 2015        | 27,308                              | 5.406   | 4.664   | 10.070  |
| 2020        | 39,580                              | 7.006   | 5.575   | 12.581  |
| 2025        | 57,170                              | 10.119  | 6.920   | 17.039  |
| 2030        | 73,568                              | 13.022  | 8.226   | 21.248  |

<sup>(1)</sup> Source: City of Apopka CUP #3217 response to RAI # 6

**Table 5D**  
**Total Projected Average Daily Demand for Water Resources**  
**City of Apopka**

| <b>Year</b> | <b>Projected Potable Water Demand (MGD)</b> | <b>Projected Reclaimed Water Demand (MGD)</b> | <b>Total Water Resources Demand (MGD)</b> |
|-------------|---|---|---|
| 2010        | 10.925                                      | 8.011   | 18.936                                    |
| 2013        | 12.114                                      | 9.428   | 21.542                                    |
| 2015        | 12.912                                      | 10.070  | 22.982                                    |
| 2020        | 14.542                                      | 12.581  | 27.123                                    |
| 2025        | 16.607                                      | 17.039  | 33.646                                    |
| 2030        | 18.279                                      | 21.248  | 39.527                                    |

## City of Apopka Water Supply Facilities Work Plan

### Supply Analysis

It is projected that the Floridan Aquifer will supply about 15.788 mgd in 2010, 17.771 mgd in 2013, and 18.279 mgd in 2030. The projected potable water use for the City is shown in Table 5B. As shown in Table 5B, the City plans to meet its potable water demand in part by aggressively lowering the per capita use in the future. This will be accomplished by a steady increase in the reclaimed water use within new developments in the City. The reclaimed water system will be augmented by projects previously listed above.

As shown in Table 5C, the reclaimed water demand for the City is expected to increase over the next 10 years.

The projected total water demand for the City is shown above in Table 5D on the previous page.

### District Water Supply Plans

The St Johns River Water Management District has been actively researching water supply options within district borders. Initially the District Water Supply Plan (DWSP) was developed as of May 2000, but an updated draft was issued in August 2005. Following a series of public hearing, the Plan was adopted in 2006. A fourth addendum to the plan was dated May 12, 2009. It serves as a roadmap for the District and sets the direction for the district's strategic plans, fiscal plans, and other planning efforts. It also serves as a source of information for local governments and others seeking technical information regarding water resource issues.

In previous version of the DWSP, for the East-Central Florida Area the District has been focusing on a Planning Initiative (Initiative). In November 2002 the East-Central Florida Water Agenda Issue Areas, Recommendations and Strategies was published (Phase I). Issue areas addressed were to develop new water supply, optimize the use of reclaimed water, enhance aquifer recharge using reclaimed water, increase water conservation, link land use and water supply planning, and enhance intergovernmental coordination. For 2003, the District developed the East-Central Florida Water Supply Planning Initiative Phase II Annual Report of Activities and Accomplishments. Phase II Initiative activities during 2003 included efforts in each of the six issue areas identified in Phase I.

However, in the fourth addendum version of the DWSP, the following potential alternative water supply projects were identified for the City of Apopka .

- St Johns River (Yankee Lake)
- Lake Apopka Reuse Augmentation
- Orlando Utilities Commission (OUC) – Project RENEW

The City advised the District on November 13, 2009 that the City's revised list of alternative water supply projects would consist of the OUC Project RENEW, North Shore Restoration Area (fka: Lake Apopka Reuse Augmentation) and the City Stormwater Supplement.

## City of Apopka Water Supply Facilities Work Plan

With partial funding from the SJRWMD, the City of Apopka studied the feasibility of using Lake Apopka as a source of supplemental water for the City's reclaimed water system. The report titled "Lake Apopka Reclaimed Water Supplement Final Technical Report" was published in May 2006. On December 9, 2008 the SJRWMD issued CUP No. 102497 to the City of Apopka authorizing the withdrawal of 5.0 mgd average annual daily of surface water withdrawal from the Lake Apopka North Shore Restoration Area for reclaimed water augmentation through the year 2028. The estimated capital costs for the project are reported at \$8.79 million with an estimated unit cost of \$1.99/1000 gal.

Lake Apopka water does not meet unrestricted access reclaimed water standards for total suspended solids, pH, and turbidity. Also, disinfection is necessary before using the water for unrestricted access irrigation with a minimum chlorine residual of 1.0 mg/L. Therefore, treatment is necessary before using the water as a supplemental reclaimed water supply source. It was envisioned that surface water from the Lake Apopka system would be developed in up to three phases. The Phase 1 average daily flow capacity will be 5.0 mgd. Phases 2 and 3 were envisioned to include an average daily withdrawal of 5.0 mgd and 4.0 mgd, respectively. Phases 2 and 3 will likely rely on the development of reservoirs along the lake shore where excess water may be diverted and stored.

The May 2006 Report includes the following components:

- Establishing existing and future reclaimed water demands
- Establishing need for supplemental reclaimed water supply
- Brief review of alternative sources of supplemental reclaimed water
- Review of existing and future regulatory requirements/constraints and other pertinent information
- Lake Apopka source water characterization
- Establishing size of the project, setting treatment goals, and recognizing treatment issues
- Conceptual designs of common treatment unit processes in three (3) alternatives
- Conceptual designs of three (3) alternative systems
- Developing capital and O&M costs of alternatives
- Present Worth Analysis and alternatives comparison

## City of Apopka Water Supply Facilities Work Plan

Three (3) alternative treatment systems were evaluated in the May 2006 Report:

1. Natural Treatment System (NTS) - Constructed wetlands treatment system followed by slow sand pond filter using naturally available soils. The NTS will be similar to that currently employed by SJRWMD on the northwest shore of Lake Apopka called the “Marsh Flow-Way”.
2. Algae Harvesting System (AHS) – This is a proprietary system from Aqua Fiber Technologies, Winter Park, Florida using Periphyton (algae) Flow-Ways followed by a Diatomaceous Earth (DE) filter.
3. Chemical Treatment System (CTS) - Actiflo<sup>®</sup> physical-chemical treatment system using alum or ferric sulfate coagulation/flocculation/sedimentation followed by slow sand pond filtration using naturally available soil.

The present worth values for Phase I (5.0 mgd) were calculated using a 7.0 percent interest rate and a 30-year project life. Alternative 1 (Natural Treatment System) had a present worth cost \$1.22 per 1,000 gallons. It was the least expensive treatment option and will potentially produce water that has a color similar to the City’s WRF effluent (reclaimed water). Alternative 3 (Chemical Treatment System) had a present worth cost of \$1.75 per 1,000 gallons. The water produced from Alternative 3 would be high quality with color meeting secondary drinking water standards. The present worth cost for Alternative 2 (Algae Harvesting System) was \$1.79 per 1,000 gallons, which was the highest among the evaluated alternatives. The water quality produced by Alternative 2 would be comparable with Alternative 3’s water quality.

Based on Present Worth Analysis, Alternative 1 – Natural Treatment System is the least expensive alternative. A pilot study of the selected alternative is recommended before commencing the final design to validate system performance.

### **Conservation**

The City of Apopka employs a number of water conservations measures. Through the City’s water conservation ordinance (No. 2107) for landscape irrigation, water conservation restrictions have been established for both potable and reclaimed water users. The ordinance includes the following provisions:

- ❑ Landscape irrigation is restricted to a maximum of two days per week. No irrigation is allowed between the hours of 10 a.m. and 4 p.m. during daylight savings time.
- ❑ During Eastern Standard Time customers not using reclaimed water for irrigation may irrigate their landscape only one day per week. Reclaimed water customers may irrigate two days per week in accordance with District rules.
- ❑ Addresses ending with an odd number must only irrigate on Wednesday and Saturday.
- ❑ Addresses ending with an even number must only irrigate on Thursday and Sunday.

A violation of the irrigation restrictions results in a \$50 dollar fine after the first offense. Subsequent violations result in even higher fines. After 4 offenses, the fine is \$500 for each subsequent violation.

## City of Apopka Water Supply Facilities Work Plan

In May 2008, the City amended its Landscape Ordinance (2069) to include water-wise irrigation practices and the application of Florida friendly landscape practices. Among the features of this ordinance are the following:

- Restricts high volume irrigation (>5 gpm/spray head) to 50% of the landscaped area or one-half acre whichever is smaller for residential properties.
- Restricts medium volume irrigation (0.5 to 5 gpm/spray head) to 25 percent of the landscaped area. The irrigation area can be increased to 75 percent if no high volume irrigation is present.
- Allows 100 percent coverage for low volume (< 0.33 gpm/emitter) systems. The minimum coverage is 25 percent of the landscaped area.
- Restricts use of low drought tolerance turf grass to 50 percent of the green space area or one-half acre, whichever is smaller.
- Does not limit the use of drought tolerant turf like bahia grass.
- Provides for financial incentives to encourage home owners to upgrade their irrigation systems to conserve water.

The City's rate structures for both potable water and reclaimed water are increasing block rates. The rate structures are designed to encourage wise use of water.

The City provides water conservation education to the public through the city website, utility billing mailings, newspaper articles, brochures, flyers, door hangers, and high user letters with tips on conserving water and proper irrigation maintenance. The city also provides speakers, displays, handouts, and activities for school events, City events, Home Owner Associations, builders, and to any group or individual that requests the information. The City is planning to purchase water conservation kits to use as an education tool at schools and other city events.

The City provides financial incentives through the Water Conservation Incentive Program to encourage homeowners and businesses to upgrade and retrofit their irrigation systems to become more efficient and water conserving. The program provides credits for installing water-conserving devices such as low-volume irrigation and "smart" controllers. The City also offers customers with a free irrigation evaluation, as well as provides rain sensors to those without a functioning sensor.

All new development projects within the City of Apopka are required to have a dual water system. Water for indoor uses and fire protection is provided by the potable water system. Water for outdoor uses is provided by the reclaimed water system.

The City of Apopka is planning on the positive benefits of water conservation. The Comprehensive Plan's Infrastructure Element Policy 2.1.2 calls for the City to lower its level of service from 177 gpcd in 2020 to 166 gpcd by January 1, 2015 and to further reduce it to 154 gpcd by 2020, 144 gpcd in 2025 and 137 gpcd in 2030. The City will commit to meeting the revised per unit demand for potable water as shown in Table 5B. The City estimates a water use rate of 159 gpcd for the year 2018, which incorporates commercial flows and unaccounted for water based on the flow projections and the projected number of residential units (City of Apopka CUP #3217 RAI #6 response).

## City of Apopka Water Supply Facilities Work Plan

Particular information concerning conservation, such as implementing District water restrictions and enforcement of same, public education, special rates, residential meter change out, address unaccounted for water, and reuse are discussed in the SJRWMD CUP permit renewal and not repeated here.

### **Water Supply Strategy**

The City will adopt a policy in the Infrastructure Element of the Comprehensive Plan to ensure that the impacts of comprehensive plan amendments upon groundwater supply are assessed. . The issues to be addressed in the analysis include: Infrastructure Information, SJRWMD CUP Information, reserved capacity for the proposed amendment, and a Consumptive Use Analysis. Projected sources and flows for the potable water and reclaimed water systems are shown in Tables 6 and 7, respectively.

The City recognizes the shortfall of groundwater to supply future water demand and has been participating in the implementation phase of the District's East-Central Water Supply Planning Initiative in order to find regional solutions for potential water supply problems. This will include the development of alternative water sources to supplement the groundwater supply. Total well capacity after the purchase of the Orange County facilities was 33.7 mgd.

The City's existing SJRWMD CUP permits the use of groundwater to augment the City's reclaimed water distribution system. The City is currently planning on three projects to augment the City's reclaimed water supply, including OUC's Project Renew; North Shore surface water and the collection of stormwater into lined ponds. As these projects' resources become available, the City plans to divert the groundwater previously used for reclaimed water augmentation to satisfy the City's potable groundwater needs.

The City is working with the SJRWMD on a conjunctive water use approach involving groundwater and other sources of augmentation water such as the North Shore. In the event the augmentation sources are limited in supply, the City would use groundwater to make up the difference.

City of Apopka Water Supply Facilities Work Plan

**Table 6  
Projected Potable Water Supply Sources and Flows  
City of Apopka**

| Year | Average Daily Flows      |  |                             | Maximum Daily Flows      |  |                             |
|------|--------------------------|--|-----------------------------|--------------------------|--|-----------------------------|
|      | Projected Flow ADF (MGD) | Existing Floridan Aquifer Supply (MGD) | Other Supplies Needed (MGD) | Projected Flow MDF (MGD) | Existing Floridan Aquifer Supply (MGD) | Other Supplies Needed (MGD) |
| 2010 | 10.925                   | 33.7                                   | 0                           | 27.313                   | 33.7                                   | 0                           |
| 2013 | 12.114                   | 33.7                                   | 0                           | 30.285                   | 33.7                                   | 0                           |
| 2015 | 12.912                   | 38.74                                  | 0                           | 32.280                   | 38.74                                  | 0                           |
| 2020 | 14.542                   | 38.74                                  | 0                           | 36.355                   | 38.74                                  | 0                           |
| 2025 | 16.607                   | 48.82                                  | 0                           | 41.518                   | 48.82                                  | 0                           |
| 2030 | 18.279                   | 48.82                                  | 0                           | 45.698                   | 48.82                                  | 0                           |

**Table 7  
Projected Reclaimed Water Supply Sources and Flows  
City of Apopka**

| Year | Average Daily Flows                 |                              |   |                            |  |
|------|-------------------------------------|------------------------------|---|----------------------------|--|
|      | Projected Reclaimed Water Use (MGD) | Projected WRF Flow ADF (MGD) | Projected Average Daily Flow from Neighboring Utilities (MGD) | North Shore Supplies (MGD) | Projected Average Daily Flow from Groundwater Augmentation (MGD) |
| 2010 | 8.011                               | 3.148                        | 0   | 0                          | 4.863  |
| 2013 | 9.428                               | 3.771                        | 0   | 0                          | 5.657  |
| 2015 | 10.070                              | 4.184                        | 3.00  | 5.00                       | 0.00   |
| 2020 | 12.581                              | 4.903                        | 8.55  | 5.00                       | 0.00   |
| 2025 | 17.039                              | 6.227                        | 8.55  | 5.00                       | 0.00   |
| 2030 | 21.248                              | 7.405                        | 8.55  | 5.00                       | 0.00   |

# City of Apopka Water Supply Facilities Work Plan

## FACILITY ANALYSIS

### Ten-Year Work Plan 2020

The City of Apopka WTPs have maximum treatment capacity (well capacity) of 33.7 mgd, which will potentially serve AADF demands beyond 2016. Additional capacity upgrades to transmission distribution, and storage facilities will be occurring during the next 10 years. Refer to Appendix C for a listing of the various proposed projects.

Presently the City plans to construct the Southwest WTP in the year 2016 consisting of 1 well rated at 3,500 gpm, 2 high service pumps each rated at 3,500 gpm, one ground storage tank sized at 1.5 million gallons. As required by the City's Comprehensive Plan, these wells will be drilled into the Lower Floridan Aquifer. However in the latest 2005 Potable Water Master Plan Update that will eventually be incorporated into the Comprehensive plan, this proposed WTP would have the following elements by 2030:

|                                | <u>2016</u> | <u>2021</u> | <u>2030</u> |
|--------------------------------|-------------|-------------|-------------|
| HSPs, rated at 3,500 gpm each  | <u>2</u>    | <u>3</u>    | <u>3</u>    |
| Wells, rated at 3,500 gpm each | <u>1</u>    | <u>2</u>    | <u>2</u>    |
| GSTs, rated at 1.5 mgd each    | 1           | 1           | 2           |

Every five (5) years, the City plans to update its Work Plan in conjunction with the preparation of CUP Compliance Reports in order to verify that the water sources and facilities are capable of supplying the needs of Apopka.

In order to provide capacity, the City has established a **Ten-Year Schedule of Capital Improvement**, which is included in Appendix C and Appendix D. A more detailed description of these projects can be found in the City's Capital Improvement Element. The schedule of improvements will enable the City to address projected flows from existing and proposed sources. The City has secured funding for these projects through the use of impact fees, renewal and replacement funds, and other revenue sources. The City has used other funding means in the past such as municipal loans and bonds to finance projects. Developers are required by City policy to extend their utility mains up to one mile to connect to the City's utility services. Due to the recent downturn in economic development the planned utility improvements identified in the City's 2005 Water Master Plan, 2005 Wastewater Master Plan and 2005 Reclaimed Water Master Plan scheduled to take place by 2015 have been moved to 2020 in this Work Plan. The Utility Master Plan updates scheduled for 2012 will further describe the City's needed future utility improvements.

## **REVISED COMPREHENSIVE PLAN ELEMENTS**

After assessing the current Comprehensive Plan, the City feels that only these elements need to be amended to implement the Water Supply Facilities Work Plan. Below is an analysis of the pertinent elements to the Comprehensive Plan.

### *Capital Improvements:*

The background document will be updated to reflect at least a five-year schedule of capital improvements.

### *Intergovernmental Coordination:*

Policies in the Intergovernmental Coordination Element will be revised to establish a relationship between the Water Supply Facilities Work Plan, District Water Supply Plan (SJRWMD 2000), the District's water supply assessments, Consumptive Use Permit process, East Central Florida Water Supply Planning Initiative, East Central Florida Regional Planning Council, District Staff, and Orange County.

Policies will be added to the Intergovernmental Coordination Element to address the following:

- Supply and demand projections will be consistent with the plans noted above.
- The City will actively participate in water supply planning work groups and meetings on an as-needed basis.

### *Infrastructure Element*

The most recent minimum level of service (LOS) standards for water were effective on November 4, 2004 and need to be brought up-to-date to reflect the commitment to a reduction in the demand in terms of gallons per capita per day (gpcd).

### *Potable Water Sub-Element*

Two modified and two additional objectives and associated policies were added to the Potable Water Sub-Element to address the Water Supply Facilities Work Plan.

- Maintain a Water Supply Facilities Work Plan that covers a minimum ten-year planning period. The associated policies require continuous updates to the Water Supply Facilities Work Plan including consistency with LOS standards State and Regional plans, a plan to seek alternative sources of water, demand projections, capital improvement schedule and the provision of facilities to withdraw, transmit treat, store and distribute potable water.

## City of Apopka Water Supply Facilities Work Plan

- Identify and use water supply sources that are consistent with the Water Supply Facilities Work Plan. The associated policies will direct the City to develop feasible water sources and avoid adverse impacts to the environment. The policies will also require the City to maximize the use of alternative water supplies and implement management techniques in order to sustain water resources and enhance existing supplies.

### *Conservation*

As necessary, the background documents of the conservation element will be revised to update the projected water demands and sources identified in the Water Supply Facilities Work Plan.

## City of Apopka Water Supply Facilities Work Plan

### **CHAPTER EXHIBITS AND MAPS**

For the following exhibits and maps related to this Work Plan, refer to the 2005 Potable Water Master Plan Update and Reclaimed Water Master Plan.

- Water Collection and Treatment Facilities
- Major Water Distribution Mains and Storage Facilities
- Reclaimed Water Distribution System
- Water Service Area Existing and 20 year Projection
- Water Distribution System Inventory

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# **APPENDIX A**

## **SJRWMD CONFIRMATION LETTER**

City of Apopka Water Supply Facilities Work Plan

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## City of Apopka Water Supply Facilities Work Plan

**APPENDIX A: SJRWMD Confirmation Letter (The SJRWMD approval letter is then inserted into this Appendix)**

# City of Apopka Water Supply Facilities Work Plan

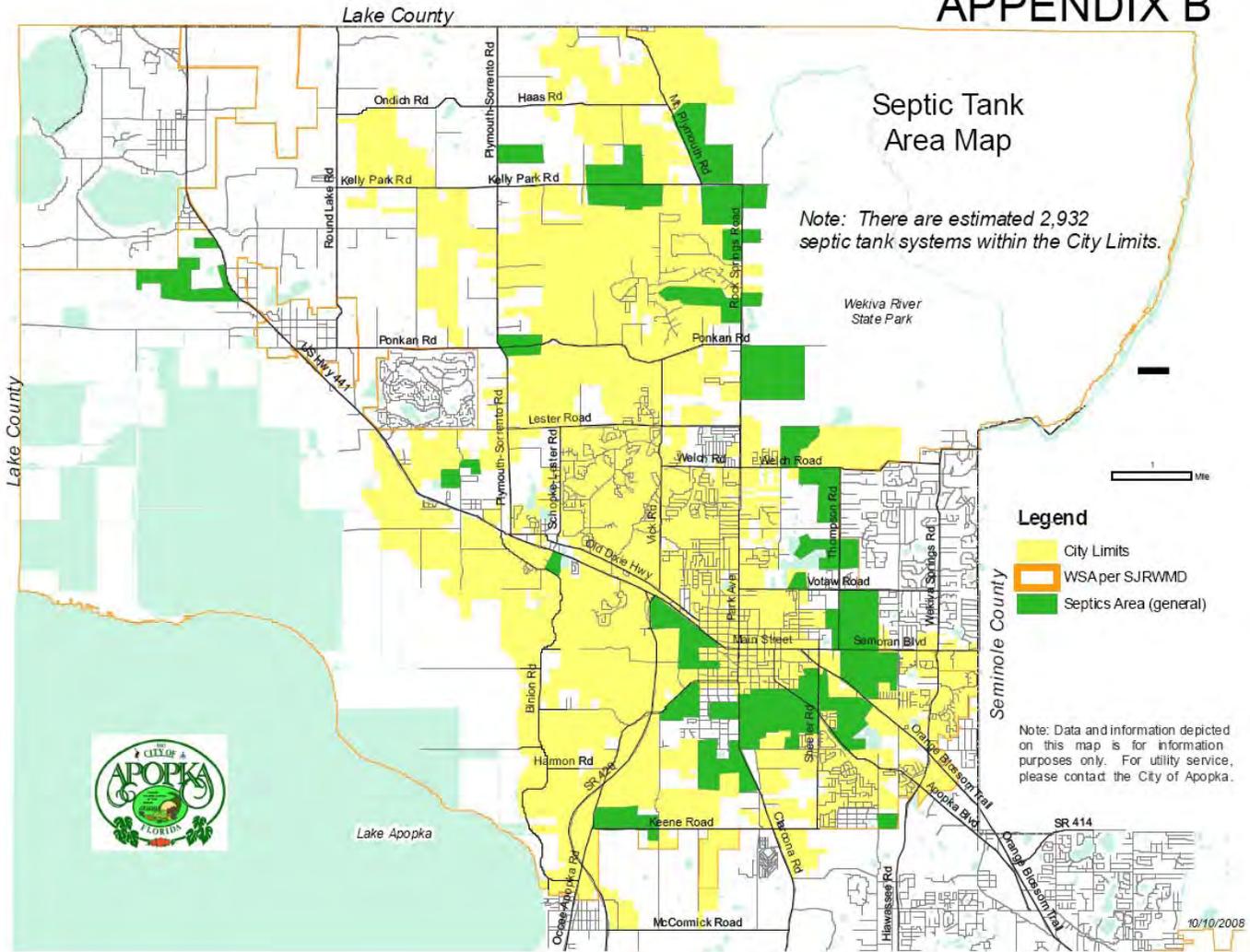
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**APPENDIX B**  
**SEPTIC TANK AREA MAP**

City of Apopka Water Supply Facilities Work Plan

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APPENDIX B



# City of Apopka Water Supply Facilities Work Plan

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**APPENDIX C**  
**TEN YEAR WORK PLAN**

# City of Apopka Water Supply Facilities Work Plan

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City of Apopka Water Supply Facilities Work Plan

**APPENDIX C: Ten-Year Work Plan**

**Table C-1  
2020 Summary of Facilities – Water Treatment Plants  
(Source: Table 6-1 of 2005 Potable Water Master Plan Update)\*\***

| <b>Plant</b>      | <b>Rated Well Pump Capacity (gpm)</b> | <b>Well Casing Size (inches)</b> | <b>High Service Pumps (gpm)</b> | <b>Total High Service Pumping Capacity (gpm)</b> | <b>Type of Storage</b> | <b>Storage Capacity (MG)</b> | <b>Treatment</b>        |  |
|-------------------|---------------------------------------|----------------------------------|---------------------------------|--|------------------------|------------------------------|-------------------------|--|
| Myrtle Rogers     | 3,500                                 | 24                               | 2,500                           | 8,000  | Ground                 | 1.0                          | Aeration & Chlorination |  |
| Womble            | 3,500                                 | 24                               | 2,500<br>3,000                  |  | Ground                 | 1.0                          |                         |  |
| Grossenbacher     | 1,000                                 | 12                               | 2,400                           | 12,900   | Ground                 | 0.5                          | Aeration & Chlorination |  |
|                   | 3,500                                 | 20                               | 3,500                           |  | Ground                 | 1.0                          | Aeration & Chlorination |  |
|                   | 3,500                                 | 20                               | 3,500                           |  | 3,500                  |                              |                         |  |
| Sheeler Oaks      | 2,500                                 | 18                               | 1,950                           | 6,650  | Ground                 | 1.0                          | Aeration & Chlorination |  |
|                   | 2,500                                 | 18                               | 1,950                           |  | Ground                 | 0.5                          | Aeration & Chlorination |  |
|                   |                                       |                                  | 1,500                           |  |                        |                              |                         |  |
|                   |                                       |                                  | 1,250                           |  |                        |                              |                         |  |
| Plymouth Regional | 400                                   | 8                                | 2,200                           | 6,200  | Ground                 | 0.75                         | Chlorination            |  |
|                   | 500                                   | 14                               | 1,800                           |  | Ground                 | 1.0                          | Aeration & Chlorination |  |
|                   | 500                                   | 14                               | 1,800                           |  |                        |                              |                         |  |
|                   | 3,500                                 | 18                               | 400                             |  |                        |                              |                         |  |
| Mount Plymouth    | 1,000                                 | 12                               | 1,000                           | 3,580  | Ground                 | 0.5                          | Aeration & Chlorination |  |
|                   | 1,000                                 | 10                               | 1,000                           |  |                        |                              |                         |  |
|                   |                                       |                                  | 1,000                           |  |                        |                              |                         |  |
| Southwest         | 3,500                                 | 20                               | 3,500                           | 7,000  | Ground                 | 1.5                          | Aeration & Chlorination |  |
|                   |                                       | 20                               | 3,500                           |  |                        |                              |                         |  |
| <b>Total</b>      | 30,400                                |                                  |                                 | 44,330*  |                        | 8.75                         |                         |  |

\*Since all of the plants are interconnected, the system firm capacity is the total capacity less the capacity of the largest high service pump or 40,830 gpm.

\*\* Potable Water Master Plan to be updated in 2012.

City of Apopka Water Supply Facilities Work Plan

**Table C-2  
2030 Summary of Facilities – Water Treatment Plants  
(Source: Table 6-2 of 2005 Potable Water Master Plan Update)\*\***

| Plant             | Rated Well Pump Capacity (gpm) | Well Casing Size (inches) | High Service Pumps (gpm) | Total High Service Pumping Capacity (gpm) | Type of Storage | Storage Capacity (MG) | Treatment               |
|-------------------|--------------------------------|---------------------------|--------------------------|---|-----------------|-----------------------|-------------------------|
| Myrtle Rogers     | 3,500                          | 24                        | 2,500                    | 11,000                                    | Ground          | 1.0                   | Aeration & Chlorination |
|                   | 3,500                          | 24                        | 2,500                    |   |                 |                       |                         |
| Womble            |                                |                           | 3,000                    | 16,400                                    | Ground          | 1.0                   | Aeration & Chlorination |
|                   |                                |                           | 3,000                    |   |                 |                       |                         |
|                   | 1,000                          | 12                        | 2,400                    |   |                 |                       |                         |
|                   | 3,500                          | 20                        | 3,500                    |   |                 |                       |                         |
|                   | 3,500                          | 20                        | 3,500                    |   |                 |                       |                         |
| Grossenbacher     |                                |                           | 3,500                    | 6,650                                     | Ground          | 0.5                   | Aeration & Chlorination |
|                   |                                |                           | 3,500                    |   |                 |                       |                         |
|                   |                                |                           | 3,500                    |   |                 |                       |                         |
|                   |                                |                           | 3,500                    |   |                 |                       |                         |
| Sheeler Oaks      | 2,500                          | 18                        | 1,950                    | 6,650                                     | Ground          | 1.0                   | Aeration & Chlorination |
|                   | 2,500                          | 18                        | 1,950                    |   |                 |                       |                         |
|                   |                                |                           | 1,500                    |   |                 |                       |                         |
| Plymouth Regional |                                |                           | 1,250                    | 6,200                                     | Ground          | 0.75                  | Chlorination            |
|                   | 400                            | 8                         | 2,200                    |   |                 |                       |                         |
|                   | 500                            | 14                        | 1,800                    |   |                 |                       |                         |
|                   | 500                            | 14                        | 1,800                    |   |                 |                       |                         |
| Mount Plymouth    | 3,500                          | 18                        | 400                      | 3,580                                     | Ground          | 0.5                   | Aeration & Chlorination |
|                   | 1,000                          | 12                        | 1,000                    |   |                 |                       |                         |
|                   | 1,000                          | 10                        | 1,000                    |   |                 |                       |                         |
|                   |                                |                           | 580                      |   |                 |                       |                         |
| Southwest         | 3,500                          | 20                        | 3,500                    | 10,500                                    | Ground          | 1.5                   | Aeration & Chlorination |
|                   | 3,500                          | 20                        | 3,500                    |   |                 |                       |                         |
|                   |                                |                           | 3,500                    |   | Ground          | 1.5                   |                         |
| <b>Total</b>      | <b>33,900</b>                  |                           |                          | <b>54,330</b>                             |                 | <b>11.25</b>          |                         |

\*Since all of the plants are interconnected, the system firm capacity is the total capacity less the capacity of the largest high service pump or 50,830 gpm

\*\* Potable Water Master Plan to be updated in 2012.

City of Apopka Water Supply Facilities Work Plan

**Table C-3**  
**2010 2020 Summary of Facilities – Reclaimed Water Pump Stations**  
**(Source: Table 7-1 of 2005 Reclaimed Water Master Plan Update)\***

| <b>Pump Station</b>        | <b>Reclaimed Water Pumps (gpm)</b> | <b>Total Reclaimed Water Pumping Capacity (gpm)</b> | <b>Type of Storage</b> | <b>Storage Capacity (MG)</b> |
|----------------------------|------------------------------------|---|------------------------|------------------------------|
| Wastewater Treatment Plant | 1,400                              | 18,000  | Ground                 | 1.0                          |
|                            | 1,400                              |   | Ground                 | 1.0                          |
|                            | 1,400                              |   | Ground                 | 2.0                          |
|                            | 1,400                              |   | Ground                 | 2.0                          |
|                            | 2,600                              |   |                        |                              |
|                            | 2,600                              |   |                        |                              |
|                            | 3,600                              |   |                        |                              |
|                            | 3,600                              |   |                        |                              |
| North Pump Station         | 3,750                              | 7,500   | Ground                 | 2.0                          |
|                            | 3,750                              |   | Ground                 | 2.0                          |
| North Shore Pump Station   | 4,500                              | 13,500  | Ground                 | 3.0                          |
|                            | 4,500                              |   |                        |                              |
|                            | 4,500                              |   |                        |                              |
| <b>Total System</b>        |                                    | <b>39,000</b>                                       |                        | <b>13.0</b>                  |

\* Reclaimed Water Master Plan to be updated in 2012.

City of Apopka Water Supply Facilities Work Plan

**Table C-4**  
**2030 Summary of Facilities – Reclaimed Water Pump Stations**  
**(Source: Table 7-2 of 2005 Reclaimed Water Master Plan Update)\***

| <b>Pump Station</b>        | <b>Reclaimed Water Pumps (gpm)</b> | <b>Total Reclaimed Water Pumping Capacity (gpm)</b> | <b>Type of Storage</b> | <b>Storage Capacity (MG)</b> |
|----------------------------|------------------------------------|---|------------------------|------------------------------|
| Water Reclamation Facility | 1,400                              | 18,000  | Ground                 | 1.0                          |
|                            | 1,400                              |   | Ground                 | 1.0                          |
|                            | 1,400                              |   | Ground                 | 2.0                          |
|                            | 1,400                              |   | Ground                 | 2.0                          |
|                            | 2,600                              |   |                        |                              |
|                            | 2,600                              |   |                        |                              |
|                            | 3,600                              |   |                        |                              |
|                            | 3,600                              |   |                        |                              |
| North Pump Station         | 3,750                              | 11,250  | Ground                 | 2.0                          |
|                            | 3,750                              |   | Ground                 | 2.0                          |
|                            | 3,750                              |   |                        |                              |
| North Shore Pump Station   | 4,500                              | 18,000  | Ground                 | 3.0                          |
|                            | 4,500                              |   | Ground                 | 3.0                          |
|                            | 4,500                              |   |                        |                              |
|                            | 4,500                              |   |                        |                              |
| <b>Total System</b>        |                                    | <b>47,250</b>                                       |                        | <b>16.0</b>                  |

\* Reclaimed Water Master Plan to be updated in 2012.

City of Apopka Water Supply Facilities Work Plan

**Table C-5**  
**Summary of Proposed Potable Water Pipelines – Year 2005-2010**  
**(Source: Table 6-14 of 2005 Potable Water Master Plan Update)\***

| <b>Pipe Diameter (in)</b> | <b>Length (ft)</b> | <b>Cost (\$/ft)</b> | <b>Total Cost (\$1,000)</b> |
|---------------------------|--------------------|---------------------|-----------------------------|
| 6                         | 3,218              | 30                  | \$97                        |
| 8                         | 21,935             | 40                  | \$877                       |
| 10                        | 2,655              | 50                  | \$133                       |
| 12                        | 32,264             | 60                  | \$1,936                     |
| 16                        | 9,568              | 80                  | \$765                       |
| <b>Total</b>              | <b>69,640</b>      |                     | <b>\$3,808</b>              |

**Table C-6**  
**Summary of Proposed Potable Water Pipelines – Year 2011- 2020**  
**(Source: Table 6-15 of 2005 Potable Water Master Plan Update)\***

| <b>Pipe Diameter (in)</b> | <b>Length (ft)</b> | <b>Cost (\$/ft)</b> | <b>Total Cost (\$1,000)</b> |
|---------------------------|--------------------|---------------------|-----------------------------|
| 6                         | 9,352              | 30                  | \$281                       |
| 8                         | 18,634             | 40                  | \$745                       |
| 12                        | 41,455             | 60                  | \$2,487                     |
| 16                        | 20,072             | 80                  | \$1,606                     |
| <b>Total</b>              | <b>89,513</b>      |                     | <b>\$5,119</b>              |

\* Potable Water Master Plan to be updated in 2012.

City of Apopka Water Supply Facilities Work Plan

**Table C-7**  
**Summary of Proposed Reclaimed Water Pipelines – Year 2005-2010**  
 (Source: Table 7-7 of 2005 Reclaimed Water Master Plan Update)\*

| <b>Pipe Diameter (in)</b> | <b>Length (ft)</b> | <b>Cost (\$/ft)</b> | <b>Opinion of Probable Construction Cost (\$1,000)</b> |
|---------------------------|--------------------|---------------------|--|
| 6                         | 3,599              | 30                  | \$108  |
| 12                        | 28,405             | 60                  | \$1,704  |
| 16                        | 5,367              | 80                  | \$429  |
| 24                        | 13,378             | 120                 | \$1,605  |
| 30                        | 9,917              | 150                 | \$1,488  |
| 36                        | 4,615              | 180                 | \$831  |
| 48                        | 9,934              | 240                 | \$2,384  |
| <b>Total</b>              | <b>75,215</b>      |                     | <b>\$8,549</b>   |

**Table C-8**  
**Summary of Proposed Reclaimed Water Pipelines – Year 2011- 2020**  
 (Source: Table 7-8 of 2005 Reclaimed Water Master Plan Update)\*

| <b>Pipe Diameter (in)</b> | <b>Length (ft)</b> | <b>Cost (\$/ft)</b> | <b>Opinion of Probable Construction Cost (\$1,000)</b> |
|---------------------------|--------------------|---------------------|--|
| 8                         | 7,969              | 40                  | \$319  |
| 12                        | 66,348             | 60                  | \$3,981  |
| 16                        | 32,874             | 80                  | \$2,630  |
| 20                        | 30,948             | 100                 | \$3,095  |
| 24                        | 5,648              | 120                 | \$678  |
| 30                        | 21,743             | 150                 | \$3,261  |
| 36                        | 4,173              | 180                 | \$751  |
| 42                        | 4,413              | 210                 | \$926  |
| 48                        | 12,831             | 240                 | \$3,096 \$3,079  |
| <b>Total</b>              | <b>186,947</b>     |                     | <b>\$18,720</b>  |

\* Reclaimed Water Master Plan to be updated in 2012.

**APPENDIX D**  
**10 YEAR CAPITAL IMPROVEMENT PLAN**

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City of Apopka Water Supply Facilities Work Plan

**Table D-1  
Potable Water**

|   | FY 09/10         | FY 10/11         | FY 11/12           | FY 12/13         | FY 13/14         | FY 14/15           | FY 15/16           | FY 16/17         | FY 17/18         | FY 19/20         | FY 20/21           | TOTAL               |
|---|------------------|------------------|--------------------|------------------|------------------|--------------------|--------------------|------------------|------------------|------------------|--------------------|---------------------|
| <b>403/WATER IMPACT FUND</b>  |                  |                  |                    |                  |                  |                    |                    |                  |                  |                  |                    |                     |
| Haas Rd WM, Mt. Plymouth Rd to Round Lake Rd., 22,708 LF 12" (1)        |                  |                  |                    |                  |                  |                    |                    |                  |                  |                  | \$1,362,480        | \$1,362,480         |
| Kelly Park Rd WM, Golden Gem Rd to Round Lake Rd, 4,035 LF 16" (1)      |                  |                  |                    |                  |                  |                    | \$322,800          | \$400,320        |                  |                  |                    | \$400,320           |
| Kelly Park WM, Plymouth Sorrento Rd. to Golden Gem Rd, 6,672 LF 12" (1) |                  |                  |                    |                  | \$350,000        |                    |                    |                  |                  |                  |                    | \$322,800           |
| Lester Rd WM, Vick Rd. to Rock Springs Ridge (1)                        |                  |                  |                    |                  |                  |                    |                    |                  |                  |                  |                    | \$350,000           |
| Miscellaneous Water Mains (2)   | \$100,000        | \$100,000        | \$100,000          | \$100,000        | \$100,000        | \$100,000          | \$100,000          | \$100,000        | \$100,000        | \$100,000        | \$100,000          | \$1,100,000         |
| NW WTP (1 High Speed Pump) (2)  | \$170,000        |                  |                    | \$750,000        |                  |                    |                    |                  |                  |                  |                    | \$170,000           |
| NW WTP (1 MG Storage Tank) (1)  |                  |                  |                    |                  |                  | \$1,027,488        |                    |                  |                  |                  |                    | \$750,000           |
| Plymouth Sorrento Rd WM, Ponkan Rd. to Kelly Park Rd. (1)               |                  |                  |                    |                  |                  |                    |                    |                  |                  |                  |                    | \$1,027,488         |
| Plymouth Sorrento Rd WM, Yothers Rd to Ponkan Rd. (1)                   |                  |                  |                    |                  | \$390,744        |                    |                    |                  |                  |                  |                    | \$390,744           |
| Plymouth Water Plant HSP upgrade (2)                                    |                  | \$125,000        |                    |                  |                  |                    |                    |                  |                  |                  |                    | \$125,000           |
| Plymouth Water Plant (Well, 1MG Storage Tank) (1)                       |                  |                  | \$1,900,000        |                  |                  |                    |                    |                  |                  |                  |                    | \$1,900,000         |
| Sheeler Oaks WTP GST .5MG (1)   |                  |                  |                    |                  |                  |                    | \$3,234,000        |                  |                  |                  | \$600,000          | \$600,000           |
| Southwest Water Plant (1)   |                  |                  |                    |                  |                  |                    |                    |                  |                  | \$240,000        |                    | \$3,234,000         |
| US441 WM, Roger Williams Rd to Sheeler Rd. (1)                          |                  |                  |                    |                  |                  |                    |                    |                  |                  |                  |                    | \$240,000           |
| Water Master Plan Update (2)  |                  |                  | \$50,000           |                  |                  |                    |                    |                  |                  |                  |                    | \$50,000            |
| <b>TOTAL WATER IMPACT FUND</b>  | <b>\$270,000</b> | <b>\$225,000</b> | <b>\$2,050,000</b> | <b>\$850,000</b> | <b>\$840,744</b> | <b>\$1,127,488</b> | <b>\$3,656,800</b> | <b>\$500,320</b> | <b>\$100,000</b> | <b>\$340,000</b> | <b>\$2,062,480</b> | <b>\$12,022,832</b> |

(1) Water Impact Fees

(2) Utility Operation Fund

City of Apopka Water Supply Facilities Work Plan

**Table D-2**  
**Sanitary Sewer**

| 403/SEWER IMPACT FUND   | FY 09/10         | FY 10/11            | FY 11/12            | FY 12/13         | FY 13/14         | FY 14/15         | FY 15/16           | FY 16/17           | FY 17/18           | FY 19/20         | FY 20/21           | TOTAL               |
|---|------------------|---------------------|---------------------|------------------|------------------|------------------|--------------------|--------------------|--------------------|------------------|--------------------|---------------------|
| Miscellaneous Sewer Mains (2)   | \$100,000        | \$100,000           | \$100,000           | \$100,000        | \$100,000        | \$100,000        | \$100,000          | \$100,000          | \$100,000          | \$100,000        | \$100,000          | \$1,100,000         |
| Plymouth Sorrento Rd. FM, Ponkan Rd. to Yothers Rd., 5,840 LF 12" (1) |                  | \$350,400           |                     |                  |                  |                  |                    |                    |                    |                  |                    | \$350,400           |
| WWTP Expansion to 8 MGD (3)   |                  | \$13,000,000        | \$18,500,000        |                  |                  |                  |                    |                    |                    |                  |                    | \$31,500,000        |
| Sewer Master Plan Update (2)  |                  |                     | \$50,000            |                  |                  |                  |                    |                    |                    |                  |                    | \$50,000            |
| Plymouth Rd. FM, Ponkan Rd to Kelly Park, 1,095 LF 12" (1)            |                  |                     |                     | \$657,060        |                  |                  |                    |                    |                    |                  |                    | \$657,060           |
| Clarcona Rd FM, WWTP to Keene Rd, 4,456 LF 30" (1)                    |                  |                     |                     |                  |                  |                  | \$668,400          |                    |                    |                  |                    | \$668,400           |
| Keene Rd FM, Clarcona Rd to Marden Rd, 7,562 LF 30" (1)               |                  |                     |                     |                  |                  |                  |                    | \$1,134,300        |                    |                  |                    | \$1,134,300         |
| Marden Rd FM, Keene Rd to 437 A, 10,262 LF 30" (1)                    |                  |                     |                     |                  |                  |                  |                    |                    | \$1,539,300        |                  |                    | \$1,539,300         |
| 437 A FM, Marden Rd to Boy Scout Rd, 1,345 LF 24" (1)                 |                  |                     |                     |                  |                  |                  |                    |                    |                    | \$161,400        |                    | \$161,400           |
| Boy Scout Rd FM, 437 A to Binion Rd, 5,128 LF 24" (1)                 |                  |                     |                     |                  |                  |                  |                    |                    |                    | \$615,000        |                    | \$615,000           |
| Binion Rd FM, Boy Scout Rd to US 441, 10,234 LF 24" (1)               |                  |                     |                     |                  |                  |                  |                    |                    |                    |                  | \$1,228,080        | \$1,228,080         |
| US 441 FM, Boy Scout Blvd to Plymouth 6,654 LF 16" (1)                |                  |                     |                     |                  |                  |                  |                    | \$532,320          |                    |                  |                    | \$532,320           |
| Plymouth Rd. FM, US 441 to Yothers Rd, 5,323 LF 16" (1)               |                  |                     |                     |                  |                  |                  | \$425,840          |                    |                    |                  |                    | \$425,840           |
| Junction Rd. FM, US 441 to Sadler Rd, 13,025 LF 16" (1)               |                  |                     |                     |                  | \$651,250        |                  |                    |                    |                    |                  |                    | \$651,250           |
| Junction Rd FM, Sadler Rd to Kelly Park Rd, 2,627 LF 10" (1)          |                  |                     |                     |                  |                  | \$131,350        |                    |                    |                    |                  |                    | \$131,350           |
| <b>TOTAL SEWER IMPACT FUND</b>  | <b>\$100,000</b> | <b>\$13,450,400</b> | <b>\$18,650,000</b> | <b>\$757,060</b> | <b>\$751,250</b> | <b>\$231,350</b> | <b>\$1,194,240</b> | <b>\$1,766,620</b> | <b>\$1,639,300</b> | <b>\$876,400</b> | <b>\$1,328,080</b> | <b>\$40,744,700</b> |

(1) Sewer Impact Fees

(2) Utility Operation Fund

(3) Bond Issue

City of Apopka Water Supply Facilities Work Plan

**Table D-3  
Reclaimed Water**

| 403/RECLAIM IMPACT FUND  | FY 09/10    | FY 10/11    | FY 11/12    | FY 12/13    | FY 13/14  | FY 14/15    | FY 15/16  | FY 16/17     | FY 17/18  | FY 19/20    | FY 20/21  | TOTAL        |
|--|-------------|-------------|-------------|-------------|-----------|-------------|-----------|--------------|-----------|-------------|-----------|--------------|
| 2MG Storage Tank @ WWTP (2)  |             |             |             |             |           | \$1,100,000 |           |              |           |             |           | \$1,100,000  |
| Binion Rd RWM, Lust Rd. to Harmon Rd., 6,774 LF 36"/30" *(1)         | \$1,097,550 |             |             |             |           |             |           |              |           |             |           | \$1,097,550  |
| Binion Rd RWM, Lust Rd. to Old Dixie Hwy, 9,602 LF 48" *(1)          | \$2,600,000 |             |             |             |           |             |           |              |           |             |           | \$2,600,000  |
| Boy Scout Road RWM, Binion Rd. to Bronson property, 2,200 LF 16" (2) |             | \$176,000   |             |             |           |             |           |              |           |             |           | \$176,000    |
| Clarcona Rd RWM, Keene Rd to WWTP, 5,259 LF 48" (1)                  |             | \$1,514,596 |             |             |           |             |           |              |           |             |           | \$1,514,596  |
| Keene Rd RWM, Marden Rd to Clarcona Rd., 7,562 LF 48" (1)            |             | \$2,177,856 |             |             |           |             |           |              |           |             |           | \$2,177,856  |
| Kelly Park Rd RWM, Golden Gem Rd to Round Lake Rd (2)                |             |             |             |             |           |             |           |              |           |             | \$964,080 | \$964,080    |
| Kelly Park RWM, Jason Dwelley Parkway to Plymouth Sorrento Rd. (2)   |             |             |             |             | \$677,760 |             |           |              |           |             |           | \$677,760    |
| Kelly Park RWM II, Jason Dwelley to Mt Plymouth Rd (2)               |             |             |             |             |           |             | \$954,960 |              |           |             |           | \$954,960    |
| Kelly Park RWM, Mt Plymouth Rd. to Rock Springs Rd (2)               |             |             |             |             |           |             |           | \$216,000    |           |             |           | \$216,000    |
| Kelly Park RWM, Plymouth Sorrento Rd. to Golden Gem Rd (2)           |             |             |             |             |           |             |           |              |           |             | \$963,720 | \$963,720    |
| Lake Apopka Plant, NSRA *(1) & *(3)                                  |             | \$1,000,000 | \$4,900,000 | \$5,900,000 |           |             |           |              |           |             |           | \$11,800,000 |
| Lester Rd RWM, Vick Rd. to Rock Springs Ridge (2)                    |             |             |             |             | \$317,000 |             |           |              |           |             |           | \$317,000    |
| Lust Road RWM, Binion to Lake Apopka plant, 2,628 LF 36" *(1)        |             |             | \$473,040   |             |           |             |           |              |           |             |           | \$473,040    |
| Marden Rd RWM, Keene to Emerson Park, 5,422 LF 20" (2)               |             |             |             | \$542,200   |           |             |           |              |           |             |           | \$542,200    |
| Miscellaneous RWM (5)  | \$50,000    | \$50,000    | \$50,000    | \$50,000    | \$50,000  | \$50,000    | \$50,000  | \$50,000     | \$50,000  | \$50,000    | \$50,000  | \$550,000    |
| Plymouth Sorrento Rd RWM, Ponkan Rd. to Kelly Park Rd. (2)           |             |             |             |             |           |             |           |              |           | \$1,121,760 |           | \$1,121,760  |
| Plymouth Sorrento RWM, Yothers Rd. to Ponkan Rd. (2)                 |             |             |             |             |           |             |           |              | \$650,400 |             |           | \$650,400    |
| Project Renew (OUC) (4)  |             |             |             |             |           | \$9,203,500 |           | \$18,177,400 |           |             |           | \$27,380,900 |

City of Apopka Water Supply Facilities Work Plan

| 403/RECLAIM IMPACT FUND                                     | FY 09/10           | FY 10/11           | FY 11/12           | FY 12/13           | FY 13/14           | FY 14/15            | FY 15/16           | FY 16/17            | FY 17/18         | FY 19/20           | FY 20/21           | TOTAL               |
|---|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|--------------------|---------------------|------------------|--------------------|--------------------|---------------------|
| Reclaim Master Plant Update (5)                             |                    |                    | \$50,000           |                    |                    |                     |                    |                     |                  |                    |                    | \$50,000            |
| Rogers Rd. RWM, Lester Rd. to Ponkan Rd., 5,814 LF 30" *(1) |                    | \$872,100          |                    |                    |                    |                     |                    |                     |                  |                    |                    | \$872,100           |
| Schopke Rd. RWM, Schopke-Lester Rd. to Plymouth Rd. (2)     |                    |                    |                    |                    | \$288,000          |                     |                    |                     |                  |                    |                    | \$288,000           |
| <b>TOTAL RECLAIM IMPACT FUND</b>                            | <b>\$3,747,550</b> | <b>\$5,790,552</b> | <b>\$5,473,040</b> | <b>\$6,492,200</b> | <b>\$1,332,760</b> | <b>\$10,353,500</b> | <b>\$1,004,960</b> | <b>\$18,443,400</b> | <b>\$700,400</b> | <b>\$1,171,760</b> | <b>\$1,977,800</b> | <b>\$56,487,922</b> |

\*(1) Sewer Impact Fees with a 30% grant from St. Johns River Water Management District

(1) Sewer Impact Fees

(2) Reclaimed Water Impact Fees

\*(3) Bond Issue with a 30% grant from St. Johns River Water Management District; Lake Apopka Plant NSRA \$5,900,000 FY 12/13

(4) Bond Issue

(5) Utility Operation Fund

City of Apopka Water Supply Facilities Work Plan

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## APPENDIX E

### Apopka Water Service Area Map

# City of Apopka Water Supply Facilities Work Plan

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City of Apopka Water Supply Facilities Work Plan  
City of Apopka Water Utility Service Area

