

APPENDIX A



CITY OF CLERMONT
WATER SUPPLY FACILITIES
WORK PLAN

January 12, 2010
(Ordinance 625-M)

City of Clermont
685 West Montrose Street
Clermont, Florida 34711

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WATER SUPPLY FACILITIES WORK PLAN

A. 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 all of the state of Florida with its potable water. As with all sources of fresh water, the Floridan Aquifer is not an unlimited resource. The Florida Legislature enacted bills in 2002, 2004 and 2005 to address the state's water supply needs. These bills, especially Senate bills 360 and 444 (2005 legislative session), significantly changed chapters 163 and 373, Florida Statutes (F.S.) by strengthening the statutory links between the regional water supply plans prepared by the water management districts and the comprehensive plans prepared by local governments. In addition, these bills established the basis for improving coordination between local land use planning and water supply planning.

Chapter 163, Part II, F.S., requires local governments to prepare and adopt a Water Supply Facilities Work Plan (work plan) into their comprehensive plans within 18 months after the water management district approves a regional water supply plan or its update. The City of Clermont is located within the St. Johns River Water Management District (SJRWMD) in a designated Priority Water Resource Caution Area (PWRCA). The 2005 PWRCA District Water Supply Plan was approved by the SJRWMD governing board on February 7, 2006. The deadline for local governments within the SJRWMD's PWRCA jurisdiction to amend their comprehensive plans to adopt a work plan was August 7, 2007. The City of Clermont was in the process of updating its master water utility plan at that time and did not want to prepare the work plan until the updated data and analysis from this utility plan was completed. The City approved the master water utility plan in September 2008.

The City of Clermont provides all potable water and reclaimed water within its service area, with the exception of the Orange Lake Mobile Home Park, which is served by Florida Utility Group. The City is responsible for ensuring enough capacity is available for existing and future water users. The purpose of the City of Clermont work plan is to identify and plan for the water supply sources and facilities needed to serve the existing population and future development expected within the City's service area through 2020. The Clermont work plan must:

1. Project the City's water needs for at least a 10-year period;
2. Identify and prioritize the City's water supply facilities and the primary source and alternate source(s) of water needed to meet projected demand;
3. Include the capital improvements needed for the first five years, including financially feasible revenue sources; and
4. Include a 10-year capital improvements schedule.

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B. BACKGROUND INFORMATION

At the time of adoption of the City's comprehensive plan in 1991, the City's land area was 4,324 acres. In 2000 the U.S. Census population was 9,933. In 2002 the City had grown to 7,360 acres through annexation. By 2008 the City had grown to 9,228 acres. Through annexation and unprecedented residential growth, the population in 2008 was estimated at 23,476¹. Projections in the City's updated comprehensive plan indicate an increase in population to 44,480, including seasonal population, by 2020². The population estimates and projections were developed by the Shimberg Center for Affordable Housing. It should be noted, however, that the Shimberg population projections include population growth trends from 2000 to 2005 when the City experienced a period of unprecedented growth. From 2005 to 2008, BEBR estimated the growth to be 5.76 percent. The 2010 U.S. Census population statistics should be available for use in 2011 and will more accurately show the population in the City. At that time, the City expects the Shimberg projections to be revised downward as a reflection of the slowdown in population growth actually experienced in Clermont after 2006.

The current existing land use breakdown within the City limits is approximately 36% residential, 10% office/commercial, <1% industrial, 13% public lands and institutional (including park and golf courses) and 16% vacant. The remaining 26% consists of water and roadways. Approximately 1,510 acres of land is vacant in the City: 187 acres categorized residential future land use (12%); 1,017 acres of mixed-use land use (67%); 304 acres of office, commercial and industrial future land use (20%); and two acres of public facilities and institutional land use (<1%). Based on permitted densities and intensities and percentages of land use distributions allowed within each future land use category, the projected build-out for the City within its current boundary is 8,383 residential dwelling units and approximately eight million square feet of office, commercial and industrial land use.

1. City of Clermont Potable Water Service Area

The City of Clermont water utility service area includes all property within the City limits and within the Lake County/City of Clermont JPA boundary outside the City limits as shown in **Figure 1**. The Clermont potable water service area is not expected to change through the 2020 planning horizon.

2. Agreements for Potable Water Services in the Clermont PWS

The City of Clermont is the primary water service provider within the Joint Planning Area (JPA) based on its interlocal agreement with Lake County for the JPA and a stipulated settlement agreement with Lake Utility Services, Inc. for certain shared service areas. The City is a member of the Lake County Water Alliance and has an agreement to that effect. Additionally, the City has agreements with private property owners for the provision of water services to developments that were annexed into the City. The City has not entered into a memo of understanding with the St. Johns River Water Management District (SJRWMD) for the St. Johns River near Deland alternative water supply project and does not anticipate doing so until a decision has been made relating to the current request to modify consumptive use permit (CUP) #2478. **Table 1** provides a summary of the City of Clermont's existing interlocal agreements relating to potable water services.

¹ University of Florida, Bureau of Economic and Business Research (BEBR), Medium Projections for April 1, 2008

² Shimberg Center for Housing Studies, Population Projection 1990-2030, 2008

In its 2009 comprehensive plan update, the City included several policies in the Future Land Use, Potable Water and Intergovernmental Coordination elements that provide enabling language for future agreements such as the ones listed in Table 1. The City is prepared to amend existing agreements and execute new agreements as they are warranted.

Table 1: Summary of Agreements Related to Provision of Water Services

Name of Agreement	Parties to the Agreement	Effective Date	Expiration Date	Description
Joint Planning Area	Lake County and the City of Clermont	2003	None	Establishes boundaries in Lake County in which the City of Clermont and Lake County share planning and development responsibilities to provide for orderly growth.
Settlement Agreement	City of Clermont and Lake Utility Services, Inc.	8/26/2003	None	Establishes boundaries of shared areas for which each entity has the right to provide water and wastewater service
Development Agreement	City of Clermont and Clermont Partners	4/5/2005	None	Establishes conditions of development for Hartle Groves, a residential subdivision outside the City limits, including the condition that the project shall be served by the public facilities available from the City of Clermont
Development Agreement	City of Clermont and Flor & Adelina Tellado	10/23/2007		Establishes conditions of development for the Tellado property, a residential subdivision outside the City limits, including the condition that the project shall be served by the public facilities available from the City of Clermont
Development Agreement	City of Clermont and M/I Homes, LLC and David E. Warren	11/9/2007	None	Establishes conditions of development for Johns Lake Landing, a residential subdivision outside the City limits, including the condition that the project shall be served by the public facilities available from the City of Clermont
Development Agreement	City of Clermont and Jose and Madeline Ortiz	3/10/2009	None	Establishes conditions of development for Bella Tera, a residential subdivision outside the City limits, including the condition that the project shall be served by the public facilities available from the City of Clermont

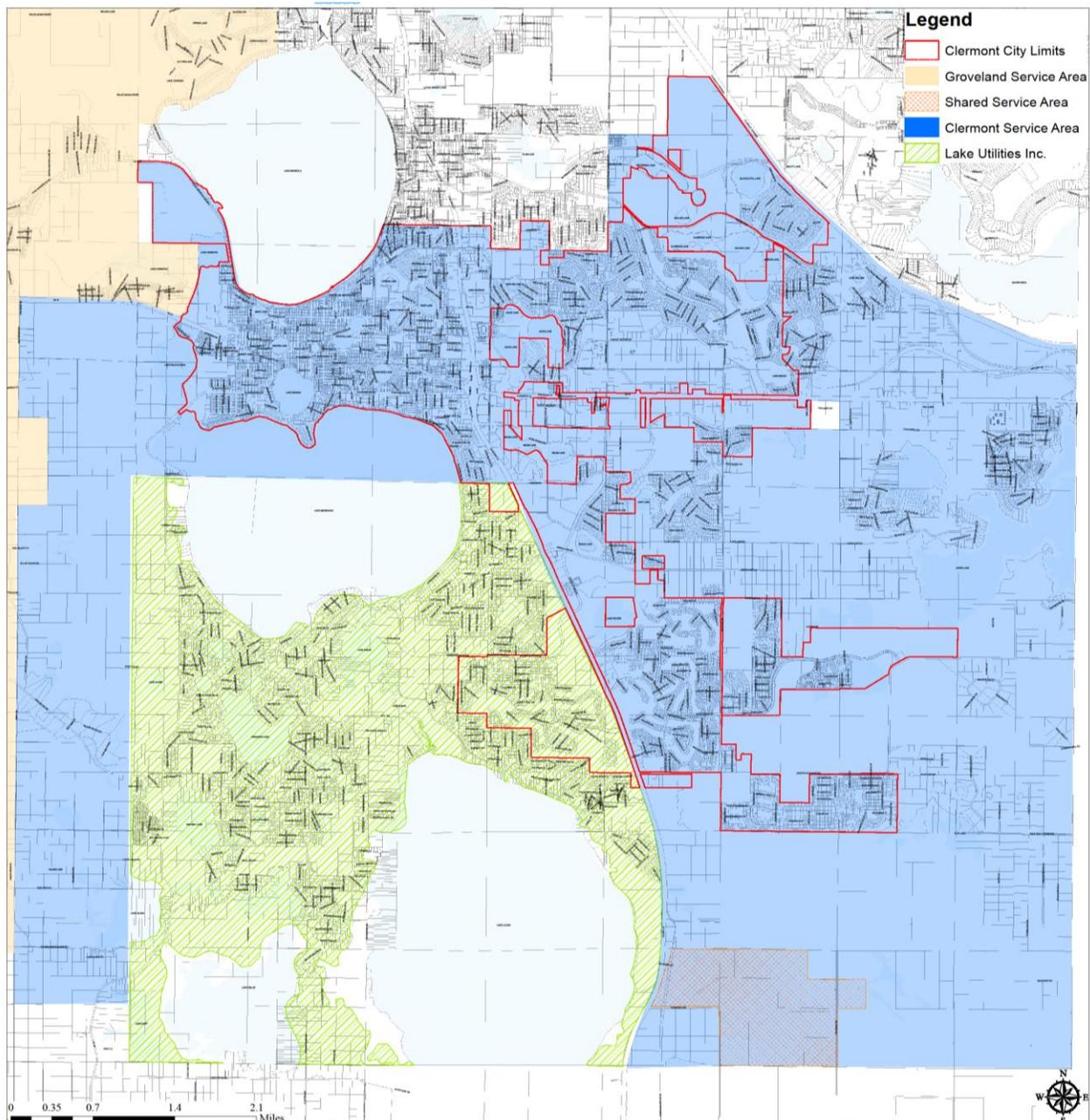
Source: Boyle Engineering, City of Clermont CUP #2478 Permit Modification Response Letter to RAI #3 dated February 6, 2009

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3. Potable Water Level of Service Standard

The detailed analysis by Boyle Engineering in its Consumptive Use Permit (CUP) application submitted for the City in 2007 showed that the historical average daily flow per capita for the five years ending in 2006 was 187 gallons per capita per day (gpcd). Based on this average and on the assumption that the City's conservation programs and higher reclaimed water capacity will reduce potable water usage, the City adopted a level of service (LOS) standard of 185 gpcd in its 2009 updated comprehensive plan through the 2020 planning horizon, which is lower than the former adopted standard of 198 gpcd in the 2002 comprehensive plan.

Figure 1: City of Clermont Water Service Area, 2009



Source: City of Clermont, 2009

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C. CLERMONT WATER SYSTEM FACILITIES

The existing Clermont potable water system includes water supply, treatment and storage facilities located throughout the water service area. In addition, the City provides treated wastewater effluent (reclaimed water) in lieu of potable water for irrigation use. A summary of the City's potable water system and reclaimed water facilities is presented in this section.

1. Permitted Capacity

a. Consumptive Use Permit (CUP)

On September 10, 2002, the St. Johns River Water Management District (SJRWMD) issued Consumptive Use Permit (CUP) #2478 for the City of Clermont (see **Table 2**). This CUP authorizes the use of 1,378.06 million gallons per year, or 3.78 million gallons per day (mgd), of ground water from an Upper Floridan Aquifer for public supply uses in the years 2013-2022. In addition, CUP #2478 requires the City to distribute 0.90 mgd of reclaimed water per day from the East Wastewater Treatment Facility (East WWTF) starting in 2007.

Table 2: CUP #2478 Ground Water Use Allocations

Year	Permitted Water Use Allocations		
	Total Million Gallons Per Day (mgd)	Clermont East Million Gallons Per Day (mgd)	Clermont West Million Gallons Per Day (mgd)
2002	5.63	3.55	2.08
2003	6.22	4.12	2.10
2004	6.59	4.46	2.13
2005	6.92	4.77	2.15
2012	7.38	5.25	2.12
2013	3.78	2.26	1.52
2022	3.78	2.26	1.52

Source: *City of Clermont Consumptive Use Permit Modification Application*, 2007

b. CUP #2478 Requested Modification

On January 24, 2007 the City of Clermont applied for a modification to CUP #2478. Specifically, the City requested an Upper Floridan Aquifer withdrawal increase from 1,379.7 mgy (3.78 mgd) to 2,883.5 mgy (7.90 mgd)³ by 2022. Note that SJRWMD has limited the City to the water withdrawals as noted above under the current CUP (**Table 2**).

This work plan is based on the data submitted with the requested CUP #2478 modification, including data submitted with applicable City responses to SJRWMD'S requests for additional information (RAI).

³ Boyle Engineering, *City of Clermont 2006 Consumptive Use Permit Modification Application*, January 2007, p ES-1

2. Potable Water Service Users

The potable water service area depicted in **Figure 1** encompasses approximately 2,700 acres. In 2006, the City provided potable water to approximately 16,887 service connections with consumption characteristics as described in **Table 3**.

Table 3: City of Clermont 2006 Water Use by Customer Type

Type of User	Water Consumption mgal	Water Consumption mgd	Percentage of Total Consumption
Single Family Residential	1,262.76	3.46	57.3%
Multi-Family	49.78	0.14	2.3%
Commercial	218.32	0.60	9.9%
Irrigation	673.22	1.84	30.5%
Totals	2,204.08	6.04	100.0%

Source: Boyle Engineering, Response Letter to RAI #1, February 21, 2007, Appendix B

3. Potable Water Treatment Facilities

The City of Clermont currently owns and operates two separate potable water treatment systems – the East Side and the West Side systems. The East Side PWS includes six potable water wells, one elevated storage tank and two ground storage tanks. The West Side PWS includes three potable water wells and two elevated storage tanks and is proposing an additional well. **Tables 4 and 5** summarize the current potable ground water sources and treatment processes.

Table 4: Summary of Existing Potable Ground Water Sources

Well Name & District ID	Facility Name	Casing diameter (in)	Casing Depth (ft)	Depth Total (ft)	Pump Capacity (gpm)	Year Drilled
East Side Potable Water System (PWS ID #335-4779)						
E-1/10364	Greater Hills North	16	200	750	1,400	1981
E-2/10365	Greater Hills South	18	1,150	1,200	1,800	1990
E-3/10366	Hancock Road	18	360	885	1,500	1995
E-4/33694	Elevated Tank	18/24	365	912	1,940	2002
E-5/33695	Sunburst Lane	24	346	900	3,500	2003
E-6/33696	Heritage Hills (Royale)	24	338	875	3000	2009
West Side Potable Water System (PWS ID #335-0215)						
W-1/9167	Seminole Avenue	10	517	840	1,625	1975
W-2/9168	Fourth Street	12	605	790	1,650	1981
W-3/9169	Grand Highway	12	600	918	1,500	1965
W-4/33697	Lakeview (Harley), Capped	N/A				
W-5/242843	Dairy Queen - Proposed					

Well E-7 (Middle School well) is an existing grove irrigation well. The City plans to rehab the well and use it for reclaimed water supplement. The work on this project has not begun.

Well E-8 (Oakley Seaver well) was a proposed irrigation well, but the City is no longer pursuing its use. It was not constructed.

Source: Boyle Engineering, *City of Clermont CUP Application #2478*, January 2007; Response Letter to RAI #1 dated February 21, 2007

Table 5: Existing Well Treatment Process Descriptions

Plant #	Plant Name	Objective	Process Description
East Side Potable Water System (PWS ID #335-4779)			
1	Greater Hill WTP	Disinfect	Hypochlorination
2	Sunburst Lane WTP	Disinfect Other	Hypochlorination Aeration
West Side Potable Water System (PWS ID #335-0215)			
1	WTP#1/ Fourth Street Well	Disinfect Corrosion Control	Gaseous Chlorination Corrosion Inhibition
2	WTP #2/ Seminole Avenue Well	Disinfect Corrosion Control	Gaseous Chlorination Corrosion Inhibition
3	WTP #3/ Grand Highway Well	Disinfect Corrosion Control	Gaseous Chlorination Corrosion Inhibition

Source: FDEP Basic Facility Report February 28, 2008

a. Existing Demand Surpluses and Deficiencies

- (1) Water System Capacity. FDEP criteria⁴ require that the capacity of all wells must be able to meet maximum daily demand (MDD) as well as the average annual day demand (AADD) with the largest well out of service. Based on the water system capacity figures described in **Table 6** the City's East PWS and West PWS both have adequate capacity to serve all of the existing residential and non-residential units that are currently connected.
- (2) Water System Storage. FDEP criteria⁵ state that the total useful finished-water storage capacity (excluding any storage capacity for fire protection) connected to a water system shall at least equal 25 percent of the system's MDD, excluding any fire-flow demand.

Based on the water system capacity figures described in **Table 7**, the total system storage volume of the East PWS is sufficient to meet the current City customers' demands, while the storage volume of the West PWS is not sufficient.

- (3) Water System Flow. Per FDEP requirements⁶, high service pumping must have the capability to meet whichever is the largest flow: the peak hourly flow (PHF) or maximum day demand plus fire flow (MDD + FF). When system elevated storage is available, the combination of storage and high service pumping must meet the most stringent peak flow requirement.

Based on the water system capacity figures described in **Table 8**, the total system flow capacity of both the East PWS and the West PWS are sufficient to meet the current City demands.

⁴ 62-555.315(3) F.A.C.

⁵ 62-555.315(3) F.A.C.

⁶ 62-555.320(15) F.A.C.

Table 6: Clermont Potable Water System Capacity –2006

East PWS		West (PWS)	
Description	Flow (mgd)	Description	Flow (mgd)
Pump Capacity (see Table VII-5) (Sunburst out of Service)	10.196	Pump Capacity (Fourth Street out of Service)	3.13
AADD	4.90	AADD	1.63
Surplus/ (Deficit)	5.296	Surplus/ (Deficit)	1.50
Meets FDEP Requirement?	Yes	Meets FDEP Requirement?	Yes
Pump Capacity (see Table VII-5) (All Wells)	14.60	Pump Capacity (see Table VII-5) (All Wells)	4.78
MDD	8.34	MDD	2.86
Surplus/ (Deficit)	6.26	Surplus/ (Deficit)	1.92
Meets FDEP Requirements?	Yes	Meets FDEP Requirements?	Yes

Source: Boyle Engineering, *City of Clermont 2006 Consumptive Use Permit Modification Application*, January 2007; Response Letter to RAI #1 dated February 21, 2007, Tables 3a and 3b.

Table 7: Clermont Potable Water System Storage, 2006

East PWS		West PWS	
Description	Volume (mgal)	Description	Volume (mgal)
MDD	8.34	MDD	2.86
Total Storage	3.40	Total Storage	0.60
25% MDD	2.08	25% MDD	0.71
Surplus/ (Deficit)	1.32	Surplus/ (Deficit)	(0.11)
Meet FDEP Requirements?	Yes	Meet FDEP Requirements?	No

Source: City of Clermont, 2008

Table 8: Clermont Potable Water System Flow, 2006

East PWS		West PWS	
Description	Flow (gpm)	Description	Flow (gpm)
AADD	3,400	AADD	1,130
MDD	5,790	MDD	1,990
Capacity	20,200	Capacity	4,775
MDD + FF (1,500 gpm)	7,290	MDD + FF (1,500 gpm)	3,490
PHF (ADD x 4)	13,600	PHF (ADD x 4)	4,520
Surplus/ (Deficit)	6,310	Surplus/ (Deficit)	255
Meet FDEP Requirements?	Yes	Meet FDEP Requirements?	Yes

Source: City of Clermont, 2008

b. Future Demand Capacity

The FDEP requires⁷ that the total useful finished-water storage capacity (excluding any storage capacity for fire protection) connected to a water system shall equal at least 25 percent of the system's maximum-day water demand, excluding any design fire-flow demand. **Tables 9 and 10** describe the future demand capacity for the East Side and West Side potable water systems.

- (1) **Water System Capacity.** Up to 2020, the East PWS and West PWS provide sufficient capacity per the FDEP requirements.
- (2) **Water System Storage.** FDEP criteria⁸ state that the total useful finished-water storage capacity (excluding any storage capacity for fire protection) connected to a water system shall at least equal 25 percent of the system's MDD, excluding any fire-flow.
- (3) **Water System Flow.** Up to 2020, both the East PWS and the West PWS are expected to provide sufficient flow per FDEP requirements.

Table 9: East Side Potable Water System Future Demand Capacity

East PWS	2010	2015	2020
Supply Capacity Largest Well out of Service (mgd)	9.56	9.56	9.56
AADD (mgd)	4.95	5.70	5.87
Surplus (Deficit) Capacity (mgd)	4.61	3.86	3.69
Meet Capacity Requirements?	No	No	No
Supply Capacity All Wells in Service(mgd)	14.60	14.60	14.60
MDD (mgd)	9.01	10.36	10.68
Surplus (Deficit) Capacity (mgd)	5.59	4.24	3.92
Meet Capacity Requirements?	Yes	Yes	Yes
MDD (mgal)	9.01	10.36	10.68
Total Storage (mgal)	3.40	3.40	3.40
25% MDD (mgal)	2.25	2.59	2.67
Surplus/ (Deficit) (mgal)	1.15	0.81	0.73
Meet Storage Requirements?	Yes	Yes	Yes
Pumping Capacity (gpm)	20,200	20,200	20,200
Peak Hour Flow (AADD x 4) (gpm)	13,750	15,833	16,305
Max Day + Fire Flow (1,500) (gpm)	7,756	8,694	8,916
Surplus (Deficit) Capacity (gpm)	6,450	4,366	3,894
Meet Flow Requirements?	Yes	Yes	Yes

Source: Boyle Engineering, *City of Clermont 2006 Consumptive Use Permit Modification Application*, January 2007; Response Letter to RAI #1 dated February 21, 2007, Table 4b.

⁷ 62-555.320(19) (a) F.A.C

⁸ 62-555.315(3) F.A.C.

Table 10: West Side Potable Water System Future Capacity

West PWS	2010	2015	2020
Supply Capacity Largest Well out of Service (mgd)	3.13	3.13	3.13
AADD (mgd)	1.73	1.75	1.78
Surplus (Deficit) Capacity (mgd)	1.40	1.38	1.36
Supply Capacity Meets FDEP Requirements?	Yes	Yes	Yes
Supply Capacity All Wells in Service (mgd)	4.78	4.78	4.78
MDD (mgd)	3.32	3.35	3.42
Surplus (Deficit) Capacity (mgd)	1.46	1.43	1.36
Supply Capacity Meets FDEP Requirements?	Yes	Yes	Yes
MDD (mgal)	3.32	3.35	3.42
Total Storage (mgal)	0.60	0.60	0.60
25% MDD (mgal)	0.83	0.84	0.85
Surplus/ (Deficit) (mgal)	(0.23)	(0.24)	(0.25)
Storage Capacity Meets FDEP Requirements?	No	No	No
Pumping Capacity AADD (gpm)	4,775	4,775	4,775
Peak Hour Flow (AADD x 4) (gpm)	1,201	1,215	1,236
Max Day + Fire Flow (1,500) (gpm)	3,805	3,826	3,875
Surplus (Deficit) Capacity (gpm)	970	949	900
Pumping Capacity Meets FDEP Requirement?	Yes	Yes	Yes

Source: Boyle Engineering, *City of Clermont 2006 Consumptive Use Permit Modification Application*, January 2007, Response Letter to RAI #1 dated February 21, 2007, Table 4a.

4. Reclaimed Water Service Area and Facilities

The City of Clermont owns and operates one wastewater reclamation facility (WRF), the East-Side WRF, under FDEP permit # FLA010515, which expires on December 2, 2012. **Figure 2** depicts the reclaim water service area for the City of Clermont located in the south portion of the City.

a. East-Side Wastewater Reclamation Facility (WRF)

The existing East-Side WRF has a current design capacity of 4.0 million gallons per day (mgd); however, it has been master planned to be expandable to 8.0 mgd as well as sized to pump 26 mgd of reclaimed water. The facility consists of influent screening, grit removal, splitter box, anoxic basin, aeration, secondary clarification, chemical feed, filtration and chlorination with aerated sludge holding tank and dewatering of residuals. The East Side WRF includes a 2.0-million gallon reclaimed water storage tank and a high-service pump station with a capacity of 16 mgd.

The facility's reuse land application consists of a 0.75 mgd AADF permitted capacity rapid infiltration basin (RIB) system, (R-001), which consists of 15 RIBs with a total wetted area of 4.76 acres. The facility also has an existing 4.0 mgd AADF permitted capacity slow-rate public access system (R-002) consisting of the new 2.0-mgal storage tank, lined storage ponds at the Kings Ridge Golf Course (3.6 mgal total volume). The reuse system is available to the service area shown on **Figure 2** and is distributed to the users listed in **Table 11**.

b. West-Side Wastewater Treatment Plan (WWTP)

The West-Side WWTP is an existing 0.95 mgd design capacity contact stabilization domestic wastewater treatment plant consisting of flow equalization, influent screening, comminution, grit removal, aeration, secondary clarification, chlorination and aerobic digestion of residuals followed by sludge drying beds. Flows to the facility are limited to 0.75 mgd AADF, the capacity of the sprayfield. The West-Side WWTP is being converted to a regional transfer pump station to supply the East-Side WRF with additional reclaimed source water capacity. Construction for the conversion is anticipated to be complete in 2009.

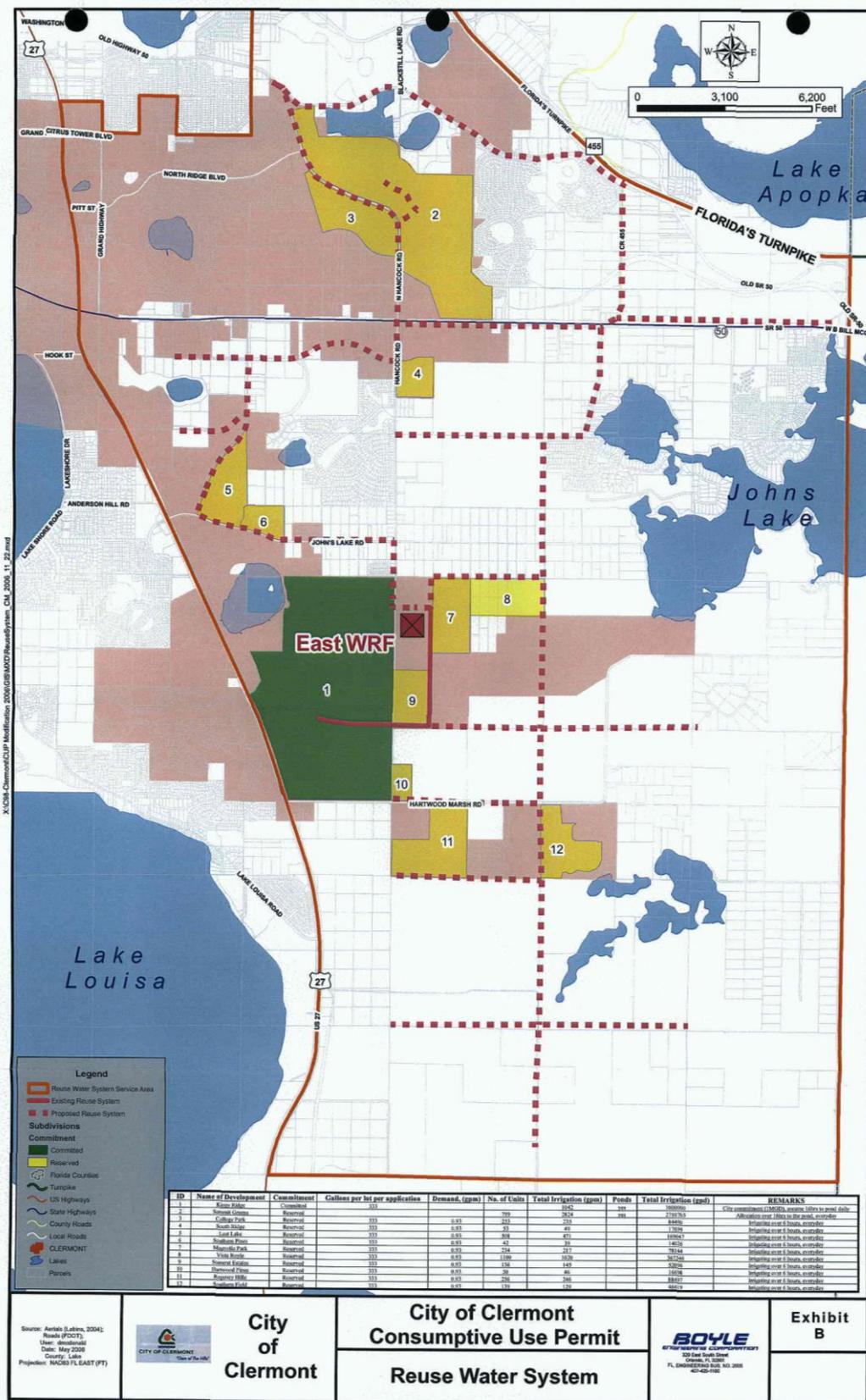
The facility's reuse land application consists of an existing 0.75 mgd AADF permitted capacity slow-rate restricted public access system (R-001), which consists of a 17-day polishing pond that discharges to the spray-field located approximately at latitude 28° 32' 42" N, longitude 81° 48' 30" W.

Table 11: Permitted Major Reclaim Water Users (0.1 mgd or greater)

User Name	User Type	Capacity (mgd)	Acreage
Kings Ridge Golf Course	Golf Courses	1.00	533
South Lake Hospital	Other Landscape Irrigation	0.70	150
Triathlon Training Center	Other Landscape Irrigation	0.70	165
Lake-Sumter Community College	Other Landscape Irrigation	0.40	90
Summit Greens	Residential Developments	0.27	243
Summit Greens Golf Course	Golf Courses	2.44	225
Lost Lake	Residential Developments	0.17	350
Villages at East Lake	Residential Developments	0.10	25
Heritage Hills	Residential Developments	0.37	190
Totals		6.15	1,991

Source: City of Clermont Utilities Department, 2008

Figure 2: City of Clermont Reuse Water System



Source: Boyle Engineering, City of Clermont Consumptive Use Permit, 2009

D. CURRENT AND PROJECTED SUPPLY AND DEMAND⁹**5. Historic Water Demand**

The City of Clermont reported a 2006 average annual daily demand (AADD) of 6.49 mgd, based on a service population of approximately 31,553 which corresponded to a per capita usage of 206 gallons per capita per day (gpcd). **Table 12** shows the historic water use and five-year average for 2002-2006.

Table12 – City of Clermont Historic Water Use

Year	Combined East-Side and West-Side Potable Water Systems		
	Service Area Population	Gallons Per Capita Per Day	AADD (mgd)
2002	19,722	201	3.97
2003	24,371	168	4.08
2004	27,504	187	5.16
2005	29,851	174	5.20
2006	31,533	206	6.49
Average		187	4.98

Source: Boyle Engineering, Response Letter to CUP #2478 RAI #1 dated February 21, 2007, Table 3c.

6. Population Projections and Future Water Demand

The City projects a water service population of approximately 47,446 by 2020 based on committed, reserved, and future land use within the City's potable water service area. Build-out population requires a projected 2020 AADD of 10.321 mgd based on 185 gpcd. **Table 13** shows the projected water use from 2010 to 2020.

⁹ Boyle Engineering, *City of Clermont 2006 CUP Modification Application*, January 2006

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Table 13 – Needs and Sources Assessment for the Combined East- and West-Side Potable Water Systems

Year	Projected City of Clermont Population ¹ (City Limits)	Lake Utility Services, Inc.		Projected Service Area Population	Projected Total Demand (mgd)	Water Conservation Offset (mgd)	Projected Reclaimed Water Contribution (mgd)	Projected Alternative Water Supply Contribution (mgd) ⁵	Adjusted Total Demand (mgd)	Combined Groundwater Sources/CUP Allocations (mgd)	Total Alternative Water Supply Required (mgd)
		Portion of City Population Served ²	Estimated Potable Water Demand (at 260 gpcd) ^{3,4}								
2009	24,199	1,751	0.46	37,418	7.925	1% (0.11)	2.67	0.00	5.15	7.37	0.00
2010	27,965	1,849	0.48	39,536	8.59	2% (0.19)	2.77	0.00	5.63		0.00
2011	29,660	1,946	0.51	40,793	8.907	3% (0.28)	2.89	0.00	5.74		0.00
2012	31,355	2,044	0.53	42,051	9.210	4% (0.38)	3.00	0.00	5.83		0.00
2013	33,050	2,142	0.56	43,308	9.5	5% (0.49)	3.11	0.00	5.90	6.14	0.00
2014	34,745	2,239	0.58	44,566	9.778	6% (0.61)	3.22	0.13	5.82		0.00
2015	36,441	2,239	0.58	45,823	10.042	8% (0.61)	3.34	0.27	5.82		0.00
2016	38,049	2,239	0.58	46,148	10.034	9% (0.61)	3.37	0.29	5.76		0.00
2017	39,657	2,239	0.58	46,472	10.023	10% (0.61)	3.40	0.31	5.70		0.00
2018	41,265	2,239	0.58	46,797	10.122	10% (0.61)	3.42	0.35	5.74		0.00
2019	42,873	2,239	0.58	47,121	10.222	10% (0.61)	3.45	0.39	5.77		0.02
2020	44,480	2,239	0.58	47,446	10.321	10% (0.61)	3.48	0.42	5.81		0.09

¹ Based on the population projections from the City's 2009 Comprehensive Plan update, adopted June 23, 2009

² Based on City of Clermont residential sanitary sewer connections, Legends and Foxchase subdivisions, applying a five-year buildout and a pph factor of 2.17.

³ Gallons per capita per day (gpcd) was determined from CUP records for the LUSI North Service Area, per Table 2 submitted to SJRWMD in May 2008

⁴ LUSI is currently in the CUP modification process with the SJRWMD. The demand associated with water service to the City of Clermont has been accounted for in the projections submitted to the SJRWMD and currently under review.

⁵ The source for alternative water supply for years 2014-2020 is the St. Johns River-DeLand project.

Source: Boyle Engineering, *City of Clermont Consumptive Use Permit (CUP) Application #2478*, January 2007; Response Letter to RAI #2 dated December 11, 2008; City of Clermont, July 2009

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E. POTENTIAL FUTURE SOURCES OF POTABLE WATER

1. Groundwater

Groundwater, a traditional water source, is currently the main potable water supply in the City of Clermont and in Lake County, with the Upper Floridan Aquifer being the main source for public supply. SJRWMD anticipates that the development of future groundwater projects will be minimal due to existing stresses on groundwater availability, which will cause a shift from traditional to alternative water supplies. Please see Section F for a discussion of the City's strategy for groundwater use.

The Lower Floridan Aquifer typically contains lower quality or brackish water, which does not meet potable standards due to its higher mineral content, although it is of higher quality in some areas of Lake County. The removal of dissolved solids to meet potable water standards results in relatively higher treatment costs than the costs of treating fresh groundwater to meet potable water standards, and thus will impose additional considerations to development as a future water supply due in part to concerns with disposal of the mineralized by-product or concentrate.

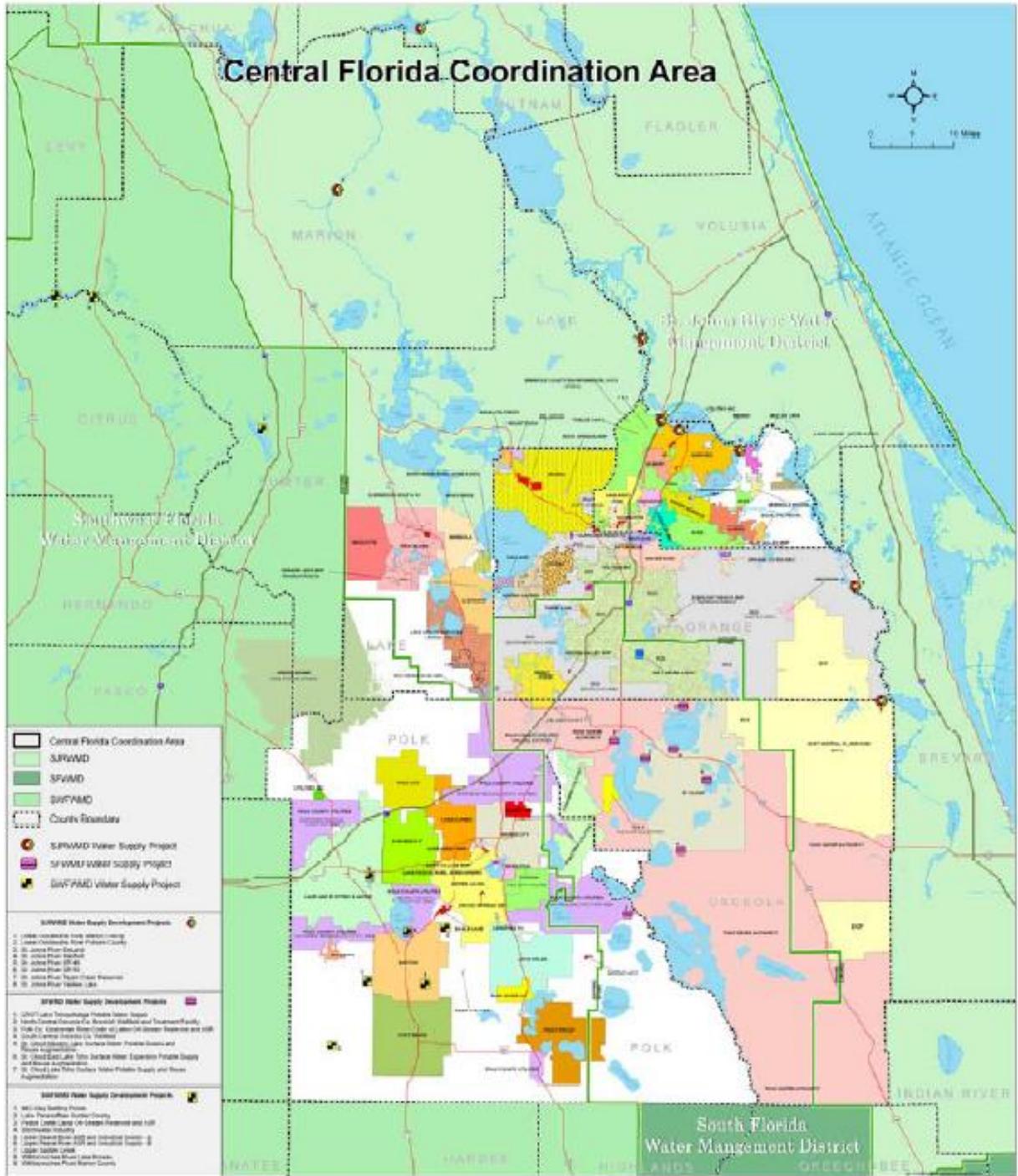
Based on the primary use of the Upper Floridan Aquifer for water supply, the apparent absence of an effective confining layer between the Upper and Lower Floridan aquifers throughout much of Lake County indicates that Lower Floridan Aquifer withdrawals would generally affect the potentiometric surface of the Upper Floridan Aquifer. As a result, Lower Floridan Aquifer withdrawals would have a similar impact to surface water features as Upper Floridan withdrawals and would contribute to pending groundwater resource limitations. Because of these factors, the Lower Floridan Aquifer is not considered to be a viable water supply source.

In January 2008, the South Florida, Southwest Florida and St. Johns River water management districts issued the "Central Florida Coordination Area Planning Work Group Final Report." In 2006, the three water management districts jointly concluded that "...the availability of sustainable quantities of ground water in central Florida is insufficient to meet future demands and that alternative water supply sources must be developed to meet increased demands in central Florida beyond 2013." The districts identified the Central Florida Coordination Area (CFCA, **Figure 3**) as the area for which a coordinated and consistent approach to addressing the identified water supply issues would be developed and implemented. The governing boards of the districts approved the action plan for the central Florida coordination area to guide the coordinated and consistent regional approach to water supply planning.

2. Surface Water

Surface water sources are not currently utilized for potable water supply in the City or in Lake County. Relative to groundwater supplies, utilization of surface waters for potable supply entails more sophisticated and costly means of treatment, management of variability in supply quantity and quality, and management of the associated environmental impacts to downstream ecology and water resources. However, as the City, Lake County and the region continue to grow, and the use of groundwater becomes more restricted, the need for regional alternative surface water supplies will become an important element of the City's future growth.

Figure 3: PWS Service Areas and Potential AWS Development Projects in the CFCA



Source: CFCA Planning Work Group Final Report, January 2008

In addition to these considerations, Minimum Flows and Levels (MFLs) will dictate the viability of water supply from surface water bodies and groundwater by imposing limits to withdrawals. Two principal surface water systems have been identified for the work plan as major potential water supply sources: the Ocklawaha River and the St. Johns River. Please see Section F for a discussion of the City's strategy for surface water use.

3. Reclaimed Water

Reclaimed (reuse) water is characterized as a current and future non-potable alternative water source in this work plan. SJRWMD typically seeks to achieve a water resource benefit with reclaimed water by:

- Using readily available reclaimed water in place of higher quality water for uses that do not require higher quality, as required by SJRWMD permitting criteria; and
- Using reclaimed water to augment water supply sources.

Reuse water can be applied in a number of ways to decrease reliance on traditional water supplies, including golf course irrigation; landscape / residential irrigation; industrial use, and others. The East WRF in the City of Clermont has a capacity of 4.0 mgd and is currently providing 100% of its flows for reuse or rapid infiltration applications.

4. Demand Reduction (Water Conservation)

Water conservation is an essential, cost effective element of water supply planning that allows for management of both existing and future water demands without requiring major capital outlays. Water conservation (demand reduction) is an important component of the work plan, in that it can extend availability of traditional and alternative future water supplies.

A myriad of conservation elements or best management practices (BMPs) may be applied within a conservation program. These generally fall within the categories of watering restrictions, pricing incentives (inverted rate structures), metering, structural (plumbing and landscape) measures, and education. Watering restriction enforcement, inverted rate structures, education programs, and conservation coordinators are some of the broad, effective elements of a comprehensive conservation program for a municipality or community. Please see Section F for a discussion of the City's strategy for water conservation.

5. Stormwater

Stormwater as discussed in the context of this work plan is usually not identified as a water supply source per se, since water supply plans tend to focus on the larger supplies available in surface waters. However, stormwater is commonly utilized as a supplemental non-potable water supply source. Please see Section F for a discussion of the City's strategy for stormwater as a reuse water resource.

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F. WATER SUPPLY STRATEGY

This section provides a summary of the water sources which are being pursued by the City of Clermont for meeting future water needs. These water supply sources include groundwater, surface water, reclaimed water for non-potable uses, water conservation and stormwater. Groundwater, reclaimed water, and water conservation are currently being used by the City. Surface water and stormwater have not been previously used by the City but are also under consideration as alternative water supply sources.

As identified in *Technical Publication SJ2006-2C, St. Johns River Water Management District, District Water Supply Plan 2005, Third Addendum*, dated May 13, 2008, the SJRWMD District Water Supply Plan includes a number of alternative water supply projects. The City of Clermont has elected to pursue the “St. Johns River near DeLand Project” as an alternative water supply source. Since this project is consistent with the District Water Supply Plan, it is approved under the SJRWMD’s plan. Additionally, this project is included in the City’s recently drafted water supply notification response submitted to SJRWMD.

The following sub-sections provide a description of the City’s proposed water supply strategy, including a summary and discussion of each water supply source.

1. Groundwater

All existing Clermont water supply wells and the associated water withdrawals are permitted by SJRWMD. For purposes of this work plan, it is assumed that all existing City water supply wells will remain in service for the remaining term of the City’s current CUP and that the City will continue to optimize its groundwater resources based on the constraints outlined in the CUP. The City has requested additional groundwater allocation, which can be seen as an interim measure until the “St. Johns River near DeLand Project” (described in subsection 2) comes online and provides an alternative source.

2. Surface Water

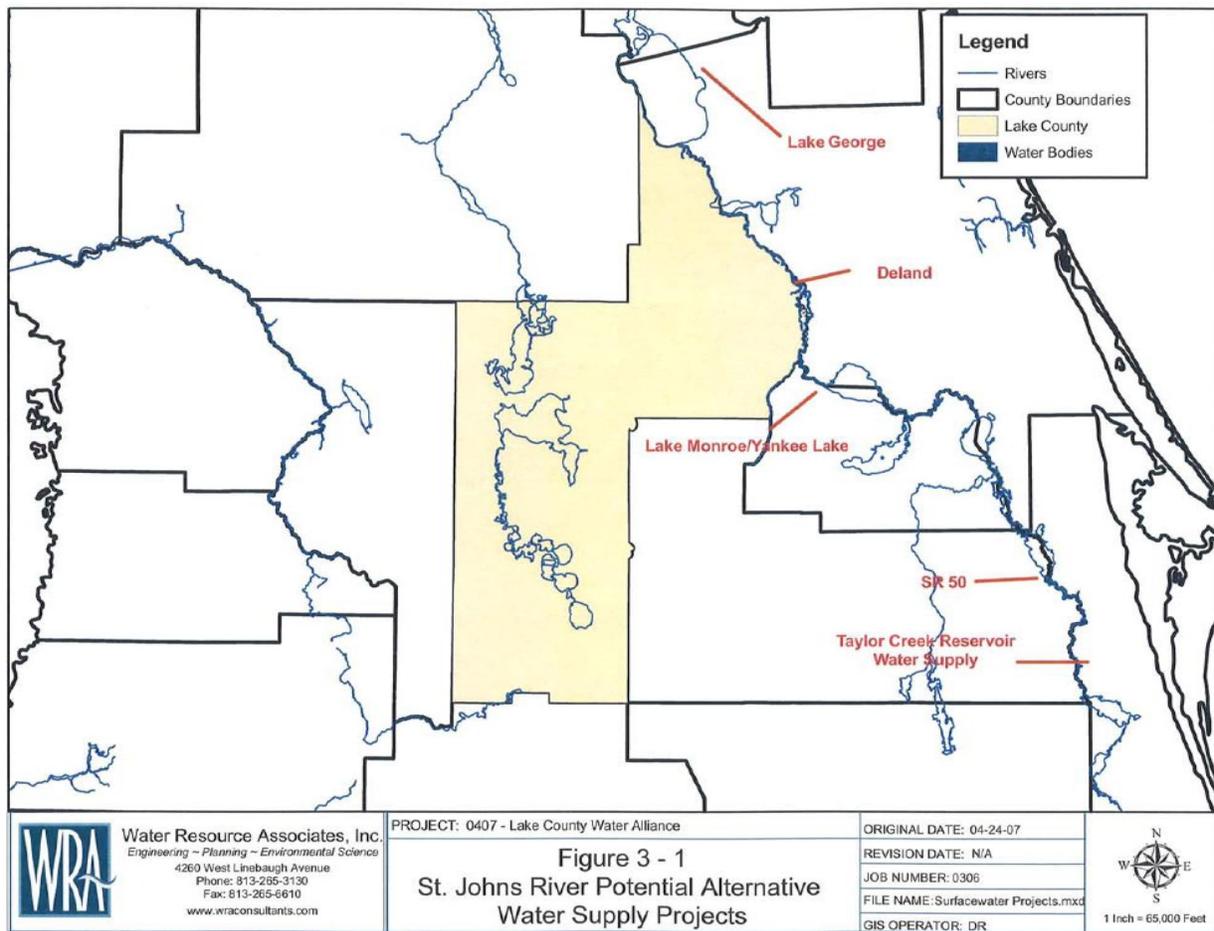
The fourth addendum of the 2005 SJRWMD District Water Supply Plan (DWSP) was approved by the SJRWMD governing board on May 12, 2009. The DWSP reviewed the water availability, reliability, and quality of the St Johns River to determine the feasibility of withdrawing surface water to meet future needs in identified priority water resource caution areas. Through this on-going alternative source development program, SJRWMD has established that the St. Johns River can supply a large quantity of raw water that will vary in water quality and quantity based on the selected withdrawal locations and established Mean Flow Levels (MFLs) for various river segments.

While the water quantity is significant, surface water sources typically have more variability in both quantity and quality than groundwater sources. As stated in the DWSP, “surface waters tend to contain silts and suspended sediments, algae, dissolved organic matter from topsoil, and chemical and microbiological contaminants from municipal wastewater discharges, stormwater runoff, and industrial and agricultural activities. The quality of surface water may vary seasonally with variation in flow rates or water levels.” Therefore, the treatment costs for a potable surface water supply are significantly higher than groundwater. In addition, the St Johns River water quality during low flow periods is slightly-to-moderately brackish. Consequently, the typical fresh surface water treatment methods are even more elaborate (i.e. membrane technology and concentrate management) than a fresh surface water source and treatment costs can increase by 75% to 100% over conventional surface water processes.

The SJRWMD DWSP (2005) identified five surface water alternative locations along the St. Johns River. **Figure 4** shows the general location of each of these projects listed below.

- St. Johns River near SR 50 Project
- St. Johns River near Lake Monroe Project (Yankee Lake)
- St. Johns River near DeLand Project
- St. Johns River near Lake George Project
- St. Johns River/Taylor Creek Reservoir Water Supply Project

Figure 4: St. Johns River Alternative Surface Water Projects



The St. Johns River near DeLand project is the surface water project most likely to provide a potable water alternative source to the City of Clermont. This alternative includes construction of a river intake, raw water pump station, off-line stage reservoir and a pipeline to convey the raw water from the river to a new treatment facility that would supply Lake County and some of its municipalities with potable water needs.

This alternative has been characterized by SJRWMD as the following:

- Potentially Available Water Quantity – 94 to 127 mgd (Does not consider existing St. Johns River allocations for the cities of Melbourne and Cocoa Beach)
- Water quality – poor with costly treatment for brackish water needed

- Intake location in area of Deland (northeast Lake County boundary)
- Off-line storage reservoir needed
- Transmission lines could run from intake to Mount Dora (about 18 miles) and then to Lake County's distribution system (total distribution system approximately 74 miles)
- Key cost elements:
 - Treatment capital and O&M cost high – Conventional surface water plus membrane treatment
 - Transmission system capital cost moderate

The City of Clermont may participate in the planning and design of this facility and may also participate in the funding of the project if feasible. This project is included in the Five-Year Schedule of Capital Improvements (see **Table 14**).

3. Reclaimed Water

In an effort to reduce the use of potable water sources for landscape irrigation purposes, the City has been actively implementing the use of reclaimed water. The City has completed the expansion of the East Water Reclamation Facility (EWRF) which brings capacity of the plant to 4.0 MGD. The facility includes processes designed to produce high quality reclaimed water suitable for use as irrigation water. The West Pollution Control Facility is under construction to convert the plant to a master pump station which will redirect wastewater to the EWRF for treatment to reclaimed water standards. The project will be complete by Fall 2009 and will provide approximately 2.5 MGD of reclaimed water for irrigation use with an ultimate design capacity of 8.0 MGD.

1. Demand Reduction (Water Conservation)

Conservation is an important element of the City's water supply strategy because a reduction in total water consumption reduces demand. An aggressive program to reduce per capita consumption can extend the ability of the utility system to serve additional customers. The City of Clermont has been proactive in the implementation of a conservation program as required in its current CUP. At this time, the City has set a goal of reducing its overall water demand by 10% through its ongoing conservation efforts and the demand projections included in the CUP RAIs reflect this goal.

The following sub-sections detail the City's on-going water conservation efforts.

a. Mandatory Water Restrictions

Watering a lawn is only allowed twice a week from 4 p.m. to 10 a.m. The City maintains a hotline to anonymously report water restriction abuses. Irrigation violations are tracked and enforced as a code violation, and repeated offenses are punishable through the Code Enforcement Board.

b. Conservation Demand Reduction Initiatives Pursuant to the City's CUP #2478

- Water audits
- Meter surveys
- Customer and employee conservation education program
- Televised water conservation public service announcements

- Provide water conservation videos to local schools and community organizations
- Construct, maintain and publicize water-efficient landscape demonstration projects
- Provide water conservation exhibits in public places such as festivals, utility offices and government buildings
- Provide/sponsor water conservation speakers to local schools and community organizations
- Provide water conservation articles and/or reports
- Display water conservation posters and distribute literature
- Provided water conservation information to customers regarding landscape irrigation, including the requirements contained within Rule 40C-2.042, F.A.C.

c. Water Conservation Rate Structure

The City implemented a water conservation promoting rate structure in 2000 and revised it in 2002. The rate structure includes several tiers developed to encourage water conservation by increasing the charge for water usage for higher consumption. An irrigation rate structure was also developed which does not charge sewage fees, but begins at a higher charge for water usage beyond that of household demands.

d. Water Efficient Irrigation and Landscape Ordinance

The City adopted Ordinance 336-C, Water Efficient Irrigation and Landscape Ordinance, on April 13, 2004. This ordinance establishes minimum standards for landscape and irrigation design that recognizes the City's climate, soils, water resources, land uses and watershed resource planning. The ordinance requires the preservation of existing plant communities, the use of site-specific plant materials, the use of pervious paving materials, the use of water-efficient irrigation and other environmentally-sensitive site development concepts and best management practices.

Lake Utilities Services, Inc. (LUSI) also has a water conservation plan that was submitted with their request to modify CUP #2700.

2. Stormwater

The City has identified a potential stormwater capture and reuse project and bulk reclaimed water storage pond. The City has retained the right to line and use a stormwater pond with excess capacity in the range of 10 to 20 million gallons available for storage. The City is considering using the pond to store reclaimed water during wet weather or low demand periods, store reclaimed water purchased in bulk quantities from other utility providers and collect and reuse stormwater flows to supplement reclaimed water supplies.

G. WATER SUPPLY FACILITIES WORK PLAN

The City of Clermont incorporated numerous objectives and policies into its recently updated comprehensive plan (adopted June 23, 2009) that relate to protection and conservation of water sources and water supply. These objectives and policies are incorporated into the Future Land Use, Conservation, Potable Water, Sanitary Sewer, Stormwater Management, Intergovernmental Coordination and Capital Improvements elements. The comprehensive plan will be amended to adopt this work plan as an appendix to the Potable Water Element (PWE), thereby establishing the connection between the goals, objectives and policies of the PWE.

The City has also developed a capital improvement plan and established a schedule for implementation for City-wide projects. Not included in the City's Capital Improvement Schedule is the \$700,000 the City budgets on an annual basis for ongoing repair and upgrades of the existing water and wastewater facilities to maintain these systems at a high performance level. Based on the needs identified in this work plan, the City has been able to identify funding within the next five years to address improvements needed to provide sufficient water supplies throughout the 10-year timeframe of this plan.

1. Five-Year Capital Improvement Schedule

Referenced in **Table 14** are the five-year capital improvements projects for the City of Clermont potable water and reclaim water system, including the source(s) of funding.

2. Long-Term Capital Improvements Work Plan Program

Referenced in **Table 15** are the 10-year capital improvements projects for the City of Clermont potable water and reclaim water system, including possible sources of funding.

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Table14: Five-Year Capital Improvements Work Plan Program

Water Supply Strategies	Source of Funding	FY 08-09	FY 09-10	FY 10-11	FY 11-12	FY 12-13
GROUNDWATER						
Water Main Extension (ongoing project extending water mains to complete loops in the system, primarily on the east side system, and improve system hydraulics and reliability)	Water Impact Fees	\$250,000	\$500,000	\$500,000	\$500,000	\$500,000
West-Side Water Treatment Plant (construct 1-million gallon storage tank, a bank of high-service pumps, a disinfection system, a new potable well and abandonment of the Seminole well)	Utility Fees	\$1,700,000	\$3,000,000	\$3,000,000	0	0
Greater Hills Water Treatment Plant (construct 1-million gallon storage tank, a bank of high-service pumps, a disinfection system and a new potable well)	Utility Fees	\$4,200,000	0	0	0	0
Water Main Replacements (ongoing replacement of older water mains to improve system hydraulics and water quality)	Water Fund Operating Budget	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
RECLAIMED WATER						
Supplemental Irrigation System Well (construct groundwater well to supplement reclaimed water supply during peak demand to area north of SR 50 and shift demand from potable system to reclaimed water system)	Utility Fees	\$2,750,000	\$600,000	\$500,000	\$500,000	\$500,000
Reclaimed Water System Expansion (expansion includes piping extensions to deliver reclaimed water to developments plumbed to accept reclaimed water north and south of SR 50 and shift demand from potable system to reclaimed water system)	Sewer Impact Fees and Utility Fees	\$2,845,000	\$300,000	\$500,000	\$500,000	\$500,000
East Water Reclamation Facility Plant Expansion Phase II (increases treatment capacity from 2.0 mgd to 4.0 mgd, includes the decommissioning of the West Plant and rerouting of flows to the East Plant , also facilities for reclaim water distribution such as 2.0 mgd storage tank and bank of high service pumps)	Sewer Impact Fees	\$10,339,000	0	0	0	0
ALTERNATIVE SOURCES						
Alternative Potable Water Source (funding for FY 08/09 and FY 09/10 is for the planning/design of AWS projects to extend future potable water supply needs – after 09/10 the funds shown are allocated for construction of the selected project or projects); however, the City intends to stay within its groundwater allocations by using reclaimed water to supplement water supply to meet overall demand.	Utility Fees and Water Impact Fees	\$1,200,000	\$250,000	\$500,000	\$500,000	\$500,000
PROJECT TOTALS		\$25,530,000	\$6,696,000	\$6,500,000	\$19,371,000	\$3,000,000

Source: *City of Clermont Comprehensive Plan 2009-2020*, Adopted Five-Year Schedule of Capital Improvements

Table15: Ten-Year Capital Improvements Work Plan

Water Supply Strategies	Possible Sources of Funding	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18
RECLAIMED WATER						
East WRF Plant Expansion				\$20,000,000		
ALTERNATIVE SOURCES						
St. Johns River at Deland Surface Water Project			\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000
PROJECT TOTALS			\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000

Source: City of Clermont, 2009

3. Potential Funding Sources

In an effort to mitigate pending water shortages, SJRWMD has set aside funding for municipalities and counties within their jurisdiction who are developing alternative water supply projects as noted below. Also, the Florida Department of Environmental Protection (FDEP) has several programs available to provide non-emergency financial assistance to local governments and certain other entities to upgrade, expand, or build new wastewater, stormwater, and drinking water facilities.

a. SJRWMD Water Protection and Sustainability Program

SJRWMD initiated the Water Protection and Sustainability Program (WPSP) in 2006 to provide cost-share funding for construction of alternative water supply projects.

Program highlights:

1. Cost-share funding is available for alternative water supply projects identified in the District Water Supply Plan 2005
2. Emphasis is on multi-jurisdictional, regional projects

SJRWMD will match state funds for construction costs only:

1. 20 percent for reclaimed water
2. 30 percent for surface water augmentation
3. 40 percent for new source public supply

SJRWMD goal:

1. Cost-share funding for projects that have the greatest certainty to supply projected water needs through 2025 such that:
2. The WPSP solves water supply problems in water use caution areas and
3. Identification of new priority water use caution areas are avoided

SJRWMD priorities for funding:

1. Large projects that provide significant quantities of new sources of water to address projected regional water demands
2. Smaller projects ready to go that help sustain current supplies and extend the time until larger projects are completed

b. FDEP Clean Water State Revolving Fund (SRF)

The SRF is a loan program provides low-interest loans to local governments to plan, design, and build or upgrade wastewater, stormwater, and non-point source pollution prevention projects. Certain agricultural best management practices may also qualify for funding. Discounted assistance for small communities is available. Interest rates on loans are as much as 40% below market rates.

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