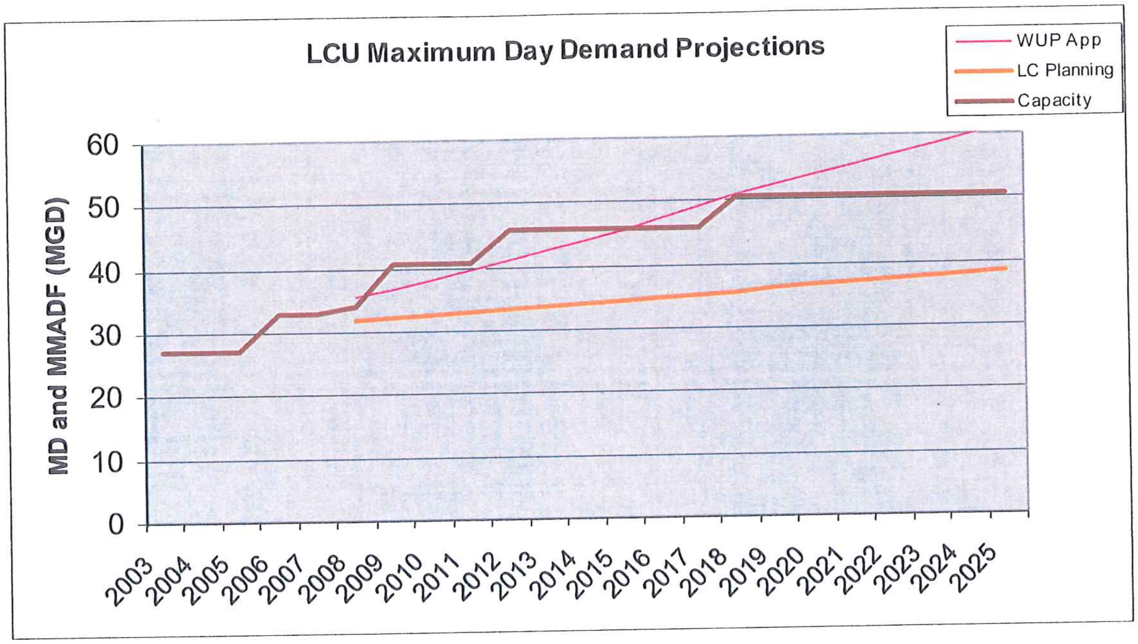


In the graph above the magenta line represents a projection of the maximum month daily average demand as calculated in support of a water use permit application submitted by LCU. The thick Orange line represents the maximum daily demand as calculated utilizing the population projection provided by the Lee County Planning Department. The projection performed during the SFWMD Lower West Coast Water did not consider maximum month or maximum daily demands. The thick purple line depicts capacity development planned by LCU. Capacity development is summarized in the next section.

The projections performed for the water use permit and the Lower West Coast Water Supply Plan are shown for informational purposes only. The projection performed by the Lee County Planning Department will serve as the official projection for purposes of demonstrating that LCU has planned and programmed sufficient capacity development projects to meet projected demands.

3.5 SUMMARY OF CAPACITY DEVELOPMENT

As shown in previous sections LCU is at various stages of capacity development at several of its facilities. The following is a summary of these plans for developing capacity.

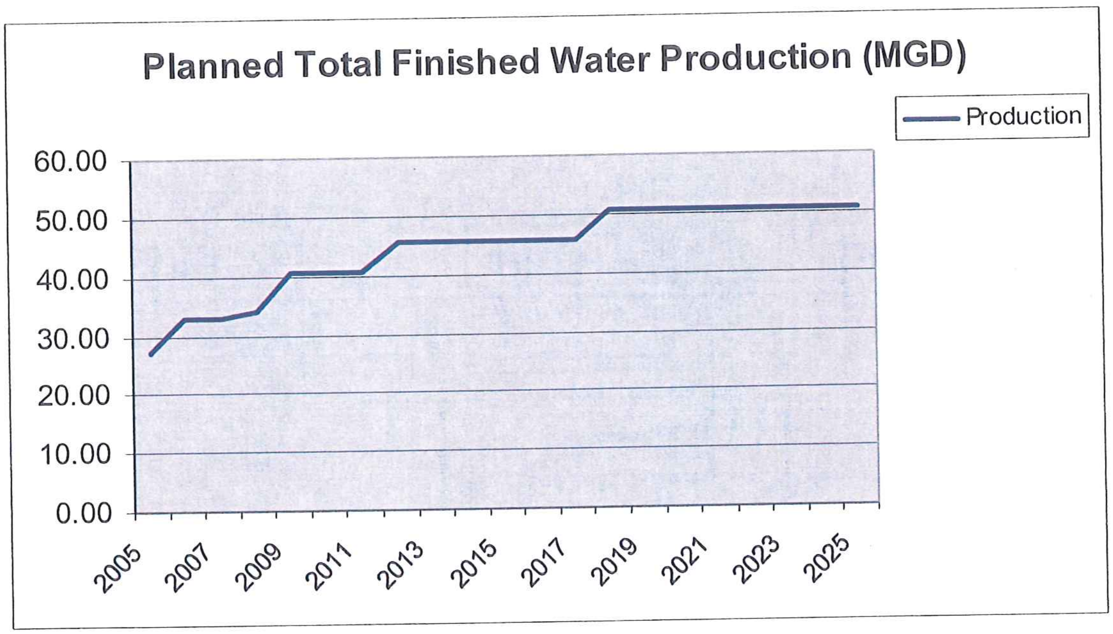
<u>2009</u> - Regain capacity of the North Lee County Wellfield from 3.50 mgd to 5.0 mgd and complete Corkscrew Wellfield expansion to 15.0 mgd. This represents an increase in capacity of **<u>6.5 mgd</u>**.

<u>2012</u> - Complete expansion of North Lee County Water Plant and Wellfiled to increase capacity from 5.0 mgd to 10.0 mgd. This represents an increase in capacity of **5.0 mgd**.

2016 - Complete Green Meadows Water Plant and Wellfield expansion increasing capacity from 9.0 mgd to 16.0 mgd and complete expansion of Olga Water Plant from 5.0 to 10.0 mgd. Potential sources for expansion at Olga are presently being studied. This represents an increase in capacity of **12.0 mgd**. This increase in capacity is not reflected in the analysis as a water use permit for Green Meadows expansion has not been issued yet and the two projects are not included in the current CIP.

2018 – Complete expansion of Corkscrew WTP and associated wellfield from a capacity of 15.0 mgd to 20.0 mgd representing an increase in capacity of **5.0 mgd**

The graph below depicts the increases in total system capacity as a result of these planned expansions as well as those increases in capacity that were completed between 2005 and 2008. The planned capacity shown on this graph is also shown as a dark purple line on the previous two graphs along with the projected demands.



3.6 SUMMARY

The above graphs and tables show the projected annual average and maximum demands from various planning efforts. They also show LCU's planned capacity development. LCUs planned capacity in 2018 is 50.63 mgd. The Lower West Coast Water Supply Plan projected annual average daily demand in 2018 is 31.08 mgd. The 2018 maximum day demand projection based on the Lee County Planning Department's population projection, the official projection being utilized by this plan, is 35.65 mgd. Therefore, the analysis demonstrates that LCU is planning and has programmed in the approved CIP, projects sufficient to meet the maximum day demand in 2018 as projected by the Lee County Planning Department, the official projection being utilized for this water supply facility work plan.

3.7 LEVEL OF SERVICE

The adopted level of service for potable water in the Lee County Comprehensive Plan is 250 gallons per day per Equivalent Residential Connection (ERC) for peak month, except that facilities serving only mobile home residential structures must have a capacity of 187.5 gallons per day and facilities serving only travel trailer residential structures must have a capacity of 150 gallons per day.

An analysis to determine if the current level of service in the Lee Plan is appropriate was performed. Utilizing billing records, the total number of ERC's in the LCU system in May 2007 was determined. The records indicated that a total of 143,291 ERC's existed in May 2007. Utilizing the population served in 2007 determined by the Lee County Planning Department of 230,581 people the persons per ERC was determined to be 1.44 people per ERC. Utilizing the maximum day per-capita consumption of 137.58 which was derived from actual maximum day demand in 2007 and the existing population determined by the Lee County Planning Department the gallons per day per ERC was calculated to be 198.12 gpd/ERC. It should be noted that the number of ERU's used for this analysis represents the total number of ERC's connected to the system not necessarily the number of ERU's actually in use at that time.

In addition to the calculation performed above it was determined from billing records that in May 2006 there were 59,226 single family residential accounts that were billed for usage. The total monthly number of gallons metered for these accounts was 442,533,000 gallons. These figures result in a consumption of 241.08 gpd/residential connection. This figure does not represent the total amount of finished water required as there is a certain amount of water loss within the water distribution system. In May 2006 this percentage of loss was calculated to be 3.62%. Therefore, adding the May 2006 unaccounted for water percentage of 3.62% to this figure yields a use rate of 249.75 gpd/residential connection.

The analysis performed above supports the current adopted Level of Service for potable water in the Lee Plan.

WATER SUPPLY FACILITIES WORK PLAN
LEE COUNTY UTILITIES
LEE COUNTY, FLORIDA

Section 4
PROPOSED FACILITIES

4.1 PROPOSED WATER SUPPLY SOURCES

4.1.1 Olga Surface Water Intake

Two additional pumps are permitted by the SFWMD and are part of a planned expansion of the facility (see Table 9). This expansion would increase the current capacity of 5.0 MGD to 10.0 MGD. This planned increase in capacity is not included in the analysis to demonstrate sufficient capacity or included in the CIP as LCU is currently in the processes of determining the feasibility of expanding capacity at the Olga facility.

An additional 3 ASR wells are permitted by the SFWMD for this facility (see Table 10). They are planned to be installed during the plant expansion. The existing and proposed ASR wells along with the plant expansion at the Olga plant will provide seasonal storage of water. This will allow for maximizing withdrawals during high river flows in the rainy season and minimizing the withdrawal from the river during low flows in the dry season, thereby aiding in the recovery of a MFL water body, the Caloosahatchee River. The ASR program at this facility is on hold due to permitting issues regarding Arsenic. LCU anticipates this issue will be resolved shortly and the program can progress.

LCU is also conducting a study to identify additional raw water supply alternatives for this facility. Potential supply options being studied include both traditional and alternative sources.

4.1.2 Corkscrew Wellfield

An expansion of the Corkscrew Treatment Plant was completed in 2006. The expansion increased the treatment capacity of the facility from 10.0 MGD to 15.0 MGD. The wellfield expansion project associated with the plant expansion is currently under construction and is expected to be completed by the end of 2008. The wellfield expansion includes the addition of 25 wells which are currently permitted by the SFWMD. Eleven of these wells will withdrawal water from the Sandstone aquifer, eleven will withdrawal water from the Surficial aquifer and three will withdrawal water from the Lower Hawthorn aquifer. The overall objective in the design of this expansion is to widen the aerial extent of the wellfield, while maintaining the same amount of withdrawal from the Surficial aquifer. This should spread out the withdrawal to minimize the drawdown in the Surficial aquifer surrounding the wellfield (See Figure 5). In addition LCU is developing 2 Lower Hawthorn aquifer wells to augment raw water supplies from traditional sources. An expansion of the treatment plant and wellfield to 20.0 MGD is planned and programmed into the CIP for years 6-10.

4.1.3 Green Meadows Wellfield

LCU's current water use permit for this facility allows for an expansion of the wellfield including the installation of 21 new wells. The permit allows for the installation of nine Surficial aquifer wells, nine Sandstone aquifer wells and three Lower Hawthorn wells.

Instead, LCU proposes to construct a new 16.0 mgd reverse osmosis (RO) water treatment plant to replace the aging existing lime softening treatment system currently permitted for 9.0 mgd at this site. Additional withdrawals of brackish water from the Lower Hawthorn aquifer along with current withdrawals from Surficial and Sandstone aquifers will be blended and treated in the new facility. An increase in allocation from traditional fresh water sources currently permitted is not proposed. Fourteen new Lower Hawthorn wells located in LCU's existing easement are proposed to increase the capacity of the wellfield (see Figure 6). A Lower Hawthorn pilot/production well is currently under construction and an application to modify LCU's current water use permit has been submitted. This planned increase in capacity is not included in the analysis to demonstrate sufficient capacity or programmed in the CIP as LCU is currently in the processes of determining the feasibility of expanding capacity at the Green Meadows facility and the water use permit related to this increase in capacity is under review.

4.1.4 Pinewoods Wellfield

An expansion of the Pinewoods Wellfield was completed in 2007. See the section addressing existing water supply resources and treatment facilities for a description. The expansion increased the utilization of the Lower Hawthorn aquifer and did not increase the use of traditional fresh water aquifers. Utilizing the Lower Hawthorn aquifer instead of the fresh water aquifers allowed for expansion while relieving some of the stress placed on traditional sources.

4.1.5 North Lee County Wellfield

As mentioned in a previous section, this wellfield has lost production since being placed into service in August 2006. The finish water production has been lowered from 5.0 mgd to a sustainable yield of 3.5 mgd. This loss in production was caused by interference between wells caused by the current configuration of the wellfield and well spacing. The first phase of wellfield expansion for this facility will involve regaining the capacity to produce 5.0 mgd. Three new Lower Hawthorn wells are proposed to be constructed off-site. The wells will be spaced farther apart that the existing wells and a linear configuration will be employed. These three wells should allow LCU to regain the 5.0 finish water capacity as originally intended. LCU expects to complete this project by 2009.

The North Lee County Water Treatment Plant was designed to be easily expandable to 10.0 mgd. The second phase of expansion for this facility will involve expansion of the treatment plant to 10.0 mgd. An associated expansion of the wellfield is also proposed. Seven additional Lower Hawthorn Wells will be required to provide sufficient raw water to produce the additional 5.0 mgd of finished water. Phase II of the wellfield expansion and expansion of the treatment facility is expected to be completed by 201~~3~~2. See Figure 11 for the proposed configuration of this wellfield.

4.2 PROPOSED MODIFICATIONS TO CONSUMPTIVE USE PERMITS

4.2.1 Permit # 36-00003-W

LCU has recently submitted an application to renew/modify Consumptive Use Permit number 36-00003-W covering the Corkscrew, Green Meadows wellfields as well as the surface water withdrawal at the Olga facility. LCU is requesting the following in the application:

- Continued use, at the current allocation, of surface water from the Caloosahatchee River (C-43), and fresh groundwater from the Sandstone, Surficial, and Water-table aquifers.
- An increase in annual allocation from the Lower Hawthorn (Upper Floridan) aquifer at the Green Meadows Wellfield to 2,471 MG.
- An increase in maximum monthly allocation from the Lower Hawthorn (Upper Floridan) aquifer at the Green Meadows Wellfield to 322.4 MG.

The increase in allocation from the Lower Hawthorn aquifer will allow LCU to operate the proposed Green Meadows R.O. Treatment facility at full capacity (16.0 mgd) without exceeding current fresh water withdrawal limits (see Proposed Water Resources, Green Meadows wellfield above). It should be noted that due to a supply deficit in the last few years, LCU has been operating the water distribution system at lower pressure than normal to manage the demand in the system. The requested allocation in this permit renewal application was based on a projection that assumed a 10% increase in demand as a result of increasing pressure in the system to acceptable levels.

4.2.2 Permit # 36-00152-W

In addition, LCU has recently submitted an application to modify Consumptive Use Permit number 36-00152-W covering the Waterway Estates and North Lee County wellfields. The requested permit duration is 20 years. The requested modification includes the addition of 10 Lower Hawthorn aquifer water supply wells and an increase in allocation from that aquifer to serve as raw water for the North Lee County Water Treatment Plant. The application requests an annual average daily allocation of 8.808 MGD and a maximum monthly average daily demand of 12.5 MGD. This added allocation will allow LCU to expand the North Lee County Plant to produce 10.0 MGD of finished water.

LCU's requested allocation will provide redundancy allowing for flexibility in source options to meet demands.

The Table below summarizes the proposed water use permits.

PROPOSED LEE COUNTY UTILITIES WATER USE PERMIT SUMMARY

Permit #	Facilities	Expiration Date	Annual Allocation (MGD)	Max Month Daily Allocation (MGD)	Max Day Allocation (MGD)	Source Limits: Source	Source Limits: Limit (MGD)
36-00003-W	Corkscrew Olga Green Meadows Cypress Lake	**Application Submitted**	**28.00**	**40.77**	N/A	Mid-Hawthorne (C.L.) Sandstone Surficial (Corskrew) Surficial (GM)	0.75 8.00 6.00 4.20
36-00122-W	Pinewoods San Carlos	9/9/2014	6.09	7.23	N/A	Surficial (San Carlos) Sandstone (Pinewoods) Surficial (Pinewoods)	2.50 0.75 2.30
36-00152-W	Waterway Estates North Lee County	**Application Submitted**	**8.808**	**12.5**	N/A	Surficial&Mid Hawthorn	1.55
TOTAL			42.898	60.5			

Notes
1. Annual Allocation (MGD) based on Perimtted Annual Total Allocation divided by 365
2. Max Month Daily Allocation (MGD) based on Permitted Max Month Total Allocation divided by 30
3. Max Day Allocation (MGD): Permits no longer specify a Max Day
4. Boldface represents requested increases in allocation

4.3 PROPOSED WATER TREATMENT FACILITIES

4.3.1 Olga Water Treatment Plant

Lee County Utilities plans on expanding the Olga WTP from 5.0 to 10.0 mgd. The primary mode of treatment at this facility will likely change as LCU identifies the various source water options in the study mentioned in the section 4.1.1.

4.3.2 Corkscrew Water Treatment Plant

Lee County Utilities has recently completed an expansion of the Corkscrew WTP from 10.0 mgd to 15.0 mgd. The treatment remains the same as the original plant, which is lime softening followed by filtration. An expansion to 20.0 mgd is planned in 6-10 years.

4.3.3 Green Meadows Water Treatment Plant

Lee County Utilities plans on expanding the Green Meadows WTP from 9.0 mgd to 16.0 mgd. A new low pressure reverse osmosis treatment plant is proposed.

4.3.4 Pinewoods Water Treatment Plant

Lee County Utilities recently completed the 3.0 mgd low pressure reverse osmosis plant at this facility. This added capacity coupled with the original low pressure nano-filtration plant brings the total treatment capacity of this facility to 5.0 mgd.

4.3.5 North Lee County Water Treatment Plant

The new 5.0 mgd North Lee County WTP was completed in August 2006. The facility was constructed for future expansion to 10.0 mgd. This facility is a reverse osmosis facility treating brackish water (Lower Hawthorn). Expansion of the treatment plant from 5.0 mgd to 10.0 mgd will be completed in conjunction with Phase II wellfield expansion and is expected to be completed by 2012.

A table summarizing the water supply development proposed by LCU is shown below.

LEE COUNTY UTILITIES EXISTING AND PROPOSED WATER SUPPLY RESOURCES SUMMARY

EXISTING					PROPOSED				
Facility	**Existing Treatment Capacity (MGD)**	**Existing Source Capacity (MGD)**	**Existing Number of Wells/Pumps**	**Source**	**Facility**	**Proposed Treatment Capacity (MGD)**	**Proposed Source Capacity (MGD)**	**Proposed Additional Wells/Pumps**	**Source**
Olga	5.00	5.00	3	Surface Water	Olga	5.00	5.00		Surface Water
Corkscrew	15.00	10.00	21	Surficial	Corkscrew	20.00	20.00	11	Surficial
			10	Sanstone				11	Sandstone
								3	**Lower Hawthorn**
Green Meadows	9.00	9.00	14	Surficial	Green Meadows	9.00	9.00		
			13	Sandstone					
Cypress Lake	0.00	0.00		Decommisioned	Cypress Lake	0.00	0.00	none	
Waterway Estates	1.50	1.50	6	Surficial	Waterway Estates	1.50	1.50	none	
			11	Mid-Hawthorn					
			1	Lower Hawthorn					
Pinewoods	5.13	5.13	11	Water Table	Pinewoods	5.13	5.13	none	
			3	Sandstone					
			5	**Lower Hawthorn**					
San Carlos	0.00	0.00	4	Water Table	San Carlos	0.00	0.00	none	
North Lee County	5.00	3.50	7	**Lower Hawthorn**	North Lee County	10.00	10.00	**10**	**Lower Hawthorn**
TOTAL	40.63	34.13			TOTAL	50.63	50.63		

BOLD FACE = Proposed and recently developed Alternative Water Supplies

4.4 CAPITAL IMPROVEMENT PLAN

Lee County Utilities' Capital Improvement Plan is summarized in Table 11. Implementation of the primary components of this plan to increase production of potable water is scheduled between 2008 and 2018. The projects will increase the combined maximum day capacity of all of the Lee County Utilities production facilities from 35.10 mgd to a combined capacity of 50.63. This combined capacity of 50.63 mgd is sufficient to meet the projected maximum daily demand of 38.40 mgd which is the projected demand based on the population projection performed by the Lee County Planning Department.

WATER SUPPLY FACILITIES WORK PLAN
LEE COUNTY UTILITIES
LEE COUNTY, FLORIDA

Section 5
ALTERNATIVE WATER RESOURCES

Use it Again, Florida!

5.1 Introduction

Lee County Utilities is proactively implementing, utilizing, and exploring alternative water resources. LCU's use of alternative sources is supported by the South Florida Water Management District's Lower West Coast Water Supply Plan. Several alternatives are incorporated in the current program or are proposed; they include:

- Aquifer Storage and Recovery
- Reclaimed Water Irrigation Systems
- Use of Floridan Aquifer
- Captured Storm water
- Desalination
- Water Conservation

Many benefits are obtained from Lee County's alternative water resource program; they include:

- Maintain sustainability of the shallow fresh water aquifers.
- Maintain a steady raw water supply for growth.
- Minimize stress on the wellfields.
- Provide landscape irrigation water supply during droughts.
- Minimize the amount of water withdrawn from the Surficial aquifer.
- Minimize withdrawal from a Minimum Flow and Level (MFL) water body during droughts.
- Recharging the Surficial Aquifer

Below is a summary of each component of the program.

5.2 Aquifer Storage and Recovery

In simple terms, Aquifer Storage and Recovery (ASR) is the storage of excess fresh water by injection into a confined aquifer for recovery during periods of high demand. Typically, treated fresh water is injected into an aquifer suitable for storage during the rainy season which in Southwest Florida coincides with the low demand period. As seasonal residents and tourists arrive, typically during the dry season, stored water is recovered from the ASR wells to meet the increase in demand. Utilization of ASR is an effective means to maintain a steady raw water supply and minimize stress on wellfields and surrounding wetlands by minimizing the amount of water withdrawn from the Surficial aquifer during the dry season. In the case of the Olga WTP ASR program, use of ASR will minimize the withdrawal of water during the dry season from a water body that has an established Minimum Flow and Level.

5.2.1 Potable Water ASR

Lee County Utilities has experienced a great deal of success with its ASR program. Currently, there are five ASR wells at the Corkscrew Water Treatment Plant (see Figure 14). These five wells have been in full operation for several years and a recovery rate of nearly 100% has been realized. LCU also has installed two ASR wells at the Olga Water Treatment Plant and one well at the North Reservoir site (see Figure 4 &13). Three additional ASR wells are planned for the Olga WTP. These wells will allow for additional injection of treated surface water from the Caloosahatchee River during the rainy season and recovery during the dry season. A description of the eight existing and three proposed ASR wells are shown in Table 10. It should be noted that the progress of LCU's Potable Water ASR program has been slowed due to a change in regulation regarding Arsenic. LCU is moving forward cautiously with this program as FDEP and EPA formulate a policy regarding Arsenic as it relates to potable water ASR wells.

5.2.2 Groundwater to Groundwater ASR

LCU has plans to develop a groundwater to groundwater ASR well system in the Green Meadows area. Groundwater from the Sandstone aquifer will be withdrawn during the rainy season and stored in ASR for recovery during the dry season.

5.2.3 Reclaimed Water ASR

LCU is examining the feasibility of utilizing ASR technology for the storage of reclaimed water. Seasonal Storage of reclaimed water will allow for better management of this resource, allowing for a higher percentage of utilization and possibly eliminate the need for disposal through a deep injection well or surface water discharge.

5.3 Reclaimed Water Systems

5.3.1 Introduction

Lee County Utilities owns and maintains several reclaimed water systems (see Figure 15). These systems provide many benefits. They reduce the amount of groundwater that is withdrawn in their respective service areas as well as recharge the local aquifers. Increasing the utilization of reclaimed water reduces the amount of water lost through surface water discharge or down a deep injection well. Lee County Utilities has taken and plans to take several steps to reduce these losses. LCU has installed interconnects between systems to enable systems with low demand to provide reclaimed water to systems with high demands. LCU has installed storage facilities to better manage reclaimed water and increase utilization. LCU has plans to enhance storage of reclaimed water. These plans include conventional above ground facilities for short-term storage and LCU is exploring the possibility of reclaimed water ASR for long-term seasonal storage. LCU was an active participant and contributed funds to the SFWMD's Regional Irrigation Distribution System Study. Below is a brief description of LCU's reclaimed water systems.

5.3.2 Fort Myers Beach WWTP

Lee County Utilities initiated its reclaimed water program in 1990 with the completion of the Fort Myers Beach WWTP Reuse System (see Figure 16). At that time the system consisted of 10 reuse sites, most of which were large users such as golf courses. Also included in the system is a set of 6 percolation ponds with a capacity of 60 million gallons. Since that time the system has grown and now consists of more than 25 reuse sites and the percolation ponds with a deep injection well for alternative disposal. The Fort Myers Beach WWTP has a permitted capacity of 6.0 million gallons per day (MGD). The plant currently produces approximately 3.8 mgd of reclaimed water. In 2007, an annual average of 3.81 MGD of the reclaimed water produced at the plant and 0.38 MGD was sent to the reuse service through an interconnect with LCU's Fiesta Village reuse system. Of the 4.19 MGD available for use 3.55 MGD was reused. Reclaimed water utilization in 2007 for this facility was 85%.

5.3.3 Fiesta Village WWTP

In 1999 Lee County Utilities purchased the Fiesta Village WWTP Reclaimed Water System from Florida Cities Water Company (see Figure 16). With two of the reuse sites being placed into service in the early 1970's, this reclaimed water system is one of the oldest public access reclaimed water system in Florida. The system currently consists of more than 10 reuse sites consisting of golf courses, parks, roadway medians and common areas. For alternative disposal the system has a permit to discharge into the Caloosahatchee River. The permitted capacity of the plant is 5.0 MGD. The plant currently produces approximately 2.5 mgd of reclaimed water. In 2007 the plant produced 2.95 mgd on annual average. Of this 2.95 mgd, 1.93 mgd was reused. Reclaimed water utilization in 2007 for this facility was 65%.

In an effort to increase the reclaimed water utilization for this facility and reduce the amount reclaimed water discharged to the Caloosahatchee River an interconnect between the Fiesta Village reuse system and the Fort Myers Beach reuse system was installed in 2002. This interconnect allows for a transfer of reclaimed water from the Fiesta Village system, which has a low demand to the Fort Myers Beach system which has a high demand.

5.3.4 Waterway Estates WWTP

In 1999 Lee County Utilities purchased the Waterway Estates WWTP Reclaimed Water System from Florida Cities Water Company (see Figure 17). The system currently consists of 2 reuse site, a proposed golf course, and the City of Cape Coral. LCU also has a permit to discharge into the Caloosahatchee River for alternative disposal. The permitted capacity of this facility is 1.3 mgd. The plant currently produces approximately 1.0 mgd of reclaimed water, on annual average. In 2007 the plant produced 0.983mgd of reclaimed water on annual average. Of this 0.983 mgd, only 0.325 mgd was reused. Reclaimed water utilization in FY 2007 for this facility was 33% and 50% for calendar year 2007.

In the past, issues related to storage in this reclaimed water system have resulted in low reclaimed water utilization. In an effort to increase the reclaimed water utilization for this facility, and reduce the amount reclaimed water discharged to the Caloosahatchee River, LCU has taken the following steps. A reclaimed water interconnect between the Waterway Estates system and the City of Cape Coral's reclaimed water system has been installed. A reuse agreement between Lee County Utilities and The City of Cape Coral has been executed. A 0.75 million-gallon storage tank and pumping facility was constructed and placed into service in mid 2007. Completion of this infrastructure has enhanced delivery of reclaimed water to the City of Cape Coral and will enhance delivery to the proposed golf course. Having this storage tank in the system for half of FY 2007 has increased the annual average utilization from 0% to 33% and to 50% in calendar year 2007. LCU will continue to enhance the reclaimed water system in the service area with a goal of achieving as close as 100% reclaimed water utilization as possible.

5.3.5 Three Oaks WWTP

In 2003 Lee County Utilities purchased the Three Oaks WWTP Reclaimed Water System from Gulf Environmental Services Inc (see Figure 18). The system currently consists of 6 active reuse sites all are golf course communities. The plant currently has a permitted capacity of 3.0 mgd. A plant expansion to bring this facility to 6.0 mgd is currently underway and the expansion should be completed by the end of 2008. Included in the expansion project is a deep injection well which will be utilized for wet weather disposal. The plant currently produces approximately 1.84 mgd of reclaimed water on an annual average. 100% or the reclaimed water that is currently produced at this facility is reclaimed for irrigation.

5.3.6 San Carlos WWTP

In 2003 Lee County Utilities purchased the San Carlos WWTP Reclaimed Water System from Gulf Environmental Services Inc (see Figure 18). The system currently consists of 1 reuse site, a golf course. Like the Fiesta Village system, the San Carlos WWTP Reclaimed Water System enjoys the distinction of being one of the oldest public access reclaimed water systems. The plant has been serving its one customer since the early 1970's. The plant has a permitted capacity of 0.30 mgd. The plant currently produces approximately 0.218 mgd of reclaimed water on an annual average. Having no alternative disposal method, this system's reclaimed water utilization is 100%.

5.3.7 Pine Island WWTP

In 1999 Lee County Utilities constructed the Pine Island WWTP. The plant has a treatment capacity of 0.50 mgd and a permitted capacity of 0.474 mgd. It is currently producing approximately 0.117 mgd of reclaimed water. The reclaimed water produced at this plant recharges the local shallow aquifer through two spray irrigation fields. The plant also has wet weather disposal capability through a deep injection well shared with the Greater Pine Island Water Association. LCU has recently executed agreements for delivery of reclaimed water for irrigation of common areas and agricultural operations in the regional reuse service area permitted through FDEP. Currently this systems reclaimed water utilization is 100%.

5.3.8 High Point WWTP
The High Point plant is a small package plant in North Fort Myers that produces approximately 0.012mgd of reclaimed water. The plant has a permitted capacity of 0.024 mgd. The reclaimed water from this plant is sent to percolation ponds were it recharges the local shallow aquifer.

5.3.9 Gateway WWTP
In 2003 Lee County Utilities purchased the Gateway WWTP Reclaimed Water System from Gateway Services District. The system currently consists of 1 reuse site, the Gateway community and golf course. The plant has a permitted capacity of 1.0 mgd. The plant currently produces approximately 0.601 mgd of reclaimed water on an annual average. The Gateway Community's irrigation demand is far greater than the reclaimed water produced by this facility, therefore, this system's reclaimed water utilization in 100%. A design to expand this facility to 3.0 mgd has been completed and construction of this expansion is in progress with completion expected in early to mid 2010.

The table below provides a summary of LCU's reclaimed water system.

LEE COUNTY UTILITIES
RECLAIMED WATER SYSTEMS
DETAILS

Facility	Reuse Type (golf course, residential, etc.)	Alternative Disposal	FY 2006-2007 % Reclaimed Utilization
Fort Myers Beach WWTP	golf course, residential, parks, percolation ponds, road median,	Deep Injection Well	93%
Fiesta Village WWTP	golf course, sports field, residential, road median	Surface Water Discharge	65%
Three Oaks WWTP	golf course	Deep Injection Well	100%
San Carlos WWTP	golf course	None	100%
Pine Island WWTP	spray fields	None	100%
Waterway Estates WWTP	golf course, bulk service to another reclaimed water system	Surface Water Discharge	33% *
High Point WWTP	perc ponds	None	100%
Gateway WWTP	golf course, residential common areas	None	100%

* increased to 50% in calendar year 2007

5.4 Use of the Floridan Aquifer

Lee County Utilities has recently initiated and plans to continue use of this alternative source for drinking water. By utilizing this deep saline aquifer LCU will reduce its dependency on conventional sources such as shallow aquifers and surface water.

5.4.1 North Lee County Water Treatment Plant

Placed on-line in August 2006 the North Lee County Water Treatment Plant and wellfield initially produced 5.0 mgd of water from the Floridan aquifer. Due to lost production the facility is currently yielding 3.5 mgd. Phase I of the wellfield expansion project will regain the loss in production back to 5.0 mgd. Phase II will involve expanding the treatment plant and the wellfield to a capacity of 10.0 mgd.

5.4.2 Corkscrew Water Treatment Plant

Currently under construction is an expansion to the Corkscrew Wellfield. Expansion of the wellfield includes the installation of 3 Lower Hawthorn aquifer wells. Raw water from these 3 wells will be blended with water from conventional sources to provide additional capacity to the facility (see Proposed Wells LH1-LH3, Figure 5).

5.4.3 Pinewoods Water Treatment Plant

An expansion of the Pinewoods wellfield was completed in 2007. The expansion included the addition of 5 Lower Hawthorn aquifer wells (see Figure 7). Raw water from these 5 wells is treated in a new reverse osmosis plant also completed in 2007. The finish water from the RO facility is blended with water from conventional sources to provide additional capacity to the facility.

5.4.4 Green Meadows Water Treatment Plant

LCU proposes to construct a new 16.0 mgd reverse osmosis (RO) water treatment plant to replace the aging existing lime softening treatment system currently permitted for 9.0 mgd at this site. Additional withdrawals of brackish water from the Lower Hawthorn aquifer along with current withdrawals from Surficial and Sandstone aquifers will be blended and treated in the new facility. An increase in allocation from traditional fresh water sources currently permitted is not proposed. Fourteen new Lower Hawthorn wells located in LCU's existing easement are proposed to increase the capacity of the wellfield (see Figure 6). The proposed capacity increase of 7.0 mgd will be supplied by raw water from the Lower Hawthorn aquifer, an alternative source. The project is currently under preliminary design and an application for modification to the consumptive use permit has been submitted to the SFWMD. Once the water use permit associated with this project is obtained, the project will be programmed into the CIP.

5.4.5 Olga Water Treatment Plant

LCU is currently performing a study on alternative water supplies for the Olga facility. One of the options being considered is use of the Floridan aquifer for a source of supply for this facility.

5.5 Captured Storm Water

LCU is currently exploring opportunities for capturing storm water for potable water supply. Multiple benefits can be realized from developing storm water storage. Along with the possibility of providing raw water for meeting potable water demands there is a potential for providing flood protection, improvement in water quality, and restoration of base flows to in natural systems.

5.6 Desalination

LCU has cooperated with, provided information for, and remained engaged with previously completed feasibility studies regarding desalination facilities. In June 2002 one such feasibility study was completed. The study was commissioned by the SFWMD and Florida Power and Light (FP&L) and completed by Water Resource Associates, Inc. and URS. This study was titled, "Feasibility Study for Co-Locating Reverse Osmosis Treatment Facilities with Electric Power Plants". The study evaluated 23 potential sites for co-locating a desalination facility with a power plant. Of the 23 sites evaluated two sites were deemed "highly desirable" and recommended for further evaluation. One of those sites was the Florida Power and Light site on S.R. 80, within LCU's service area and in close proximity to one of LCU's main water transmission lines. The conclusion of this study prompted LCU to give serious consideration to the option of desalination. Since this study was released, LCU representatives have participated in several meetings with FP&L and the SFWMD to discuss the potential for co-location a desalination facility at the location referenced above. Another feasibility study titled "Technical & Economic Feasibility of Co-Locating Desalination Facilities" was completed by Metcalf and Eddy in December of 2006. This study further refined technical, economic and regulatory feasibility of the desalination option. As in the first study the FP&L site in LCU's service area emerged as a top ranking potential site. LCU continues to give serious consideration to the desalination option. LCU is also considering a pilot study to further evaluate the feasibility of this option. A Feasibility Analysis/Design of a desalination facility along with related transmission mains are programmed in the CIP in years 6-10.

5.7 Water Conservation Plan

1) Permanent Irrigation Ordinance – Patterned after the SFWMD rule FAC 40E-24 "Mandatory Year-Round Landscape Irrigation Measures for Lee, Collier & Charlotte Counties", an ordinance, which restricts landscape irrigation to the hours of 5:00 p.m. to 9:00 a.m. two days per week, is in effect for Le County Utilities' service area (Lee County Ordinance 05-10). This ordinance is more restrictive than the SFWMD rule referenced above. The ordinance also incorporates the SFWMD water shortage rules by reference.

2) Xeriscape Ordinance –An ordinance that requires the use of xeriscape landscape principles has not been adopted, however, Lee County Land Development Code does require Xeriscaping. Chapter 10, Article III, Division 6 (Open Space, Buffering, and Landscaping), Section 10-412 (Purpose and Intent) states: "Promote water conservation and xeriscape principles by requiring the use of native plants, organic mulch, reduction of turf grass, and appropriate irrigation." Also Section 10-421 (Plant Installation and Maintenance Standards) states: "All required plants used in buffers and landscaping must be installed using xeriscape principles. Xeriscape principles include water conservation through drought-tolerant landscaping, the use of appropriate plant material, mulching and reduction of turf areas."

3) Ultra-low Volume Plumbing Fixture Ordinance – An ordinance that requires ultra-low volume plumbing fixtures on all new construction is in effect for the service area (Lee County Ordinance 92-36.)

4) Water Conservation Rate Structure – Lee County Resolution No. 07-08-70, adopted August 14, 2007, provides for an increasing block rate structure. The resolution also provides for an 18% surcharge to the rates in the event of a District declared reduction in water use of 15% or greater due to a declared water shortage.

5) Leak Detection Program – Lee County has an unaccounted-for water and leak detection program. The latest available data indicate that "unaccounted for" water losses are only 6.22% (calendar year 2006).

6) Rain Sensor Device Ordinance – In January 1999 the Lee County Land Development Code was revised to include a requirement for rain sensors on irrigation systems. Chapter 10, Article III, Division 6, Section 10-414(b)(3) states: "A moisture (rain) sensor will be included in the irrigation system and located on the site so that it will receive direct rainfall, not impeded by other objects."

7) Water Conservation Education Program – In the summer of 2000 Lee County Utilities developed a web site that is updated regularly. This web site contains several pages devoted to water conservation and water restrictions. The address for this site is http://www,lee-county.com/utilities/. In addition, Lee County Utilities periodically prints water conservation tips on the water bills. These messages direct the customer to the web site for additional information. The annual Consumer Confidence Report is also used to direct customers to the web

site for additional information. Water Conservation posters and pamphlets are placed in schools, libraries, and other county offices. During times of water restrictions Lee County Utilities has run public service announcements in cooperation with the District. LCU has an active program that provides water conservation presentations to third grade students in several schools throughout Lee County. Approximately 20 presentations are given to third graders every year. LCU also participates in the Lee County Speakers Bureau program resulting in 4-5 water conservation presentations being provided to civic organization throughout Lee County.

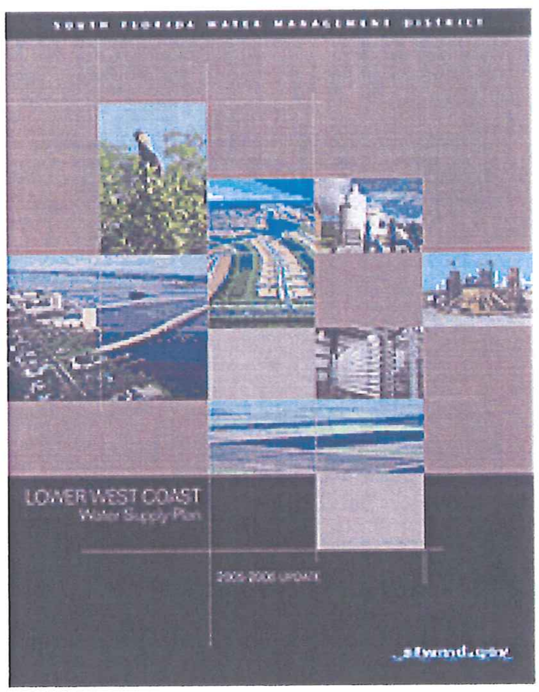
8) Reclaimed Water – Reuse (Reclaimed) water is a very important part of Lee County Utilities' water conservation strategy. Currently, seven wastewater treatment plants that serve the LCU service area produce reuse water under permit from FDEP. They are Fort Myers Beach WWTP, Fiesta Village WWTP, Waterway Estates WWTP, Pine Island WWTP, Three Oaks WWTP, San Carlos WWTP and Gateway WWTP. The percentage of reclaimed water utilization by LCU has increased steadily throughout the years as the use of reclaimed water has expanded. In fiscal year 2006/2007, approximately 79.3% of the wastewater treated by LCU was beneficially used for irrigation.

9) Conservation Plan Updating – Lee County staff recognizes the importance of regularly evaluating its conservation plan. Assessment of future demands leads to discussion and research into possibilities for the reduction of water demand. Continuing education of customers and cooperation with various agencies' programs of water reduction and re-use reduce the need for increased treatment capacity. As more advanced leak detection and accounting methods become available, it is the best interest of Lee County to utilize these tools.

10) Television Ads on Water Conservation – Lee County T.V. air daily information on water conservation. We keep these ads up to date. The ads address many ways with which our customers can save this precious resource.

WATER SUPPLY FACILITIES WORK PLAN
LEE COUNTY UTILITIES
LEE COUNTY, FLORIDA

Section 6
CONSISTENCY WITH REGIONAL PLAN



6.1 CONSISTENCY WITH REGIONAL PLAN

Based on recommendations from previous Lower West Coast Water Supply Plans, LCU has followed a strategy of diversifying water supply options and developing alternative sources and storage options. LCU currently utilizes the following sources of raw water; Water Table, Surficial, Sandstone, Mid-Hawthorn and Lower Hawthorn aquifers as well as surface water. In addition LCU continues to increase its use of reclaimed water, increasing the percentage of utilization of this resource every year. LCU has developed interconnects between reclaimed water systems in an effort to maximize its use of this resource. LCU has also developed several successful potable water ASR systems and plans to develop reclaimed ASR systems in the future.

In July of 2006 the SFWMD adopted the updated Lower West Coast Water Supply Plan 2005-2006 (LWCWSP). Lee County Utilities participated in the regional planning conducted during preparation of the Plan and has made every effort to ensure that LCU's water supply planning is consistent with the regional plan. The focus of the 2005-2006 LWCWSP is the development of alternative water sources. LCU has followed the recommendations of the plan and has developed alternative water supplies. LCU has developed supplies from the Lower Hawthorn aquifer at the North Lee County WTP, Pinewoods WTP and Corkscrew WTP. LCU plans to utilize the Lower Hawthorn aquifer at the Green Meadows WTP. LCU has developed potable water ASR facilities at the Corkscrew WTP and the Olga WTP and plans to expand the use of potable water ASR at the Olga facility as well as in the Green Meadows/Corkscrew area. LCU is also planning to utilize ASR for the storage of reclaimed water in the future. As demonstrated in the proceeding information presented in this plan, all of LCU's future water supply development is planned to be from alternative water supply sources. Presented below is a table showing the Lee County Utilities' alternative water supply projects listed in the 2005-2006 LWCWSP.

LEE COUNTY UTILITIES
ALTERNATIVE WATER SUPPLY PROJECTS LISTED IN THE 2005-2006 LOWER WEST COAST WATER SUPPLY PLAN

Project	Water Source	Project Capacity (MGD)	Year Water is First Produced	Total Esimated Capital Cost ($M)	Annual O&M Costs ($M)
Corkscrew Lower Hawthorne Wells Phase II	Brackish	0.75	2007	$0.35	$0.01
Green Meadows Lower Hawthorne Wells	Brackish	2.00	2007	$0.80	$0.01
North Lee County Lower Hawthorne Wellfield & Plant Expansion	Brackish	5.00	2008	$20.00	$0.07
Pinewoods WTP Expansion Phase II	Brackish	3.00	2007	$6.67	$1.65
Green Meadows ASR	Capture ASR	0.37	2008	$7.00	$0.09
Three Oaks Parkway Reclaimed Water Transission System	Reclaimed	1.00	2007	$1.22	$0.00
Fort Myers Beach WWTP Reclaimed Water Elevated Storage Tank	Reclaimed	1.20	2007	$1.50	$0.01
Health Park Reclaimed Water ASR Phase I	Reclaimed	1.00	2008	$1.20	$0.01
Health Park Reclaimed Water ASR Phase II	Reclaimed	1.00	2010	$0.80	$0.01
FGCU / Mirror Lakes Reclaimed Water Main	Reclaimed	1.00	2007	$0.30	$0.00
RCS Reclaimed Water Interconnect	Reclaimed	1.00	2007	$0.55	$0.00

Several of the projects listed above have been completed and some others have had a change in scope since being published in the 2005-2006 LWCWSP. As required, LCU submitted an updated list and status report for alternative water supply projects listed in the LWCWSP to the SFWMD in October of 2007. Below is a summary of the update that was provided. Since submission of this list in January 2008, some project schedules have been revised and some projects have been added.

LEE COUNTY UTILITIES
ALTERNATIVE WATER SUPPLY PROJECTS LISTED IN THE
2005-2006 LOWER WEST COAST WATER SUPPLY PLAN
PROJECT UPDATE JANUARY 2008

Project	Water Source	Project Capacity (MGD)	Year Water is First Produced	Scope Change	Status
Corkscrew Lower Hawthorne Wells Phase II	Brackish	2.00	2008	Original Scope changed from 1 well producing 0.75mgd to 2 wells producing a total of 2.0 mgd	Project underway, scheduled for completion by August 08
Green Meadows Lower Hawthorne Wells	Brackish	7.00	2011	Original Scope changed from 2 wells producing 2.0 mgd to 14 Lower Hawthorne wells to produce 7.0mgd finished water	Phase I, Pilot /Production well under construction
North Lee County Lower Hawthorne Wellfield & Plant Expansion	Brackish	5.00	2010	No change in scope	Water Use Permit application for modification submitted, planning underway
Pinewoods WTP Expansion Phase II	Brackish	3.00	2007	No change in scope	Project Complete
Green Meadows ASR	Capture ASR	3.35	2010	Original scope was to procuce 0.37 mgd. Feasibility Study has indicated 3.35 mgd	Planning
Three Oaks Parkway Reclaimed Water Transission System	Reclaimed	3.00	2007	Originally anticipated to increase capacity of reclaimed system by 1.0, however enhancement will add an ultimate capacity of 3.0mgd	Completed
Fort Myers Beach WWTP Reclaimed Water Elevated Storage Tank	Reclaimed	1.20	2010	No change in scope	A low cost interim alternative has eliminated the emmediate need for this project, rescheduled to 2010
Health Park Reclaimed Water ASR Phase I	Reclaimed	1.00	2011	No change in scope	Issues related to Arsenic have delayed the project, now scheduled for 2011
Health Park Reclaimed Water ASR Phase II	Reclaimed	1.00	2012	No change in scope	Issues related to Arsenic have delayed the project, now scheduled for 2012
FGCU / Mirror Lakes Reclaimed Water Main	Reclaimed	1.00	2008	No change in scope	Lack of immediate need by developer has delayed the project one year
RCS Reclaimed Water Interconnect	Reclaimed	0.00	N/A	No change in scope	Lack of reclaimed water supply and finacial feasibility has reulted in postponing this project to a later date. The project is on hold.

6.2 COMPREHENSIVE LONG TERM WATER SUPPLY PLANNING

LCU is currently negotiating a contract with a consultant to develop an "Integrated Water Resources Master Plan" for Lee County Utilities. The Plan will integrate water supply, water treatment, wastewater collection, wastewater treatment, and the use of reclaimed water. This study will explore further use of alternative water sources such as brackish groundwater and surface water, expanded use of reclaimed water, the potential for utilizing storm water for supply, improved storage opportunities such as ASR and above ground storage, as well as the potential for seawater desalination. LCU expects to have the contract for this planning effort executed by June 2008 and a completed plan by early 2010.

6.3 IRRIGATION WATER DEMANDS

Irrigation includes two main components, agricultural irrigation and urban irrigation. The most current agricultural irrigation permit information is available through the South Florida Water Management District's office. Residential permit information is available through the Lee County Health Department, a state agency.

A comprehensive analysis of the demand for irrigation water in LCU's service area along with strategies for meeting these demands will be completed as part of the "Integrated Water Resource Master Plan" referenced above.

WATER SUPPLY FACILITIES WORK PLAN
LEE COUNTY, FLORIDA

SECTION 7
OTHER UTILITIES IN UN-INCORPORATED LEE COUNTY

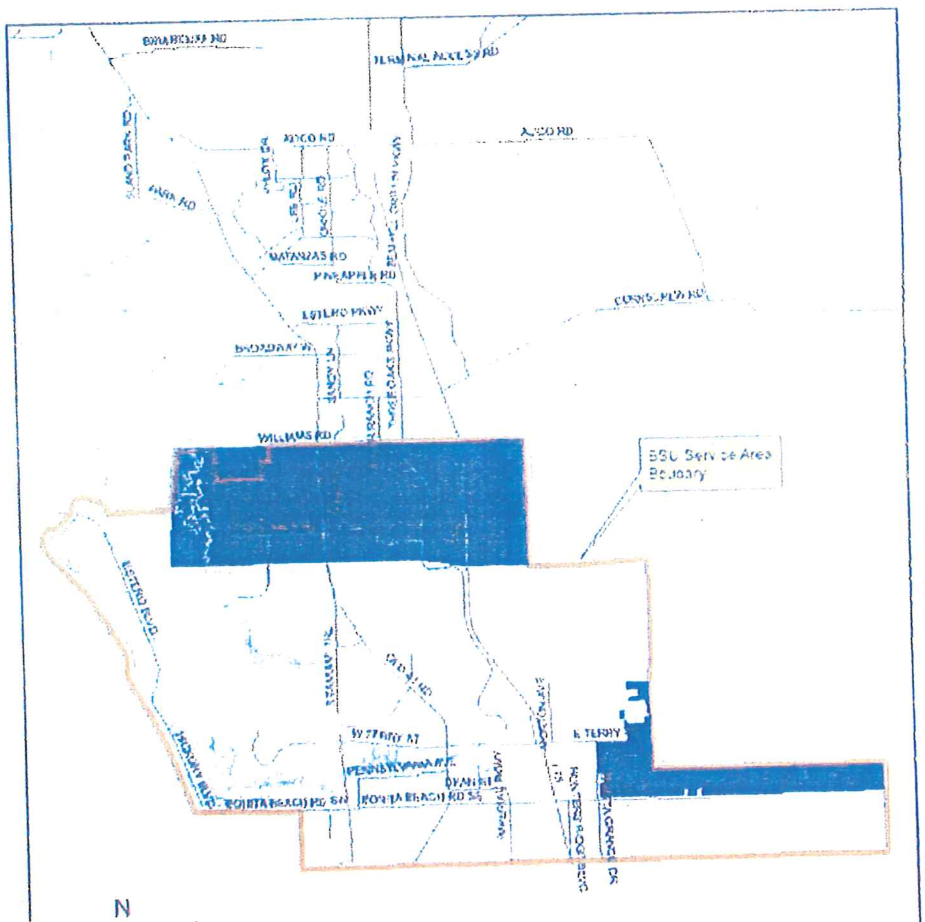
SECTION 7.1
BONITA SPRINGS UTILITIES

BONITA SPRINGS UTILITIES

Service Area

Bonita Springs Utilities (BSU) provides potable water service within the City of Bonita Springs as well as areas within Un-Incorporated Lee County. The BSU service area within Un-Incorporated Lee County is shown on the figure below. Approximately 25% of the BSU service area is within Un-Incorporated Lee County.

Bonita Springs Utilities
Water Service Area in Un-Incorporated Lee County



Consumptive Use Permits

BSU has two Consumptive Use Permits issued by the SFWMD. A summary of the general permit information is presented below.

Permit Number: 36-00008-W
Issued: August 9, 2007
Expires: August 9, 2027
Annual Allocation: 2,094 million gallons (2,094/365=5.74 mgd)
Maximum Month Allocation: 222.3 million gallons (222.3/30=7.41 mgd)
Source Limitation Annual: 985.5 mg (Lower Tamiami-West Wellfield)
Source Limitation Daily: 3.18 mg (Lower Tamiami-West Wellfield)

Permit Number: 36-04062-W
Issued: January 21, 2005
Expires: January 21, 2025
Annual Allocation: 4,769 million gallons (4,769/365=13.06 mgd)
Maximum Daily Allocation: 16.0 mgd

Existing Water Supply

BSU has three wellfields, the East Wellfield, West Wellfield, and the R.O. Wellfield.

East and West Wellfields – Lower Tamiami
The East and West Wellfields withdrawal water from the Lower Tamiami Aquifer. The location of these two wellfields is shown on the attached map labeled Exhibit 3 from the consumptive use permit staff report of permit number 36-00008-W referenced above. There are a total of 22 Lower Tamiami wells in these two wellfields. The diameter of these wells range from 8" to 12" and they range in depth from 80 feet to 115 feet. The capacity of each well range from 125 gpm to 1,000 gpm. The combined total capacity of all the wells is 11,550 gpm.

R.O. Wellfield
The R.O. wellfield withdrawals water from the Floridan Aquifer. The location of this wellfield is shown on the attached map labeled Exhibit 3 from the consumptive use permit staff report of permit number 36-04062-W referenced above. The wellfield consists of 8 existing wells. The diameter of these wells range from 12" to 16" and the total depths range from 701 feet to 1,080 feet. The capacities of the wells range from 1,000 gpm to 2,000 gpm. The combined total capacity of all the wells is 9,000 gpm.

Treatment Facilities

Raw water from the East and West wellfields is treated in a conventional lime softening water treatment plant with a permitted capacity of 9.0 mgd. Water from the R.O. wellfield is treated in a Reverse Osmosis treatment Plant with a permitted capacity of 6.54 mgd. The plant is expandable to 12 mgd. Both facilities are located on East Terry Street on the west side of I-75, in Bonita Springs.

Storage Facilities

BSU has above ground storage tanks with a combine total of 7.75 million gallons of capacity to meet peak hour demands in the system.

Demand Projections

Water demand projections are presented in the table below. This demand projection was supplied to Lee County by Bonita Springs Utilities.

BONITA SPRINGS UTILITIES
WATER DEMAND PROJECTIONS

Year	Projected Population	Number of Units (ERC's)	Average Daily Demand (MGD)	Maximum Day Demand (MGD)
2005	65,300	43,100	9.3	12.9
2010	71,700	48,700	10.5	14.6
2015	73,650	49,600	10.7	14.8
2020	74,500	50,200	10.8	15.0

Proposed Water Supply Sources

BSU plans to install seven additional Floridan wells in its R.O. wellfield. The wells are proposed to be 16" in diameter, 900 feet deep and each with a capacity of 1,400 gpm. The wells are currently included in permit number 36-04062-W. As mentioned above the existing R.O. plant is expandable to 12 mgd.

Note

It should be noted that the information provided above includes the entire service area for BSU. The unincorporated portion of this service area only represents approximately 25% of the total.

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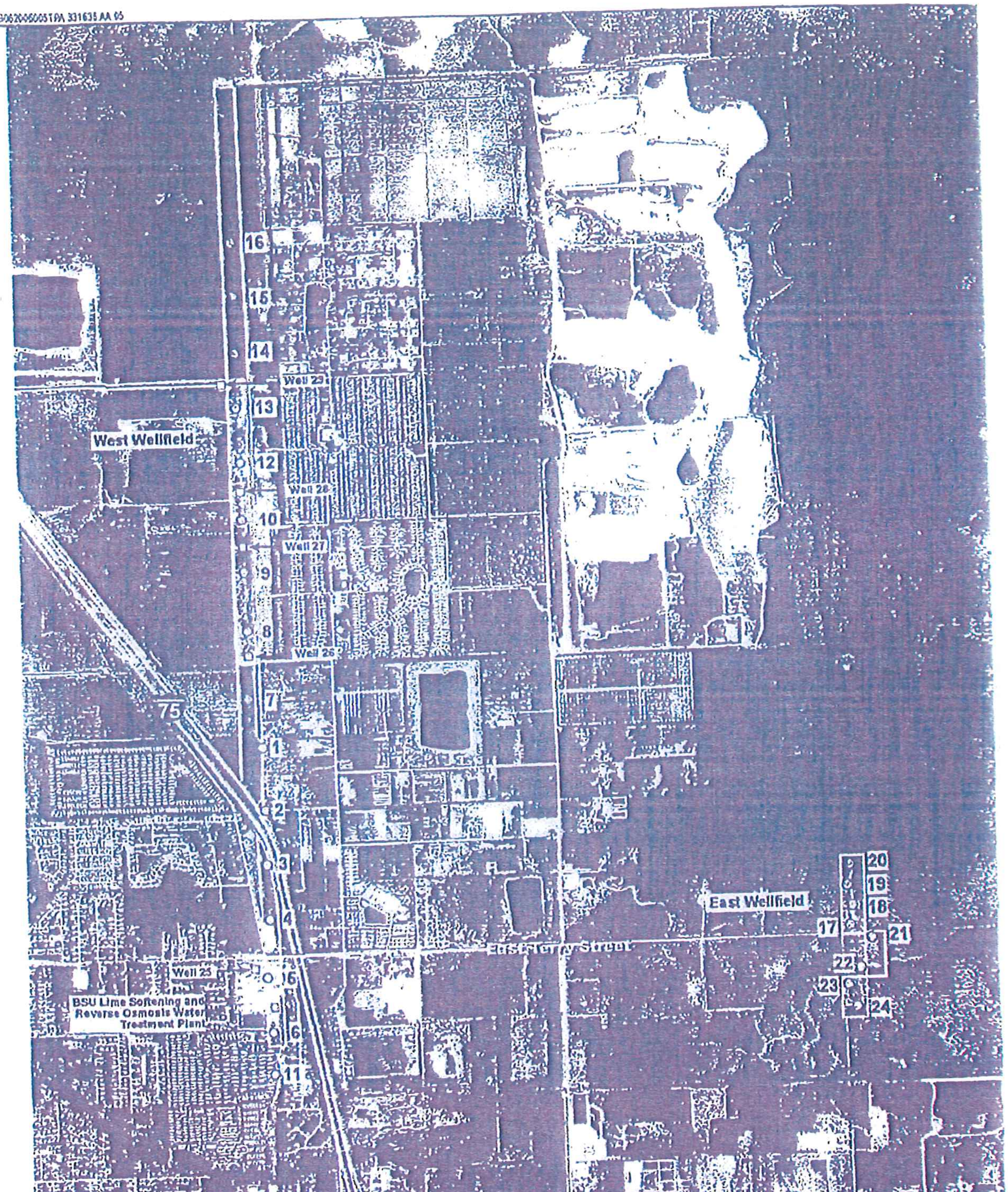


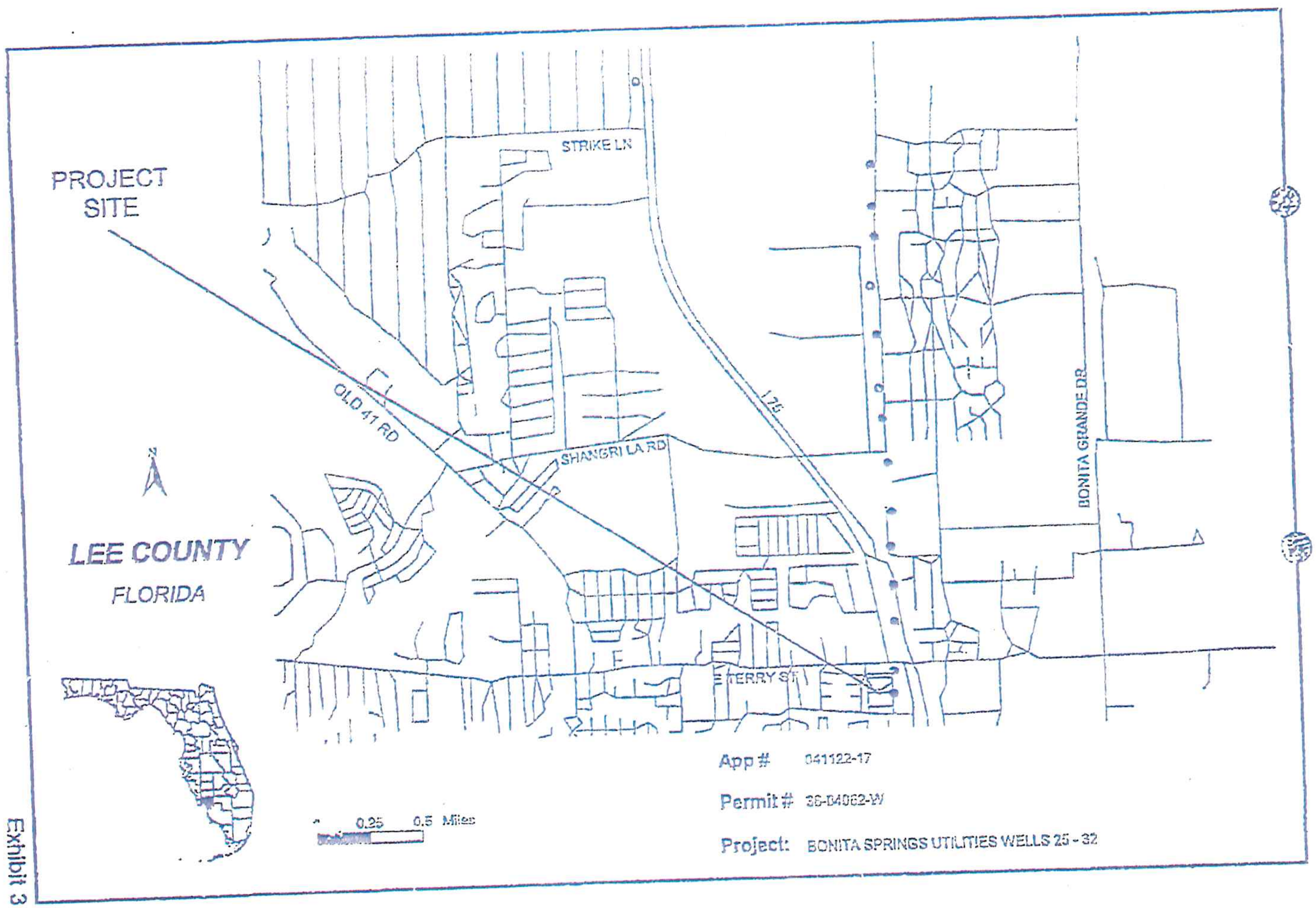
Scale in Feet
0 1000 2000
0 1/4 1/2
Scale in Miles

LEGEND
BSU Franchise Area Boundary
○ Lower Tamiami Wells 36-0008-W
□ RO WTP Injection Well
□ Upper Floridan Wells 36-04062-W

EXHIBIT B-2b
Tamiami Wellfield Site Map
Application for Water Use Permit Renewal
Bonita Springs Utilities, Inc.

CH2MHILL

EXHIBIT 3



PROJECT SITE
STRIKE LN
OLD 41 RD
75
SHANGRI LA RD
BONITA GRANDE DR
E TERRY ST
LEE COUNTY
FLORIDA
0.25 0.5 Miles
App # 041122-17
Permit # 36-04062-W
Project: BONITA SPRINGS UTILITIES WELLS 25 - 32
Exhibit 3

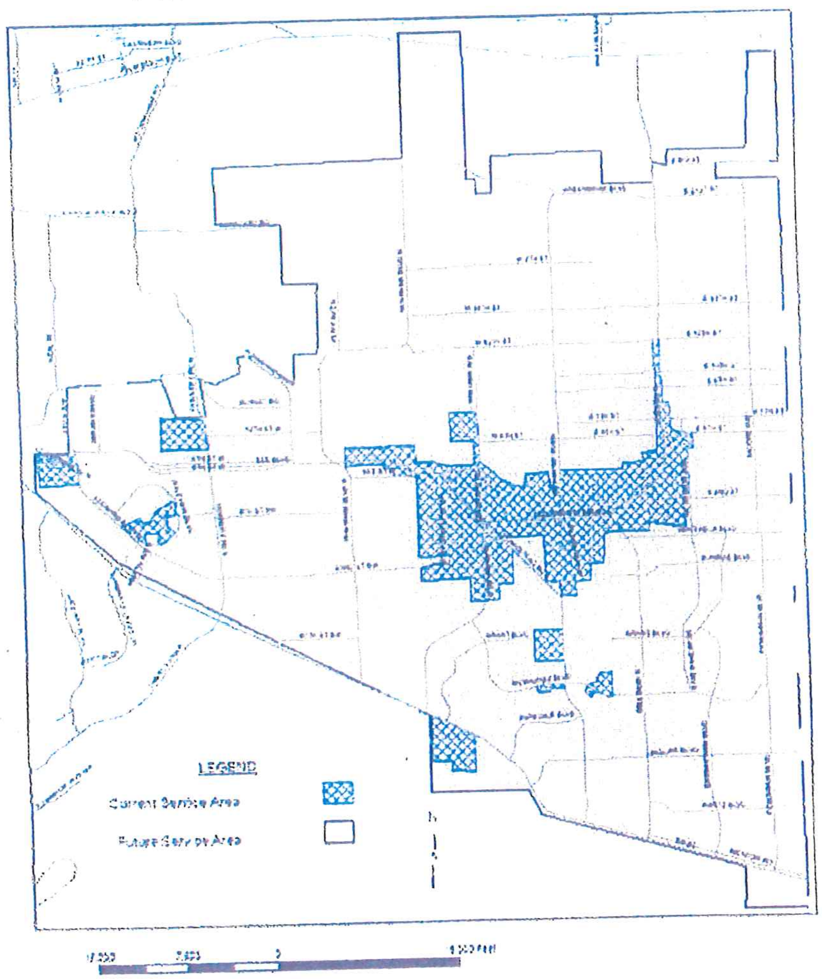
SECTION 7.2
FLORIDA GOVERNMENTAL UTILITY AUTHORITY

FLORIDA GOVERNMENTAL UTILITY AUTHORITY

Service Area

The Florida Governmental Utility Authority (FGUA) has a franchise area that generally encompasses the area of un-incorporated Lee County known as the community of Lehigh Acres. The area currently served with water is shown in blue cross hatch. The area shown in pink is FGUA's entire service area and the proposed area to be served in the future.

FLORIDA GOVERNMENTAL UTILITY AUTHORITY
Future Service Area, Current Service Area



Existing Consumptive Use Permit

FGUA has a Consumptive Use Permit issued by the SFWMD. A summary of the general permit information is presented below.

Permit Number: 36-00166-W
Issued: March 11, 2004
Expired: December 11, 2006
Annual Allocation: 1,206 Million Gallons (1206/365= 3.304 MGD AADF)
Maximum Monthly Allocation: 112.499 Million Gallons (112.499/30 = 3.75 MGD)
Note: a timely application for renewal / modification was submitted on 12/8/06, (see discussion below)

Existing Water Supply

The existing FGUA wellfield in the center of Lehigh Acres 13 existing Sandstone aquifer wells that vary in diameter from 6" to 12" in diameter. There is one existing Sandstone well at the new wellfield location near the corner of Bell Blvd. and Milwaukee Ave (see attached figure Exhibit 3A from FGUA's CUP) The wells are rated at capacities between 150 gallons per minute (gpm) and 500 gpm. The wells have a total capacity of 3,050 gpm. The existing permit includes 3 proposed Sandstone aquifer wells with a total capacity of 1,500 gpm. The location of the existing and proposed wells is shown on the attached figures titled Exhibit 3A, 3B, and 3C. These exhibits are copies of exhibits from FGUA's existing consumptive use permit staff report. A description of these wells is shown on the attached copy of Table A, labeled Exhibit No: 8 from FGUA's existing consumptive use permit staff report.

Existing Treatment Facilities

FGUA's Treatment Plant #1 is rated at 3.11 MGD and treats raw water from the 13 Sanstone aquifer wells referenced above. FGUA's recently completed Treatment Plant #2 has a capacity of 1.10 MDG. Treatment Plant #2 will initially treat raw water from the 3 of the four permitted sandstone aquifer wells at the plant site.

Existing Storage Facilities

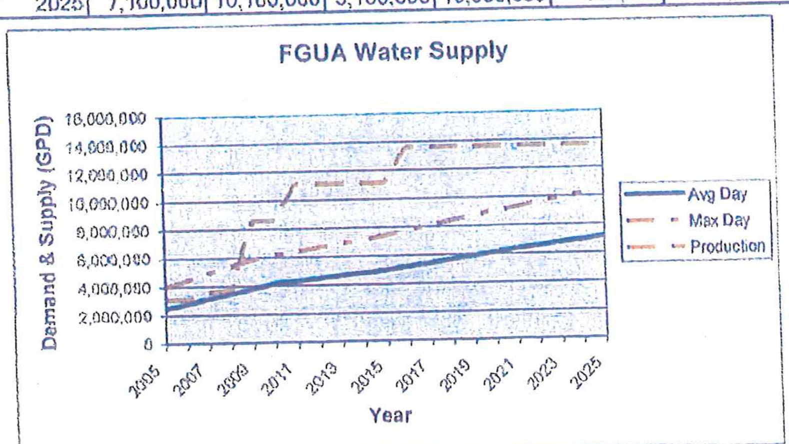
FGUA currently has two storage facilities. One elevated storage tank at he corner of Homestead Road and Arthur Ave with a storage capacity of 0.25 MG and a ground storage tank on Lee Blvd. and Abrams Blvd with a capacity of 0.5 MG.

Demand Projections

Finished water demand projections are presented in the table below. This demand projection was obtained from FGUA's recent consumptive use permit application. This projection is based on the median values of a projection performed by Lee County Planning Department and a linear projection based on past growth. The table also shows the proposed production from the various existing and proposed water treatment plants (WTP) and related wellfields.

FLORIDA GOVERNMENT UTILITY AUTHORITY, LEHIGH ACRES WATER PROJECTED DEMAND AND PROPOSED PRODUCTION

YEAR	DEMAND AVG DAY (GPD)	DEMAND MAX DAY (GPD)	OUTPUT WTP #1 (GPD)	OUTPUT WTP #2 (GPD)	FT MYERS INTER-CONNECT (GPD)	TOTAL PRODUCTION
2005	2,471,810	3,213,355	3,100,000	0	0	3,100,000
2006	2,800,000	4,010,000	3,100,000	0	0	3,100,000
2007	3,130,000	4,480,000	3,100,000	0	500,000	3,600,000
2008	3,460,000	4,950,000	2,200,000	1,100,000	500,000	3,800,000
2009	3,800,000	5,430,000	3,100,000	5,000,000	500,000	8,600,000
2010	4,130,000	5,900,000	3,100,000	5,000,000	500,000	8,600,000
2011	4,300,000	6,140,000	3,100,000	7,500,000	500,000	11,100,000
2012	4,470,000	6,390,000	3,100,000	7,500,000	500,000	11,100,000
2013	4,640,000	6,630,000	3,100,000	7,500,000	500,000	11,100,000
2014	4,810,000	6,880,000	3,100,000	7,500,000	500,000	11,100,000
2015	4,980,000	7,120,000	3,100,000	7,500,000	500,000	11,100,000
2016	5,200,000	7,440,000	3,100,000	10,000,000	500,000	13,600,000
2017	5,430,000	7,760,000	3,100,000	10,000,000	500,000	13,600,000
2018	5,660,000	8,090,000	3,100,000	10,000,000	500,000	13,600,000
2019	5,880,000	8,410,000	3,100,000	10,000,000	500,000	13,600,000
2020	6,110,000	8,730,000	3,100,000	10,000,000	500,000	13,600,000
2021	6,310,000	9,020,000	3,100,000	10,000,000	500,000	13,600,000
2022	6,510,000	9,300,000	3,100,000	10,000,000	500,000	13,600,000
2023	6,710,000	9,590,000	3,100,000	10,000,000	500,000	13,600,000
2024	6,900,000	9,870,000	3,100,000	10,000,000	500,000	13,600,000
2025	7,100,000	10,160,000	3,100,000	10,000,000	500,000	13,600,000



Source:Data obtained from FGUA's Consumptive Use Permit application

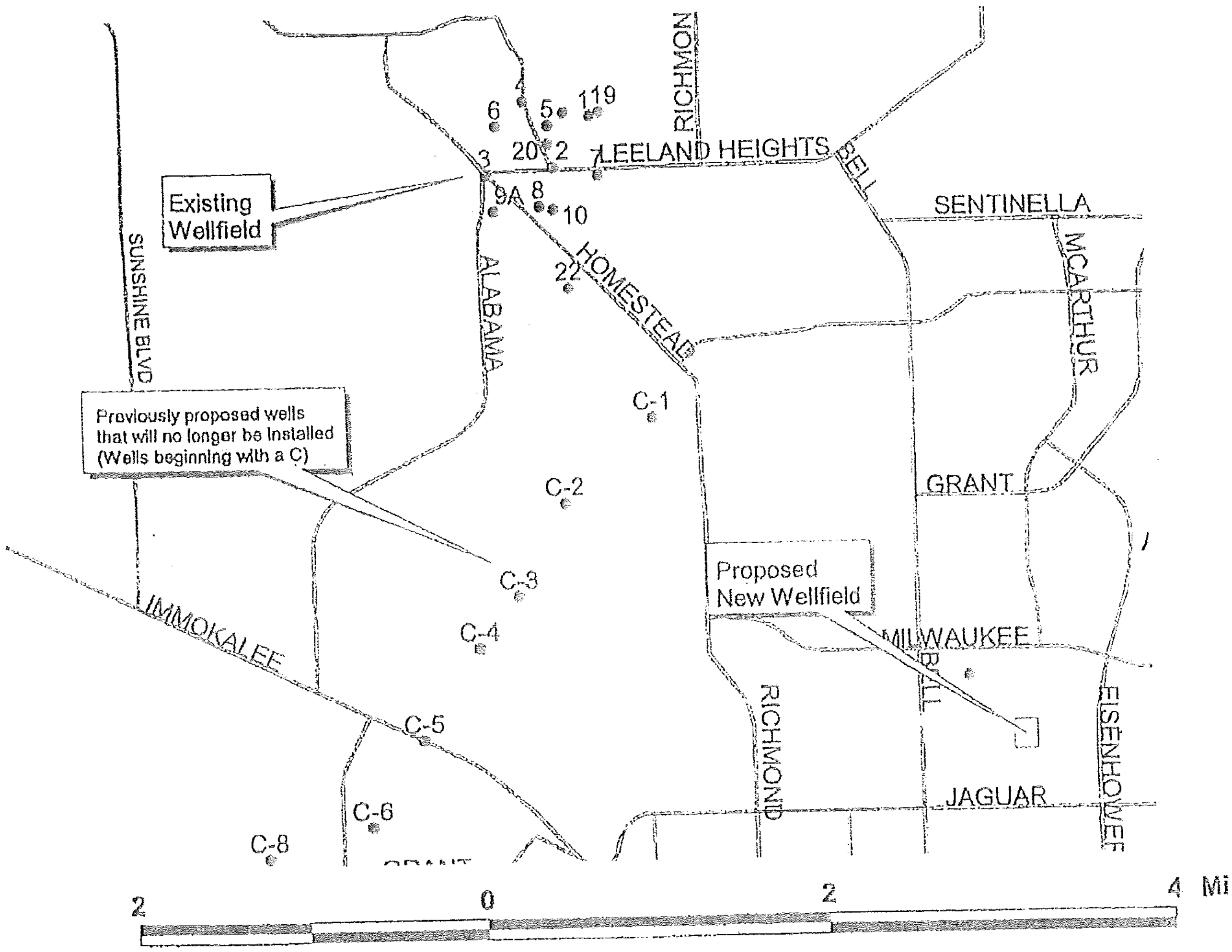
Proposed Water Supply Sources

On, Dec 8, 2006, prior to the expiration date of the existing CUP, FGUA submitted an application to renew and modify the above referenced permit. FGUA has applied for a 20 year permit with a capacity of 7.30 MGD annual average daily flow. In the application FGUA proposes to continue the existing use of the sandstone aquifer currently permitted for 3.3 MGD. The additional 4.0 MGD is proposed to meet future growth and the source will be from an alternative source. In addition FGUA has entered into an agreement with the City of Fort Myers to obtain finished water through an inter-connect.

Proposed Water Supply Facilities

Two water supply facilities will be needed to supply the projected demand. Water Treatment Plant #1 (existing) has a capacity of 3.1 MGD. Water Treatment Plant #2, also known as the Mirror Lakes Water Treatment Plant, will initially produce 1.1 MGD finish water. Withdrawals will be from the Sandstone aquifer. In 2009 WTP#2 will be expanded to 5.0 MGD and treat brackish water from an alternative source (Lower Hawthorne, Mid-Hawthorne, Upper Hawthorne). Pilot testing is currently underway to determine which aquifer will be utilized for future development. Future expansions of WTP#2 will also utilize an alternative source. Timing of these expansions are reflected in the table above.

FGUA Lehigh Acres Wellfields



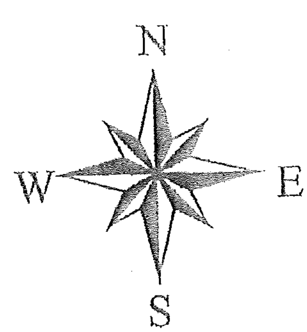


Exhibit 3A

USGS Sandstone Monitor Wells in the Vcinity of the proposed new Lehigh Acres Utilities/FWS Wellfield

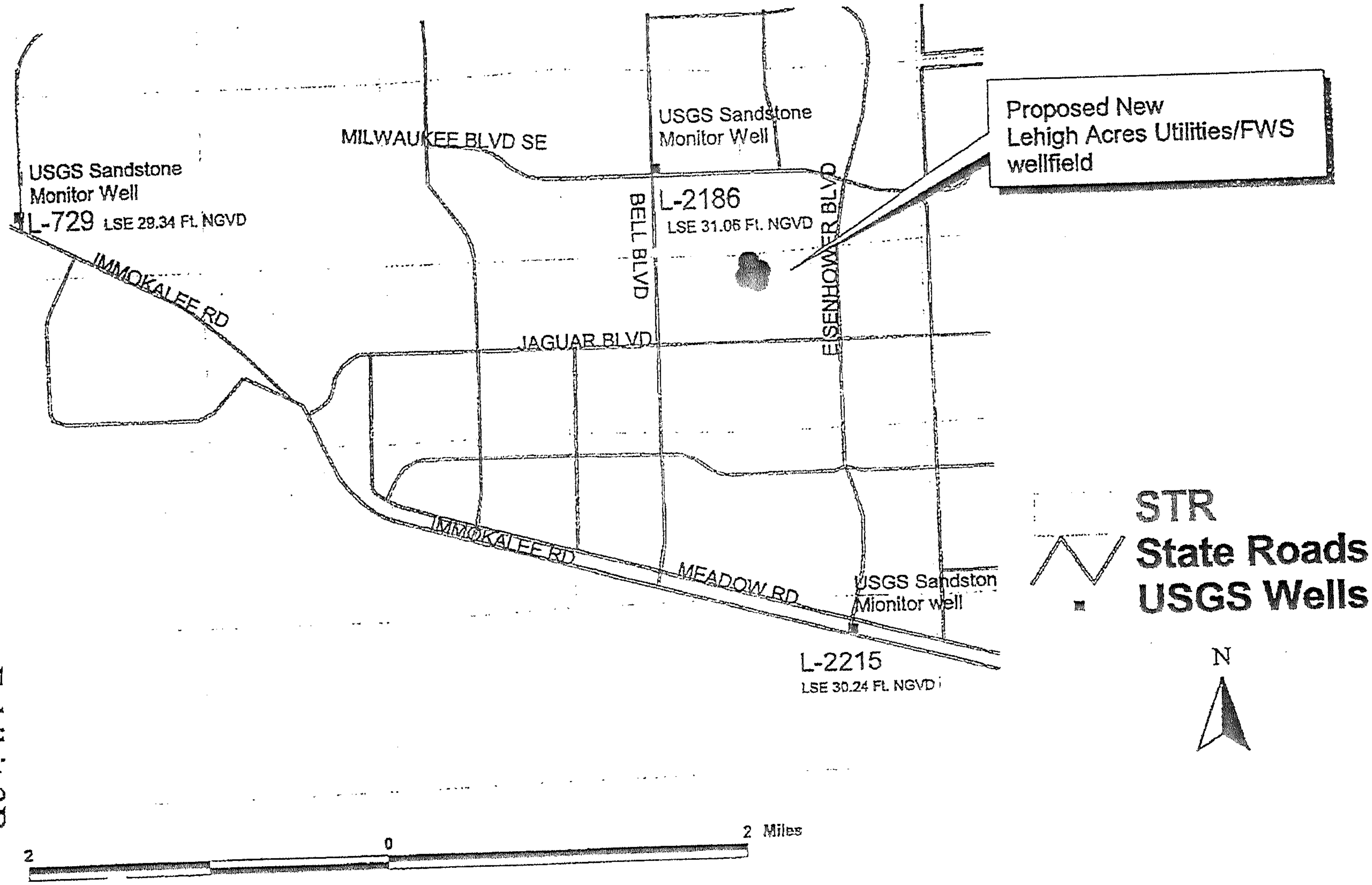
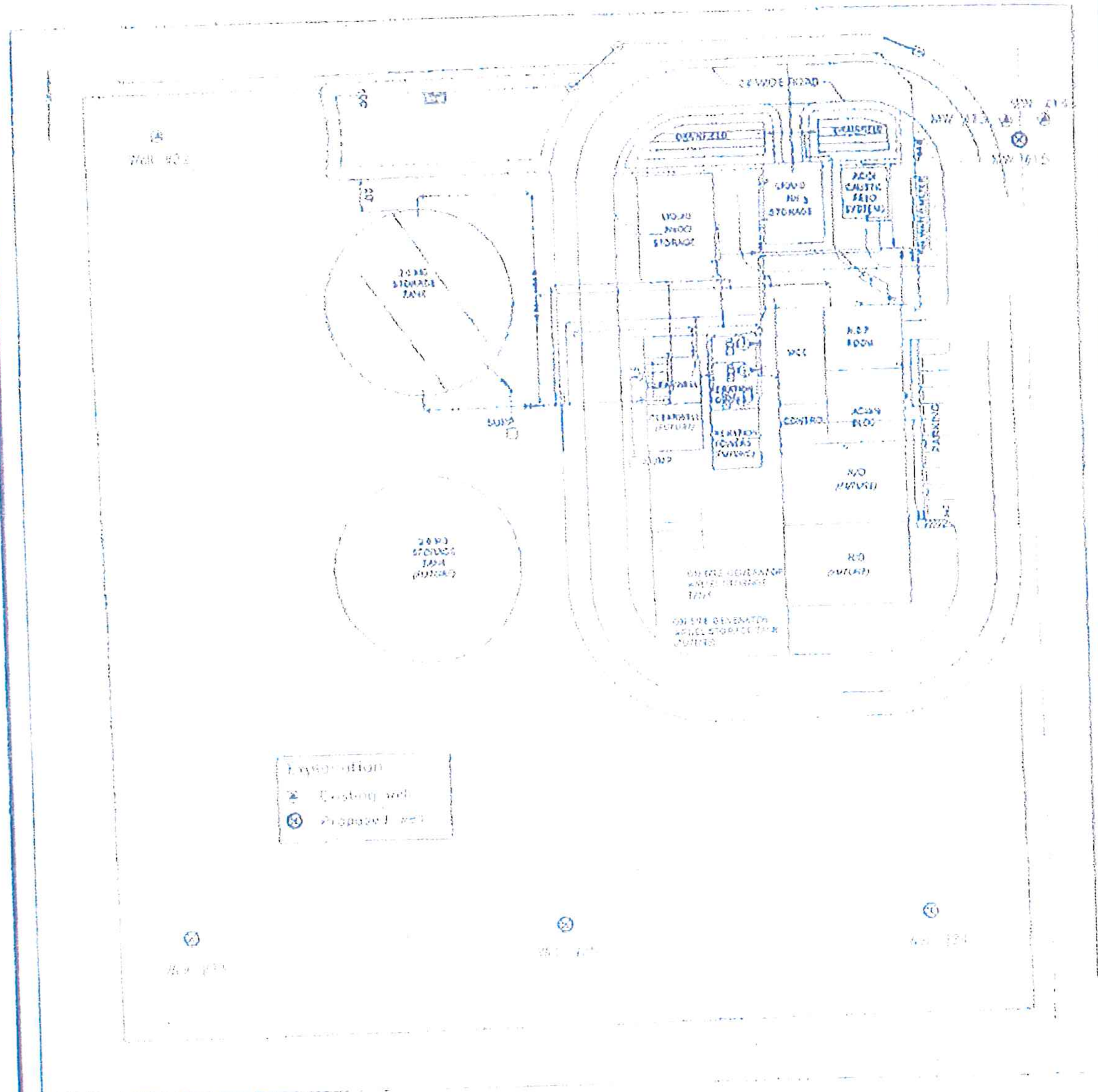


Exhibit 3B



CCI Connect Consulting, Inc. Water Resources Consultants	SITE MAP			FIGURE NUMBER: 1
	FGUA 614 N. Wymore Road Winter Park, FL 32789	Lehigh Acres South Wellfield		
18963 SE Fernwood Dr. Tequesta, FL 33469 561/747-9917	SCALE: 1 in = 100 ft	DRAWN BY: glm	DATE: 1/26/04	

Exhibit 3C

TABLE - A
Description Of Wells.

Application Number: 030521-21

Well ID	32388	32389	32390	32391	32392	32393
Name	1	2	3	4	5	6
Map Designator	1	2	3	4	5	6
FLUWID Number						
Well Field						
Existing/Proposed	E	E	E	E	E	E
Well Diameter(Inches)	6	6	8	8	8	8
Total Depth(feet)	55	69	68	85	66	62
Cased Depth(feet)	50	52	58	60	54	52
Facility Elev. (ft. NGVD)						
Screened Interval From	0	0	0	0	0	0
To	0	0	0	0	0	0
Pumped Or Flowing	P	P	P	P	P	P
Pump Type	turbine	turbine	turbine	turbine	turbine	turbine
Pump Int. Elev. Feet (NGVD)						
Feet (BLS)	0	0	0	0	0	0
Pump Capacity(GPM)	150	150	150	150	150	100
Year Drilled	1955	1962	1970	1970	1962	1970
Planar Location Source	Migrate	Migrate	Migrate	Migrate	Migrate	Migrate
Feet East	448529	447360	445267	446461	447213	445586
Feet North	826905	825368	825155	827396	826643	826635
Accounting Method	unspecified	unspecified	unspecified	unspecified	unspecified	unspecified
Use Status	Primary	Primary	Primary	Primary	Primary	Primary
Water Use Type	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply
Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer

Exhibit No: 8

TABLE - A

Description Of Wells.

Application Number: 030521-21

Well ID	32394	32395	32396	32397	32406	32407
Name	7	8	9A	10	19	20
Map Designator	7	8	9A	10	19	20
FLUWID Number						
Well Field						
Existing/Proposed	E	E	E	E	E	E
Well Diameter(Inches)	8	8	8	8	8	8
Total Depth(feet)	85	80	80	62	90	90
Cased Depth(feet)	57	62	63	55	55	55
Facility Elev. (ft. NGVD)						
Screened Interval From	0	0	0	0	0	0
To	0	0	0	0	0	0
Pumped Or Flowing	P	P	P	P	P	P
Pump Type	turbine	turbine	turbine	turbine	turbine	turbine
Pump Int. Elev. Feet (NGVD)						
Feet (BLS)	0	0	0	0	0	0
Pump Capacity(GPM)	200	250	200	350	200	200
Year Drilled	1970	1970	1970	1989	1999	9999
Planar Location Source	Migrate	Migrate	Migrate	Migrate	REVIEWER	REVIEWER
Feet East	448758	446918	445479	447344	448825	447202
Feet North	825106	824182	824043	824084	827042	826073
Accounting Method	unspecified	unspecified	unspecified	unspecified	other	other
Use Status	Primary	Primary	Primary	Primary	Primary	Primary
Water Use Type	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply
Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer

Exhibit No: 8

TABLE - A

Description Of Wells.

Application Number: 030521-21

Well ID	131113	145779	145783	145784	145788	138650
Name	21	Well 22	Well 23	Well 24	Well 25	L-2186
Map Designator	21	Well 22	Well 23	Well 24	Well 25	
FLUWID Number						
Well Field						
Existing/Proposed	E	E	P	P	P	E
Well Diameter(Inches)	10	12	12	12	12	
Total Depth(feet)	100	180	180	180	180	150
Cased Depth(feet)	60	70	80	80	80	133
Facility Elev. (ft. NGVD)	20	30	30	30	30	
Screened Interval From						
To						
Pumped Or Flowing	P	P	P	P	P	
Pump Type	unspecified	submersible	submersible	submersible	submersible	none
Pump Int. Elev. Feet (NGVD)		-40	-40	-40	-40	
Feet (BLS)		70	79	70	70	
Pump Capacity(GPM)	300	500	500	500	500	0
Year Drilled	2003	2003	2004	2004	2004	
Planar Location Source	REVIEWER	DIGITIZED	DIGITIZED	DIGITIZED	DIGITIZED	
Feet East	447707	461398	461414	462021	461726	
Feet North	827017	808162	807510	807499	807518	
Accounting Method	flow meter	flow meter	flow meter	flow meter	flow meter	none
Use Status	Primary	Primary	Primary	Primary	Primary	Monitor
Water Use Type	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply	Monitor
Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer

Exhibit No: 8

TABLE - A .
Description Of Wells.

Application Number: 030521-21

Well ID	138651	138652	145789	146772	146773
Name	L-2215	L-729	MW-13	MW-14	MW-15
Map Designator			MW-13		
FLUWID Number					
Well Field					
Existing/Proposed	E	E	P	P	P
Well Diameter(inches)			4	4	4
Total Depth(feet)	149	103	180	94	20
Cased Depth(feet)	99	81	145	54	15
Facility Elev. (ft. NGVD)					
Screened Interval From					
To					
Pumped Or Flowing				F	
Pump Type	none	none	none	none	none
Pump Int. Elev. Feet (NGVD)					
Feet (BLS)					
Pump Capacity(GPM)	0	0	0	0	0
Year Drilled			2004	2004	2004
Planar Location Source			DIGITIZED		
Feet East			461971		
Feet North			808147		
Accounting Method	none	none	none	none	none
Use Status	Monitor	Monitor	Monitor	Monitor	Monitor
Water Use Type	Monitor	Monitor	Monitor	Monitor	Monitor
Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Sandstone Aquifer	Water Table Aquifer

Exhibit No: 8

Public Water Supply Demands

Application Number: 030521-21

Service Area: LEHIGH ACRES, EASTERN LEE COUNTY

Treatment Name:

Standard PCUR: 67

Standard Max Monthly Ratio: 1.12

System Efficiency:

Standard Max Day Ratio:

Past Water Use (Table-F):

Year	Population	PCUR	Average Use (MGD)	Max Day Use (MGD)	Ratio	Average Monthly Use(MG)	Max Monthly Use (MG)	Ratio	Basis For Demand	Basis For Ratio
1998	22,275	57	1.28			38.91	41.10	1.06	Y	
1999	22,699	64	1.46			44.32	48.04	1.08	Y	
2000	22,843	71	1.61			49.04	53.57	1.09	Y	Y
2001	23,513	73	1.71			52.04	55.84	1.07	Y	Y
2002	25,119	68	1.72			52.14	62.12	1.19	Y	Y

Projected Water Use(Table-G):

Year	Population	PCUR	Recommended Average (MGD)	Recommended Max Day (MGD)	Ratio	Average Monthly Use(MG)	Rec Max Monthly (MG)	Ratio	Basis for Allocation
2003	26,833	71	1.91			57.92	67.83	1.17	
2004	28,667	81	2.32			70.59	82.8	1.17	
2005	30,623	91	2.79			84.72	99.6	1.18	
2006	32,714	101	3.30			100.45	111.494	1.11	Y

Exhibit No:9

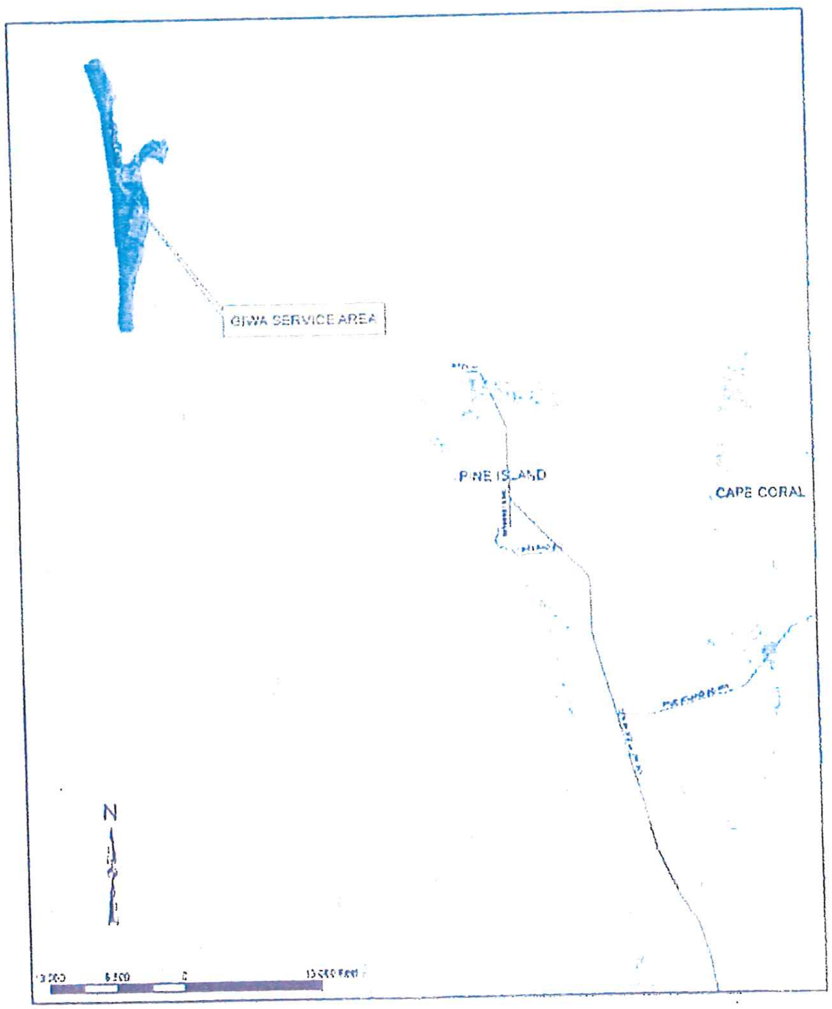
SECTION 7.3
GASPARILLA ISLAND WATER ASSOCIATION

GASPARILLA ISLAND WATER ASSOCIATION

Service Area

The Gasparilla Island Water Association (GIWA) serves potable water to the Gasparilla Island and a small portion of the mainland in Charlotte County. GIWA serves water customers in both Charlotte County and Lee County. The GIWA service area within unincorporated Lee County is shown below. GIWA has calculated that 59.8% of the units they serve are within un-incorporated Lee County. However based on water demand data for fiscal year 2006-2007, 76.4% of the water produce by GIWA was used in the Lee County portion of their service area.

Gasparilla Island Water Association
Water Service Area in Lee County



Consumptive Use Permit

GIWA has a Consumptive Use Permit issued by Southwest Florida Water Management District (SWFWMD). A summary of the general permit information is presented below.

Permit Number: 718.008
Issued: June 26, 2001
Expires: June 26, 2011
Annual Average Allocation: 1,537,600 gallons per day
Peak Daily Allocation: 1,952,800 gallons per day

Existing Water Supply

GIWA currently utilizes reverse osmosis treatment to treat brackish raw water from an intermediate aquifer. SWFWMD records indicate that the permitted annual average withdrawal from this source is 1,076,300 gallons per day. GIWA also utilizes surficial aquifer wells for raw water and provides treatment for color removal from this wellfield. SWFWMD records indicate that the permitted annual average withdrawal from the surficial aquifer is 461,300 gallons per day. In addition, GIWA has an interconnect with Charlotte County Utilities.

Demand Projections

Demand Projections for GIWA are presented below. The data in this table was provided by GIWA and was developed in support of their application to renew the above referenced consumptive use permit. GIWA projects that Gasparilla Island will reach build-out by 2011. In addition, GIWA has informed Lee County that areas served by GIWA in Charlotte County are being turned over to Charlotte County Utilities.

Gasparilla Island Water Association Projected Water Use

Year	Funcional Population	Gross Per Capita Water Use (gpcd)	Projected Gross Water AADF (gpd)	Projected Treatment Loss (%)	Projected Raw Water AADF (gpd)	Peak Factor	Projected Peak Month ADF (gpd)
2005	4,449	262	1,165,638	23%	1,513,816	1.27	1,922,546
2006	4,461	262	1,168,782	23%	1,517,899	1.27	1,927,731
2007	4,472	262	1,171,664	23%	1,521,642	1.27	1,932,485
2008	4,483	262	1,174,546	23%	1,525,384	1.27	1,937,238
2009	4,496	262	1,177,952	23%	1,529,808	1.27	1,942,856
2010	4,507	262	1,180,834	23%	1,533,551	1.27	1,947,609
2011	4,519	262	1,183,978	23%	1,537,634	1.27	1,952,795

Proposed Water Supply Sources

GIWAS plans one last expansion of their reverse osmosis treatment facility and related raw water supply to add an additional 170,000 gallons per day. The utility is also planning to conduct an analysis of options for future water supplies in the event their shallow water wellfield is impacted by salt water intrusion.

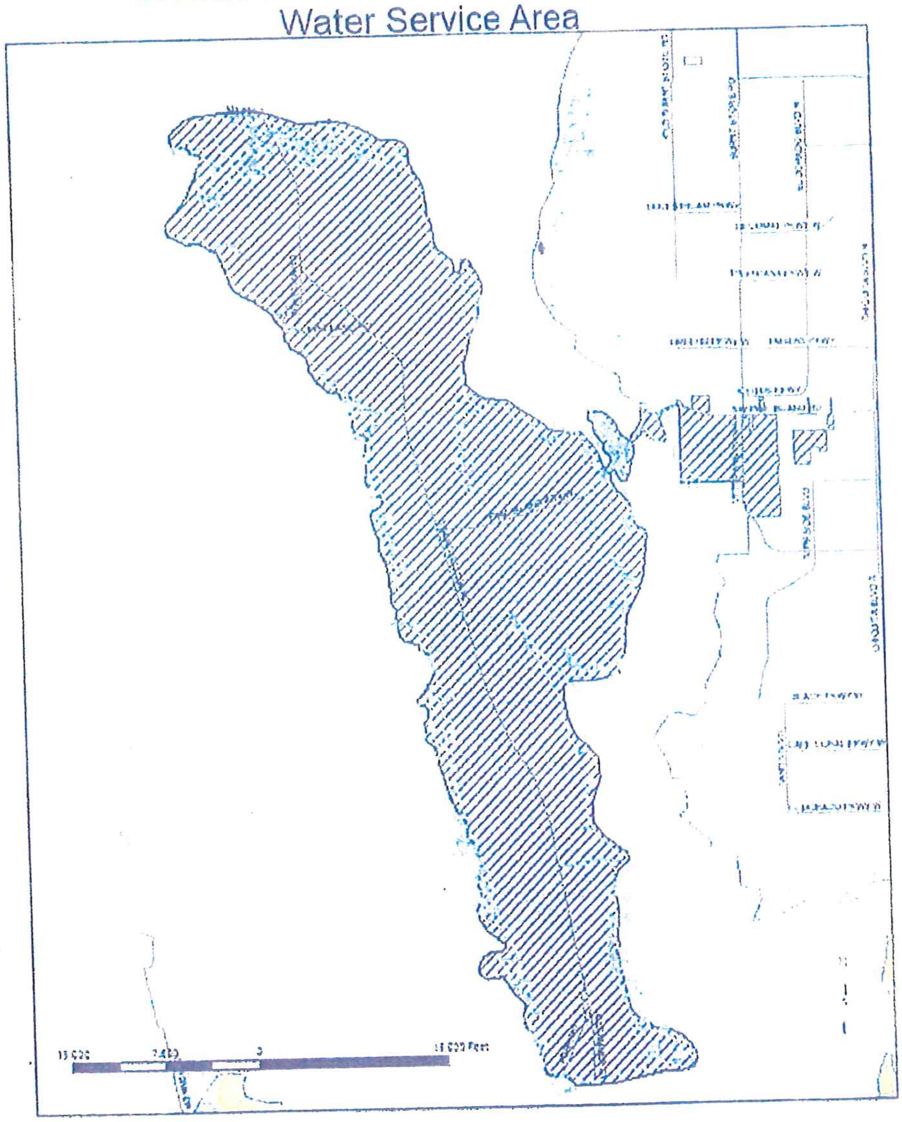
SECTION 7.4
GREATER PINE ISLAND WATER ASSOCIATION

Greater Pine Island Water Association

Service Area

The Greater Pine Island Water Association (GPIWA) serves potable water to the islands of Matlacha as well as Pine Island proper. Also included in the GPIWA service area is a small portion of the mainland. The GPIWA service area is shown below.

Greater Pine Island Water Association
Water Service Area



Consumptive Use Permit

GPIWA has a Consumptive Use Permit issued by the SFWMD. A summary of the general permit information is presented below.

Permit Number: 36-00045-W
Issued: October 12, 2005
Expires: October 12, 2015

Annual Allocation:	890 Million Gallons (890/365= 2.44 MGD AADF)
Maximum Monthly Allocation:	97.1 Million Gallons (97.1/30 = 3.24 MGD)

Existing Water Supply

The GPIWA wellfield on Pine Island consist of 4 Lower Hawthorne wells that are 12" in diameter. Each well is rated at 700 gallons per minute for a total well capacity of 2,800 gallons per minute. The location of these existing wells, is shown on the attached copy of Figure 6-1 from GPIWA's consumptive use permit staff report. A description of these wells is shown on the attached copy of Table A, labeled Exhibit No: 7 from GPIWA's consumptive use permit staff report.

Treatment Facility
Raw water from the wellfield is treated at GPIWA's Reverse Osmosis Treatment Plant. The plant is permitted to treat 2.25 MGD. The location of this facility is also shown on Figure 6-1 reference above. A deep injection well at the plant site is used for concentrate disposal.

Storage Facilities
Storage facilities along with their capacities are shown on the attached copy of Figure 1-2 from GPIWA's consumptive use permit staff report.

Demand Projections

Finished water demand projections are presented in the table below. This demand projection was supplied by GPIWA.

GREATER PINE ISLAND WATER ASSOCIATION
WATER DEMAND PROJECTION

Year	Water Demand ADF-MGD
2006	1.659
2007	1.742
2008	1.829
2009	1.92
2010	2.017
2011	2.117
2012	2.223
2013	2.334
2014	2.451
2015	2.574
2016	2.702
2017	2.837

Proposed Water Supply Sources

GPIWA plans to construct a fifth Lower Hawthorne aquifer production well to meet future needs. The proposed well is planned to be 783 feet deep and have a capacity of 700 gallons per minute, bringing the total pumping capacity of the wellfield to 3,500 gallons per minute. This wells is projected to be on-line in 2009.

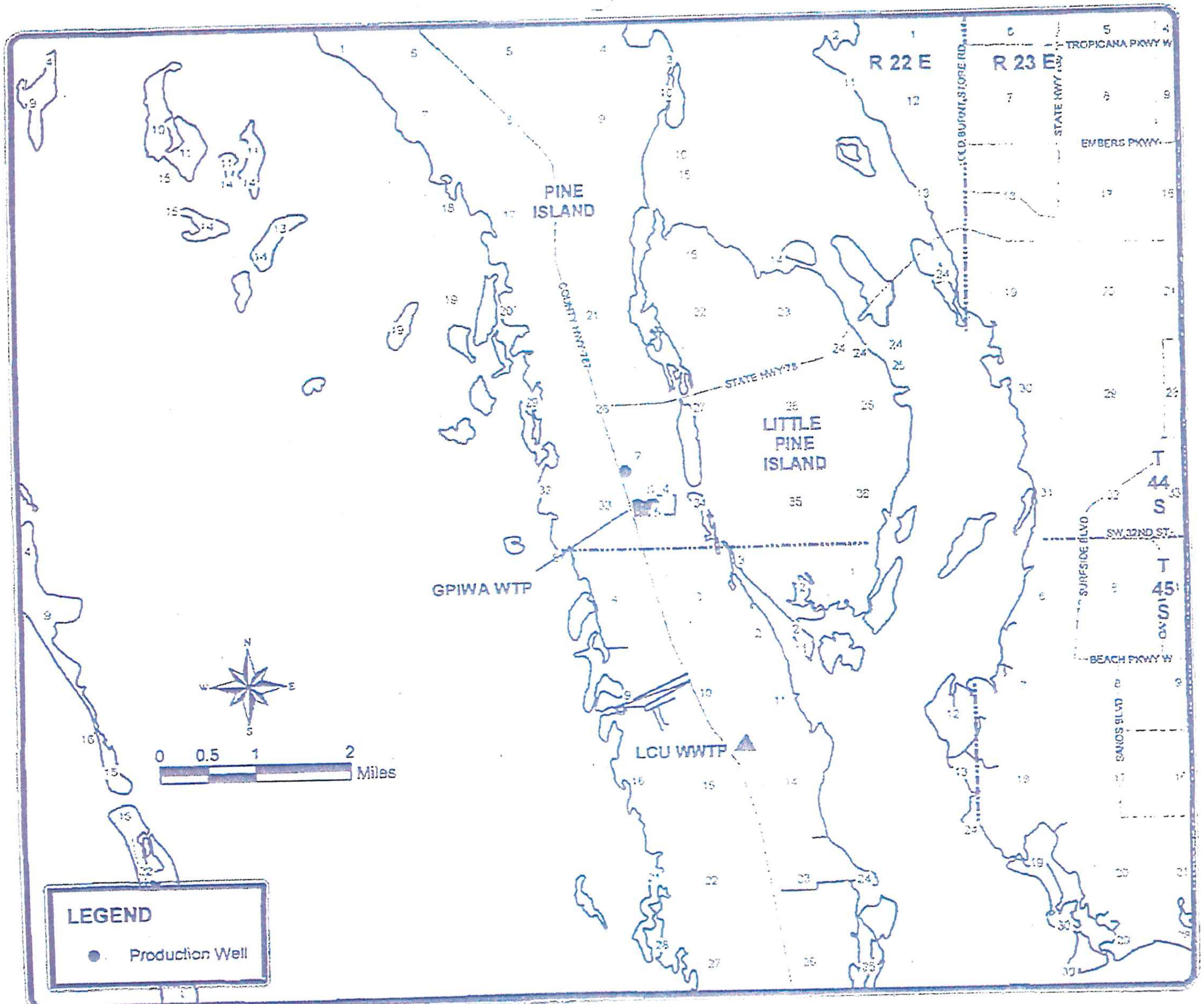


FIGURE 6-1. MAP SHOWING EXISTING GPIWA PRODUCTION WELLS

EXHIBIT 5

Exhibit No: 7

TABLE - A

Description Of Wells.

Application Number: 050524-9

Well ID	22056	22057	22058	22059	184315
Name	RO-4	RO-5	RO-6	RO-7	RO-8
Map Designator	4	5	6	7	7
FLUWID Number					
Well Field					
Existing/Proposed	E	E	E	E	P
Well Diameter(inches)	12	12	12	12	12
Total Depth(feet)	739	770	737	783	770
Cased Depth(feet)	583	563	598	598	600
Facility Elev. (ft. NGVD)					
Screened Interval From	0	0	0	0	
To	0	0	0	0	
Pumped Or Flowing	P	P	P	P	P
Pump Type	submersible	submersible	submersible	submersible	submersible
Pump Int. Elev. Feet (NGVD)					
Feet (BLS)	0	0	0	0	0
Pump Capacity(GPM)	700	700	700	700	700
Year Drilled	1991	1991	1992	2001	
Planar Location Source	Migrate	Migrate	Migrate	Migrate	Migrate
Feet East	293103	292839	292666	292295	293157
Feet North	824786	824315	824791	826006	822453
Accounting Method	totalizer	totalizer	totalizer	totalizer	totalizer
Use Status	Primary	Primary	Primary	Primary	Primary
Water Use Type	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply	Public Water Supply
Aquifer	Lower Hawthorn Aquifer	Lower Hawthorn Aquifer	Lower Hawthorn Aquifer	Lower Hawthorn Aquifer	Lower Hawthorn Aquifer

Public Water Supply Demands

Application Number: 050524-9

Service Area: GREATER PINE ISLAND
Treatment Name: RO Membrane
Standard PCUR: 98

System Efficiency: 78%

Standard Max Monthly Ratio: 1.31

Standard Max Day Ratio:

Past Water Use (Table-F):

Year	Population	PCUR	Average Use (MGD)	Max Day Use (MGD)	Ratio	Average Monthly Use(MG)	Max Monthly Use (MG)	Ratio	Basis For Demand	Basis For Ratio
1999	11,787	94	1.11			33.72	45.27	1.34	Y	
2000	11,999	100	1.20			36.40	48.26	1.33	Y	Y
2001	12,273	100	1.23			37.33	49.12	1.32	Y	Y
2002	12,550	95	1.19			36.11	47.61	1.32		
2003	12,950	90	1.16			35.36	45.50	1.29		
2004	13,197	98	1.30			39.47	50.95	1.29	Y	Y

Projected Water Use(Table-G):

Year	Population	PCUR	Recommended Average (MGD)	Recommended Max Day (MGD)	Ratio	Average Monthly Use(MG)	Rec Max Monthly (MG)	Ratio	Basis for Allocation
2005	13,260	98	1.30			39.50	51.7505	1.31	
2006	14,178	98	1.39			42.24	55.3332	1.31	
2007	15,102	98	1.48			44.99	58.9394	1.31	
2008	16,030	98	1.57			47.76	62.5611	1.31	
2009	16,965	98	1.66			50.54	66.2102	1.31	
2010	17,905	98	1.75			53.34	69.8788	1.31	
2011	18,197	98	1.78			54.21	71.0184	1.31	
2012	18,495	98	1.81			55.10	72.1814	1.31	
2013	18,801	98	1.84			56.01	73.3756	1.31	
2014	19,111	98	1.87			56.94	74.5855	1.31	
2015	19,427	98	1.90			57.88	75.8188	1.31	Y

Exhibit No:8

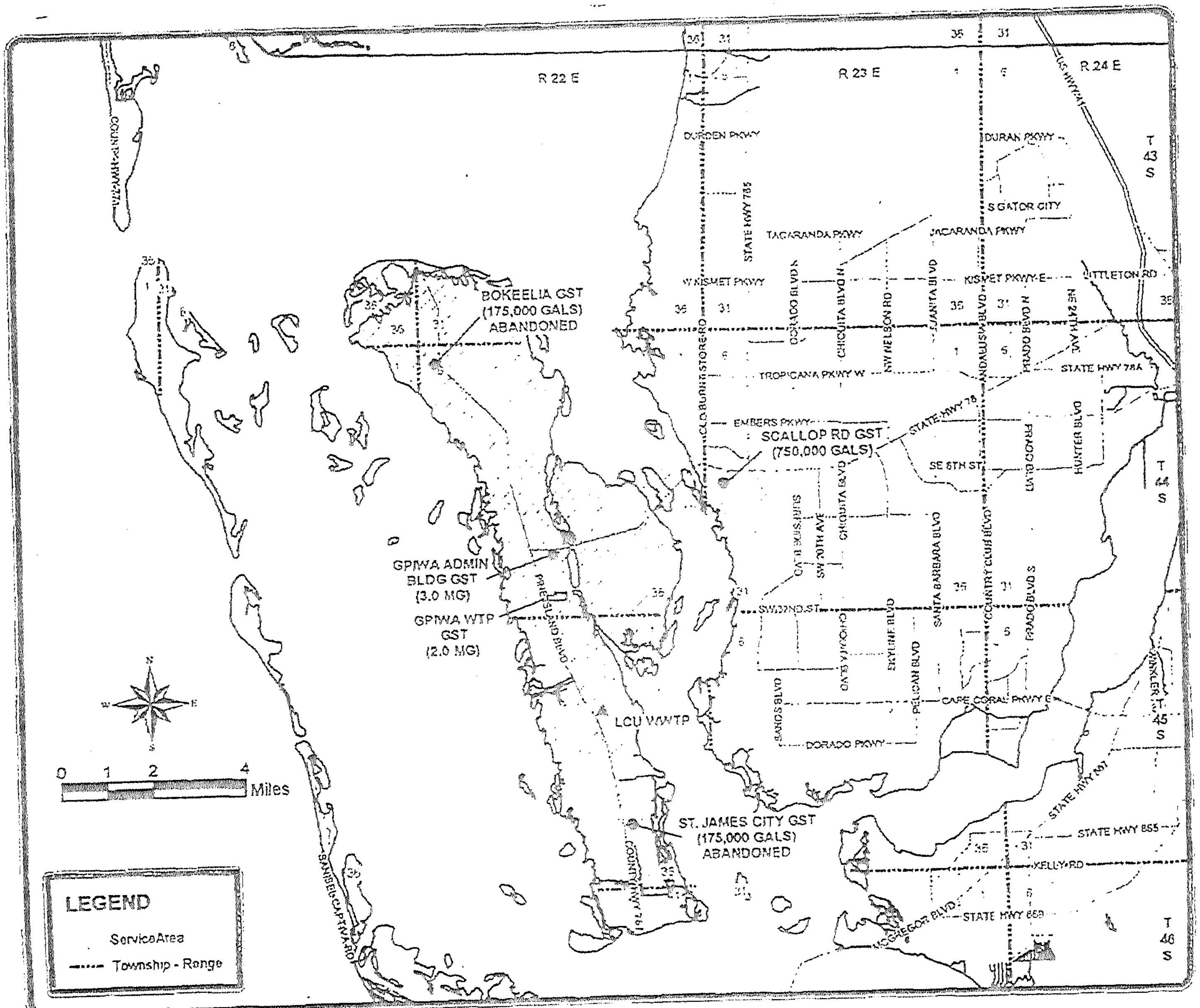


FIGURE 1-2. MAP SHOWING GPIWA SERVICE AREA

EXHIBIT 4

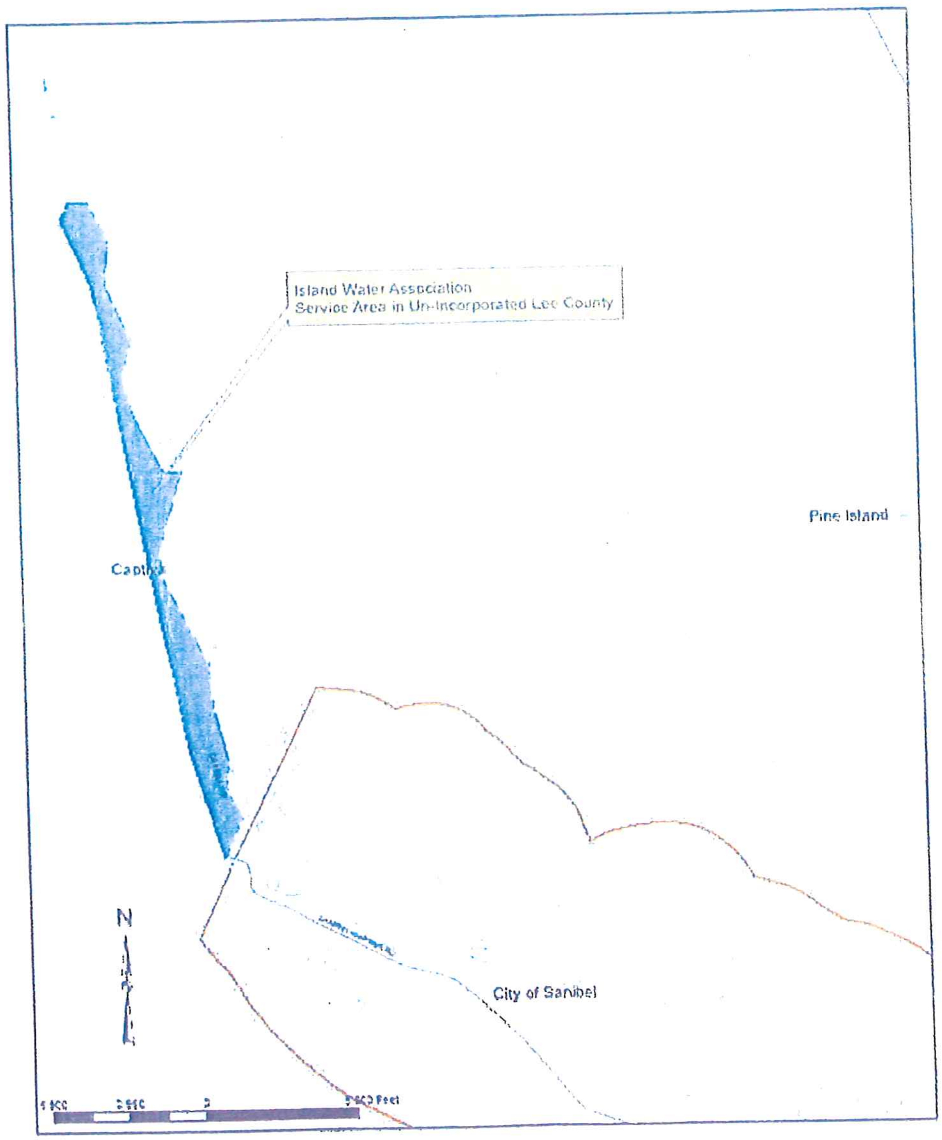
SECTION 7.5
ISLAND WATER ASSOCIATION

ISLAND WATER ASSOCIATION

Service Area

The Island Water Association (IWA) provides water service to Sanibel Island and Captiva Island. IWA serves areas within the City of Sanibel and Un-Incorporated Lee County. The IWA service area located within unincorporated Lee County is shown on the figure below. IWA has calculated that the unincorporated Lee County portion of its service area accounts for 25% of its potable water demand.

Island Water Association
Water Service Area in Lee County



Consumptive Use Permit

IWA has a Consumptive Use Permit issued by South Florida Water Management District (SFWMD). A summary of the general permit information is presented below.

Permit Number: 36-00034-W
Issued: November 13, 1997
Expires: November 13, 2017
Annual Allocation: 1809 Million Gallons (1809/365 = 4.96MGD AADF)
Maximum Daily Allocation: 8.08 MGD

Existing Water Supply

The IWA wellfield on Sanibel Island consists of 8 Floridan aquifer wells and 10 Lower Hawthorne aquifer wells. These wells range in diameter from 6" to 10". The capacity of the wells range from 30 gallons per minute (gpm) to 525 gpm. The total capacity of the 18 wells is 6460 gpm. The depths of these wells range from 605 feet to 770 feet. The location of these wells is depicted in the attached figure labeled Exhibit 4 from IWA's consumptive use permit staff report. IWA maintains an interconnect with Greater Pine Island Water Association. The location of this interconnect is depicted on the attached map titled "IWA Facilities and Service Area" provided by IWA.

Treatment Facility

Raw water from the brackish water wellfield is treated at the IWA's Reverse Osmosis Treatment Plant. The plant has a permitted capacity of 4.7 MGD. Concentrate disposal for the facility is provided through a discharge to the Gulf of Mexico.

Storage Facilities

The location of storage facilities in IWA's system along with their capacities are shown on the attached map titled "IWA Facilities and Service Area" provided by IWA.

Demand Projections

Raw Water demand projections are presented in the table below. This demand projection was supplied by IWA and is in Table F&G of the IWA's consumptive use permit staff report.

ISLAND WATER ASSOCIATION
WATER DEMAND PROJECTION

Year	Permanent Population	Per Capita Usage	Demand AADF (MGD)	Demand Maximum Day (MGD)
2005	7,753	556	4.31	7.02
2006	7,866	554	4.36	7.11
2007	7,979	553	4.41	7.19
2008	8,092	552	4.47	7.28
2009	8,206	551	4.52	7.37
2010	8,318	550	4.58	7.46
2011	8,431	549	4.63	7.56
2012	8,545	548	4.68	7.64
2013	8,657	547	4.74	7.72
2014	8,771	546	4.79	7.81
2015	8,884	546	4.85	7.9
2016	8,997	545	4.9	7.99
2017	9,110	544	4.96	8.08

Proposed Water Supply Sources

IWA plans to install 3 additional Floridan aquifer wells. The wells are proposed to be 10" in diameter, each with a capacity of 525 gallons per minute which will provide an additional 2.27 MGD. These wells are included in IWA's current consumptive use permit.

Note

It should be noted that the information provided above included the entire service area for IWA. The unincorporated portion of this service area only represents approximately 25% of the total.

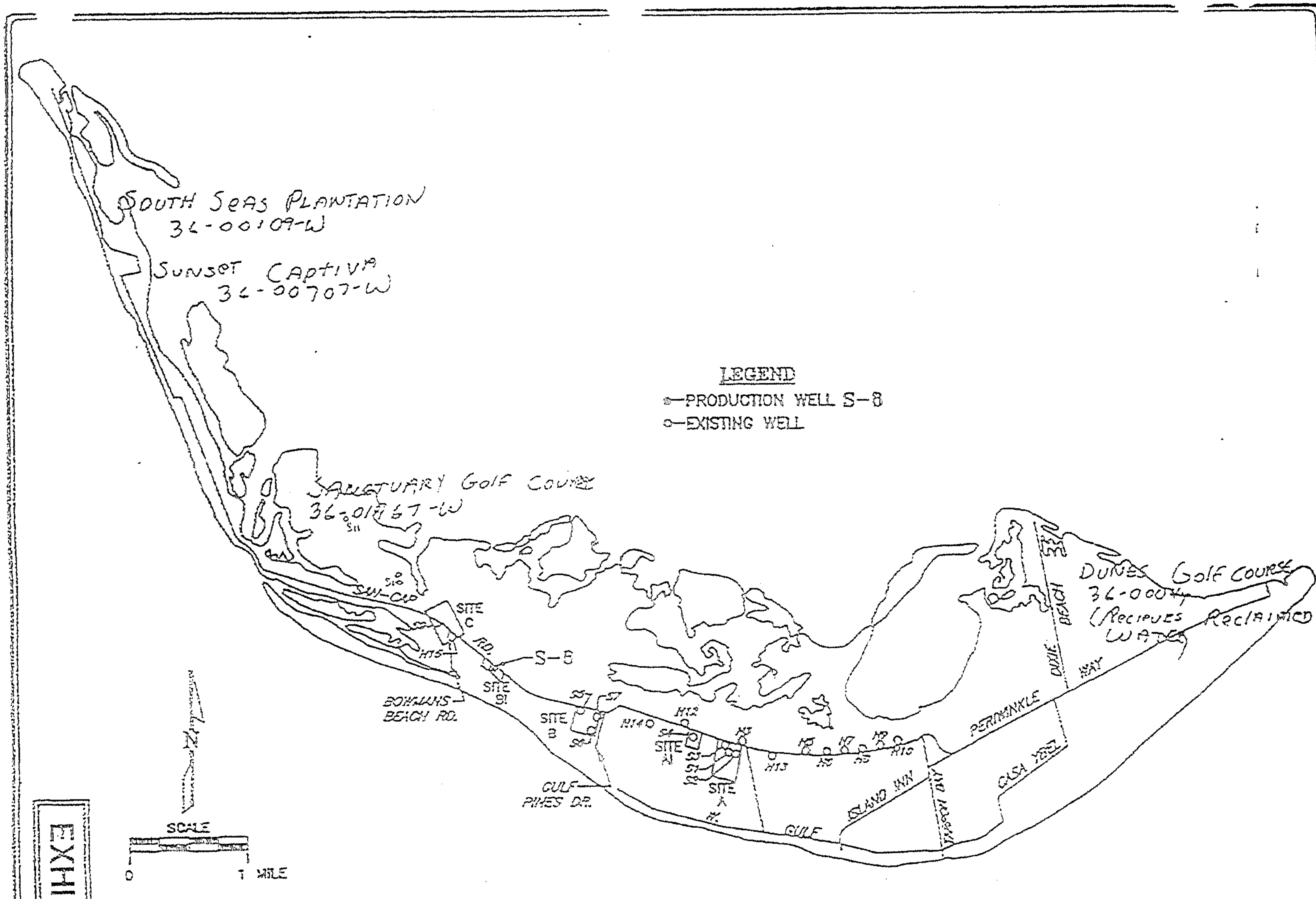


EXHIBIT 4

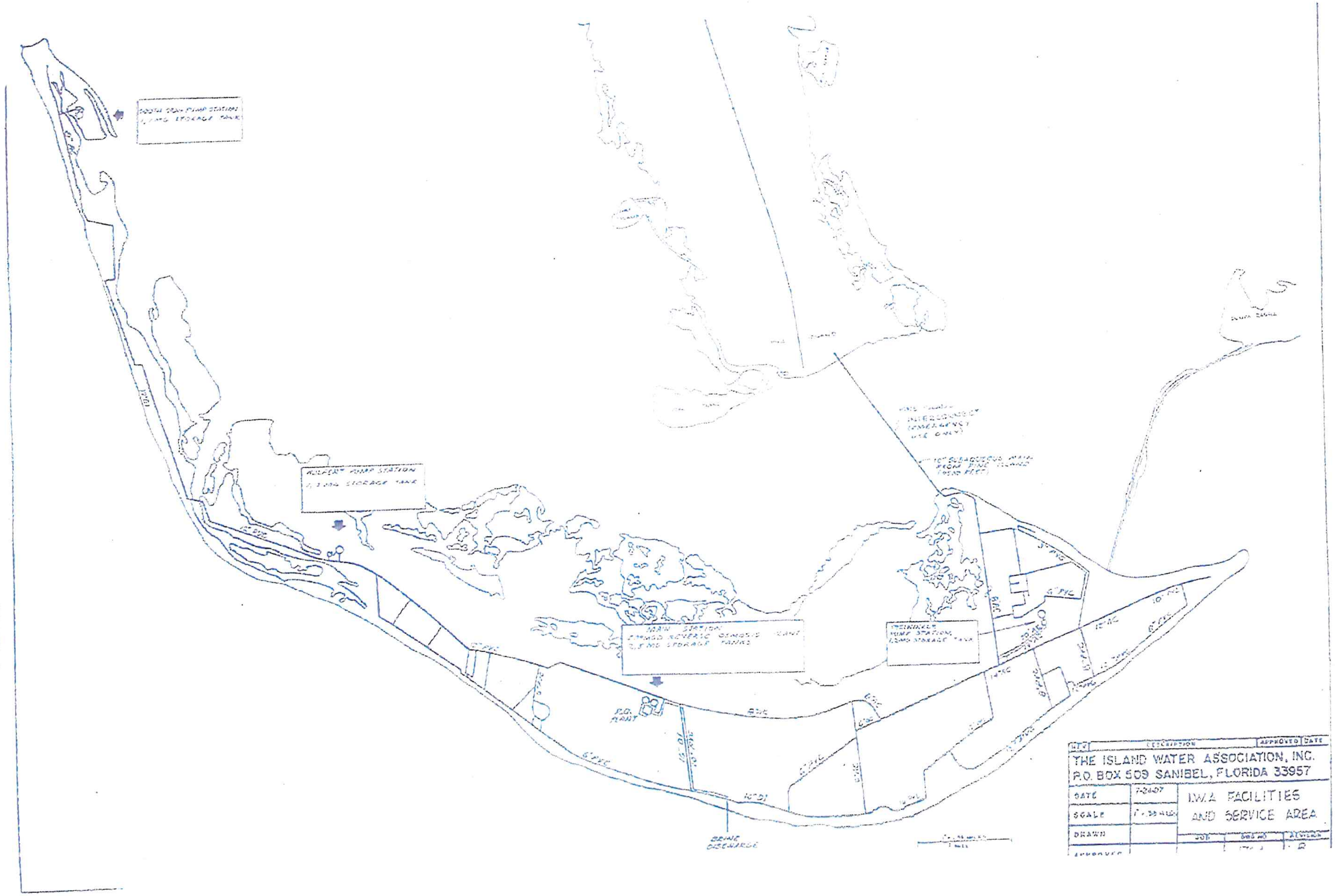
ENVIRONMENTAL AND GROUNDWATER SERVICES

DRN. BY: TWO DWG NO. A-C1629SIT-3 DATE: 4/7/92

PROJECT NAME: IWA S-8 WELL PROJECT NUMBER: CH1-629

Missimer & Associates, Inc.

FIGURE 2-1. MAP SHOWING THE LOCATION OF IWA PRODUCTION WELLS.


MAIN STATION
BRINE DISCHARGE
THE ISLAND WATER ASSOCIATION, INC.
P.O. BOX 509 SANIBEL, FLORIDA 33957
DATE
SCALE
DRAWN
I.W.A FACILITIES
AND SERVICE AREA

WATER SUPPLY FACILITIES WORK PLAN
LEE COUNTY UTILITIES
LEE COUNTY, FLORIDA

Section 8
DOMESTIC SELF-SUPPLY

DOMESTIC SELF-SUPPLY

The largest concentration of Domestic Self-Supply (DSS) wells in Lee County is located in the Lehigh Acres community. Florida Governmental Utility Authority (FGUA) is the utility provider for this area of the County. FGUA's 2008-2012 Capital Program includes water treatment capacity expansions which will assist in reducing the reliance of private wells for potable water in the Lehigh Acres area.

It is expected that future domestic self supply will occur outside of the future service areas of Lee County's utility providers. These areas are mainly the northern portions of Lee County and the Density Reduction/Groundwater Resource area in the southeast area of Lee County.

Lee County Planning staff projects that in the year 2030 there will be 19,602 permanent and 3,294 seasonal residents living in areas with domestic self supplied water. This projection only includes residents not within a franchise area. The projection uses the adopted 2030 population from the Lee Plan which is based on the BEBR mid-range projection from Florida Population Studies, 2006 Projections of Florida Population published February 2006. Planning staff has disaggregated this population projection by the 22 Planning Communities and then by the Future Land Use Map designations. From this breakdown, staff was able to aggregate the projection population to the anticipated areas of domestic self supplied water.

A map depicting the Lee County Utilities future service area as well as other utility franchise areas is provided on the following page. Parcels with domestic self-supplied utilities located outside of a franchise area are identified on the map.

The Lee County Division of Natural Resources currently maintains an ongoing database of permitted wells in unincorporated Lee County. The database is updated on a monthly basis. At this time it is estimated that there is a domestic self-supply consumption rate of 100 gallons per day per person. Currently the Lee County Division of Natural Resources staff is working with a consultant to refine a projection for the number of gallons used per day.

LEE COUNTY

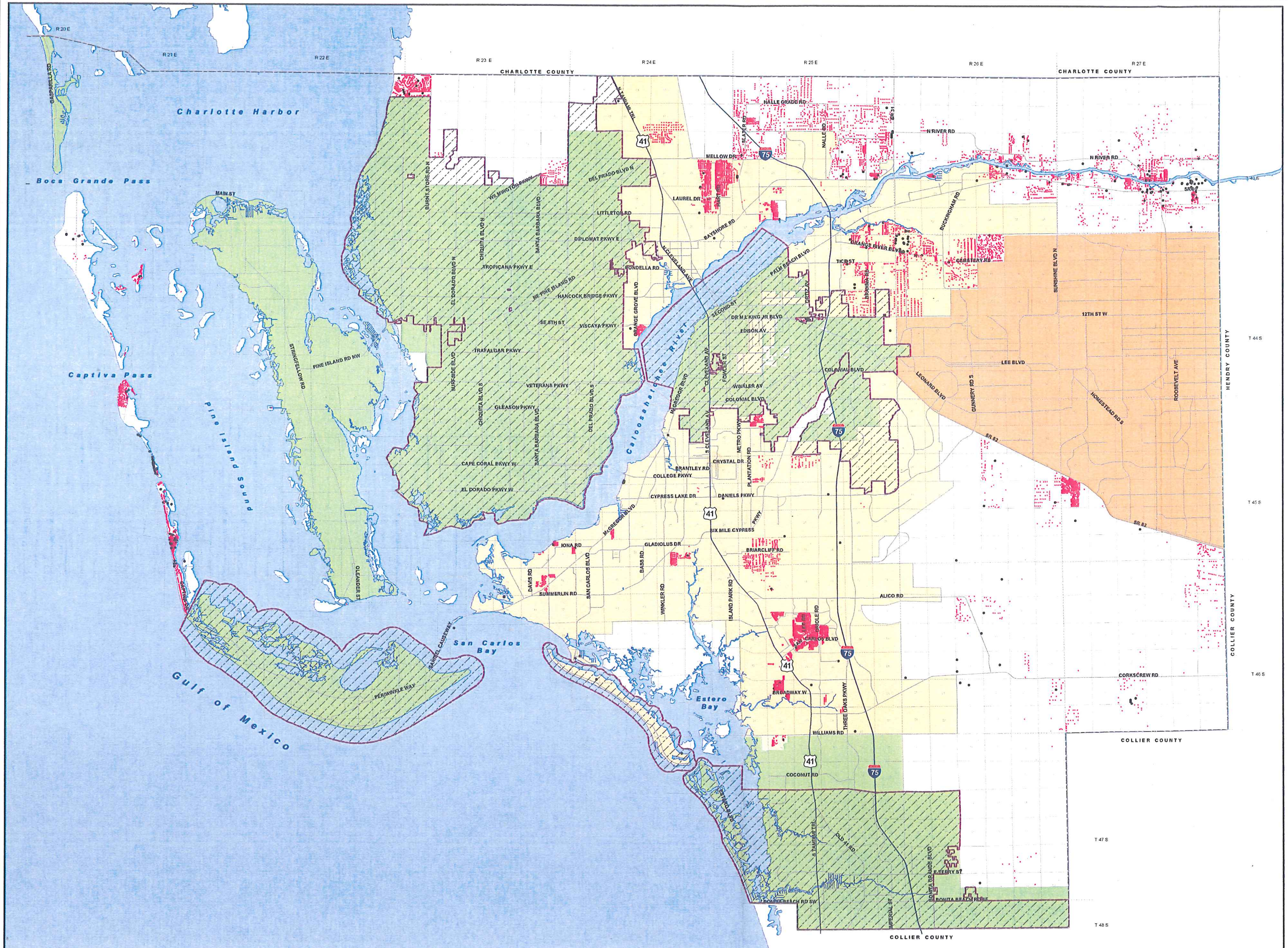
Parcels With Domestic Self-Supplied Water Utilties

Existing Land Use

- Residential Use
- Other Uses
- City Limits

Franchise Name

- FGUA Franchise Area
- Other Franchise Area
- Lee County Future Water Service Area



LEE COUNTY
SOUTHWEST FLORIDA
DIVISION OF PLANNING

N S E W

0.8 0.4 0 0.8 1.6 2.4 3.2
Miles

Map Generated: November 2008
City Limits current to date of map generation

Figure 1
Lee County Utilities
Potential Service Area

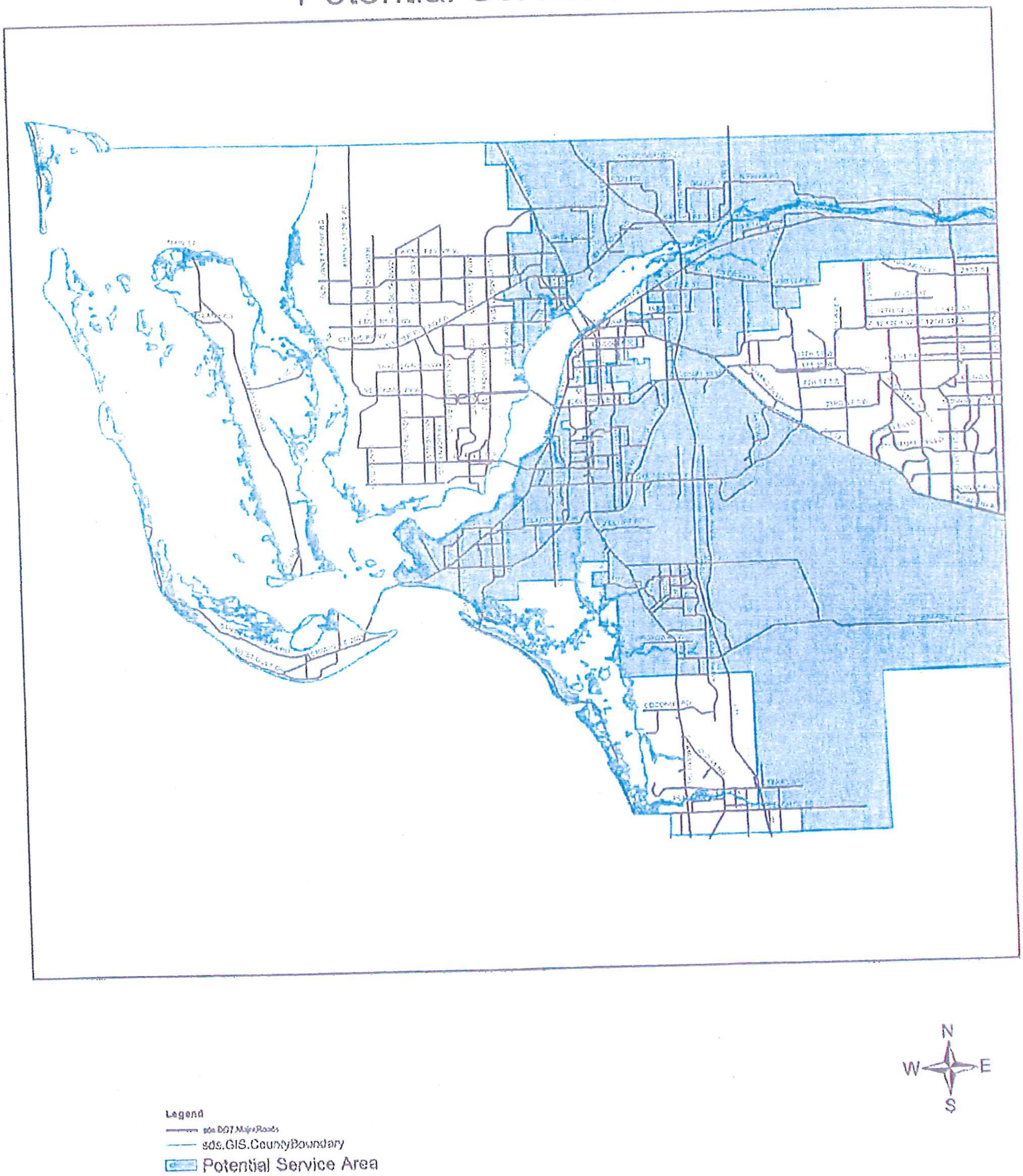


FIGURE 2

Lee County Utilities
Current Area Served

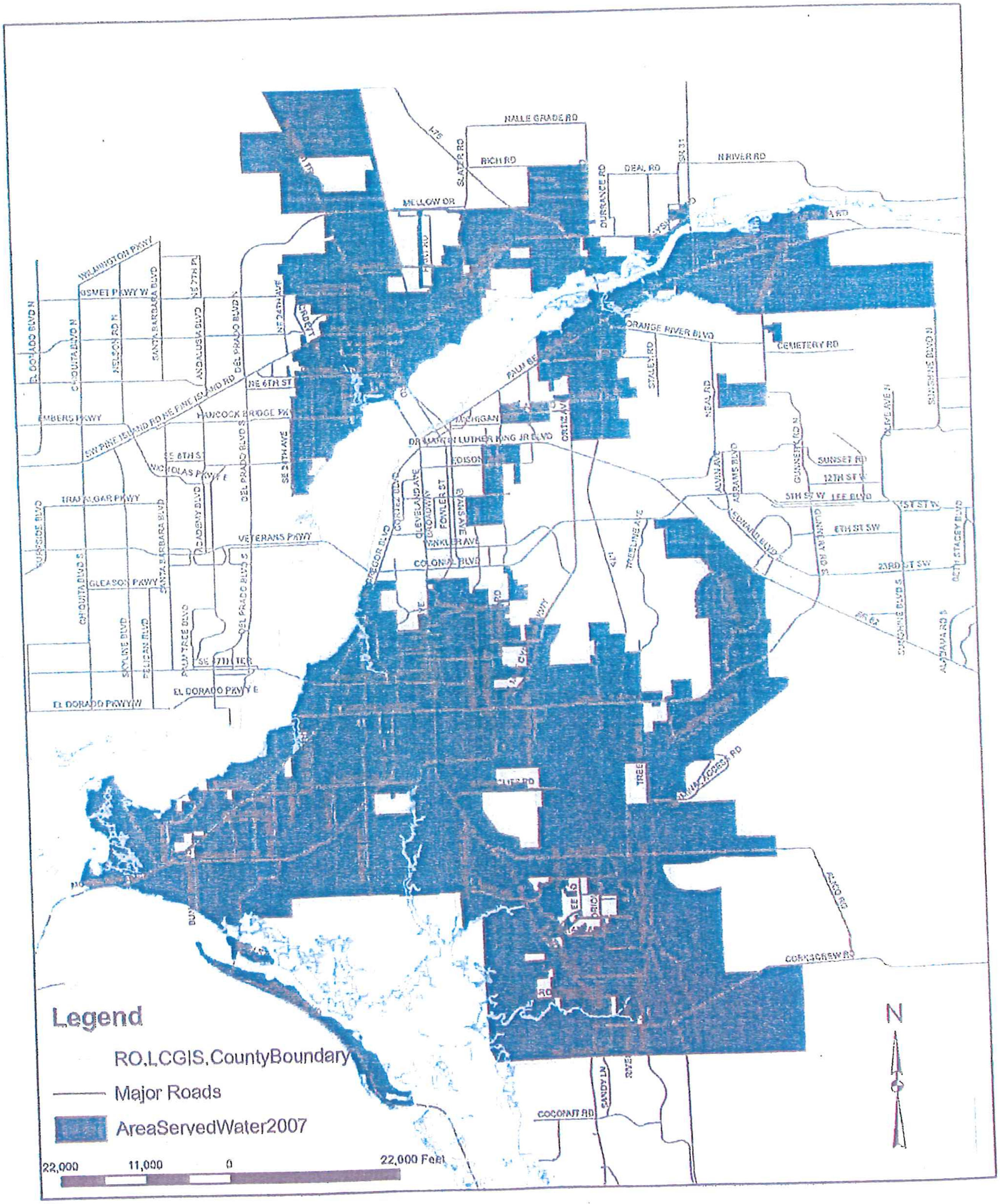


FIGURE 3

Lee County Utilities
Future Service Area

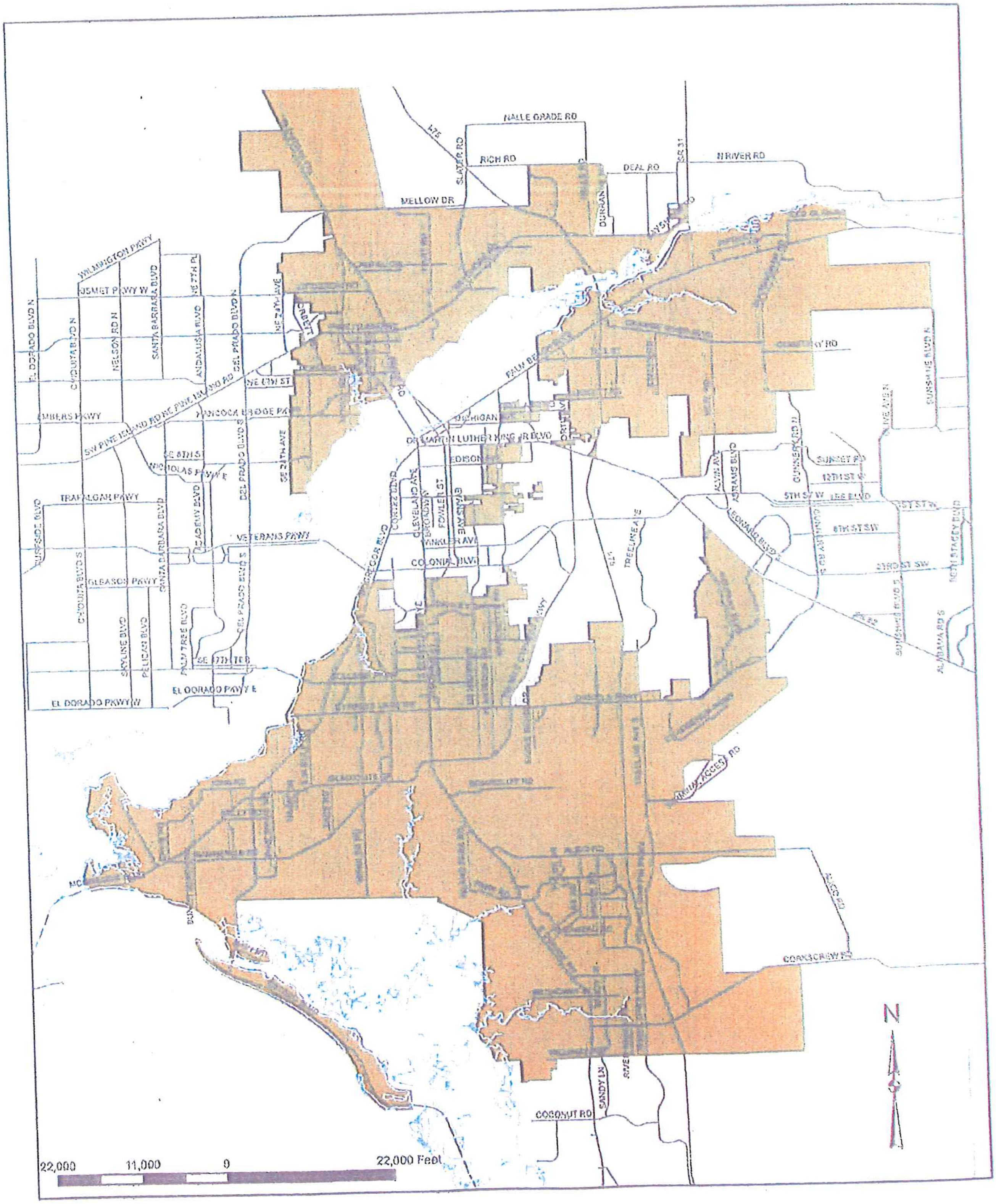
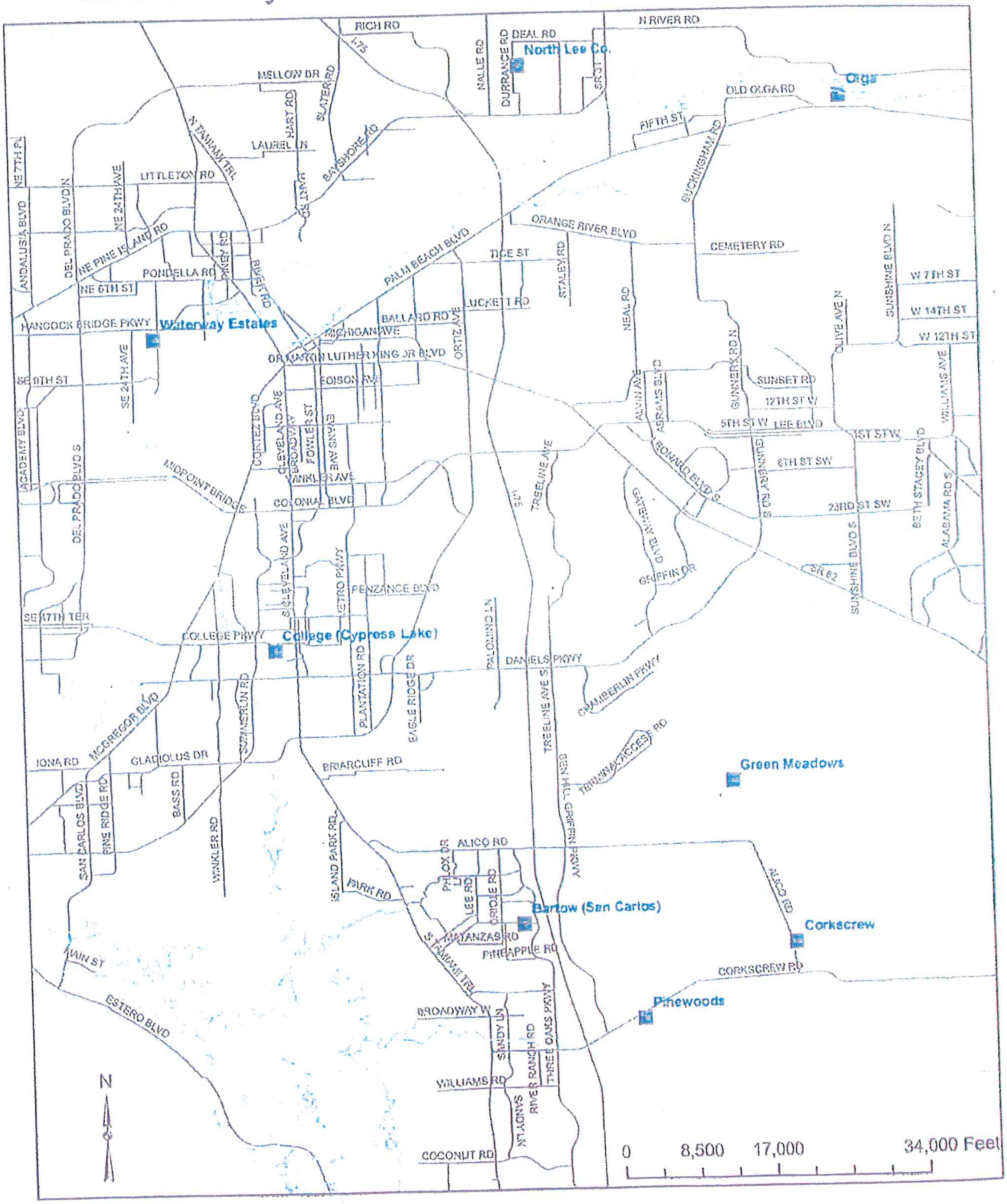


FIGURE 4
Lee County Utilities Water Treatment Facilities



Corkscrew Wellfield

FIGURE 5

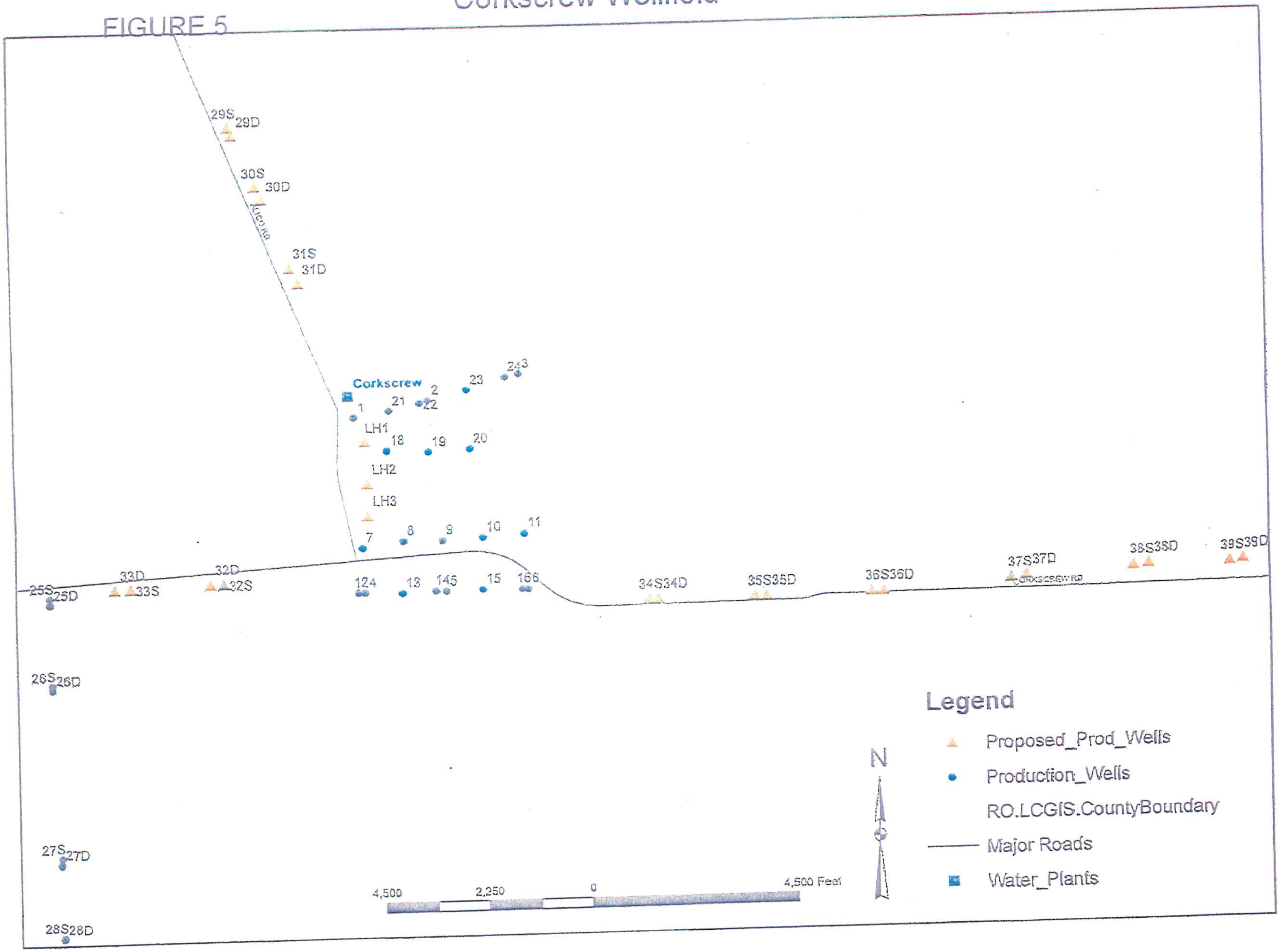
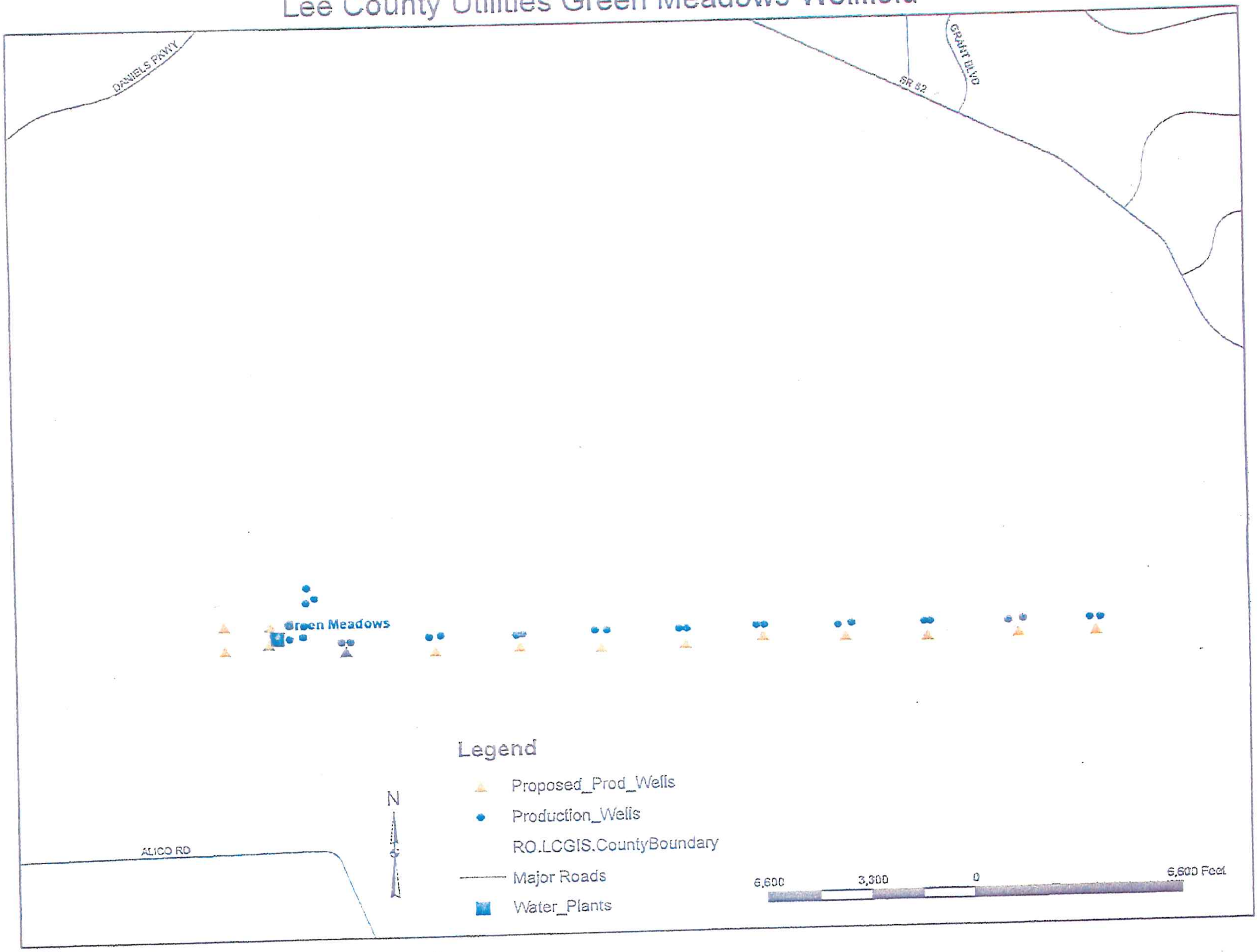


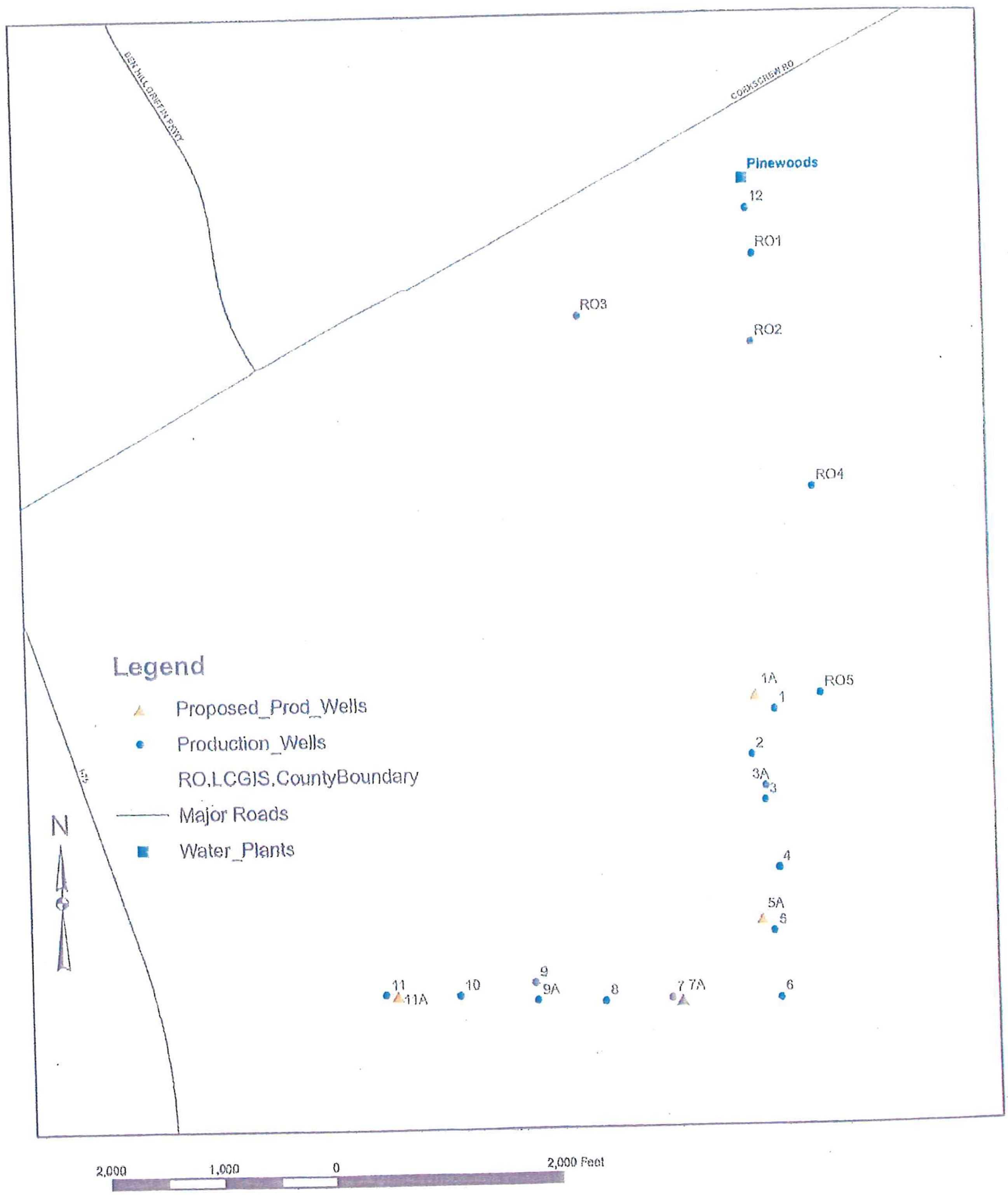
FIGURE 6

Lee County Utilities Green Meadows Wellfield



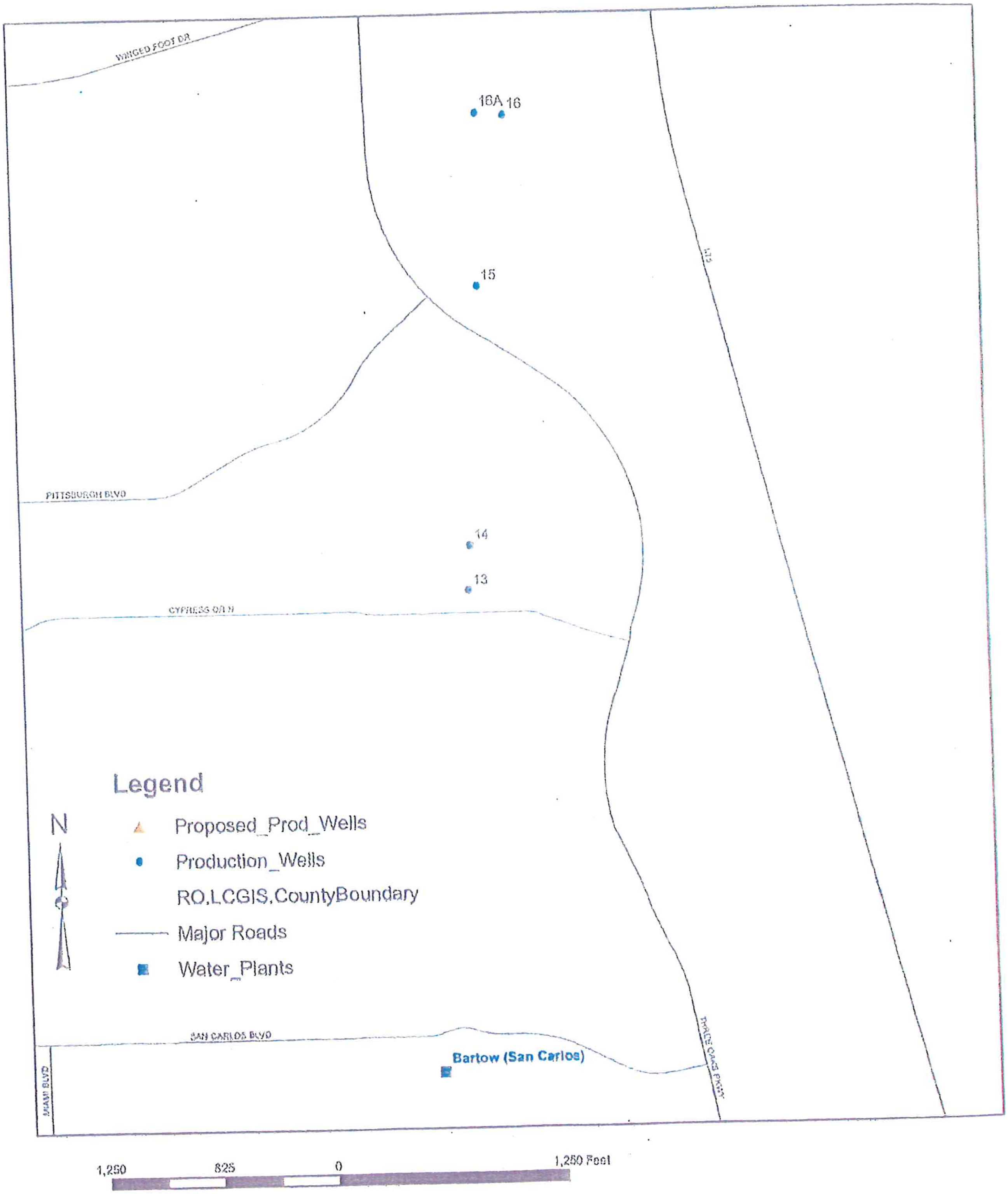
Pinewoods Wellfield

FIGURE 7



San Carlos / Bartow Wellfield

FIGURE 8



Waterway Estates Wellfield

FIGURE 10

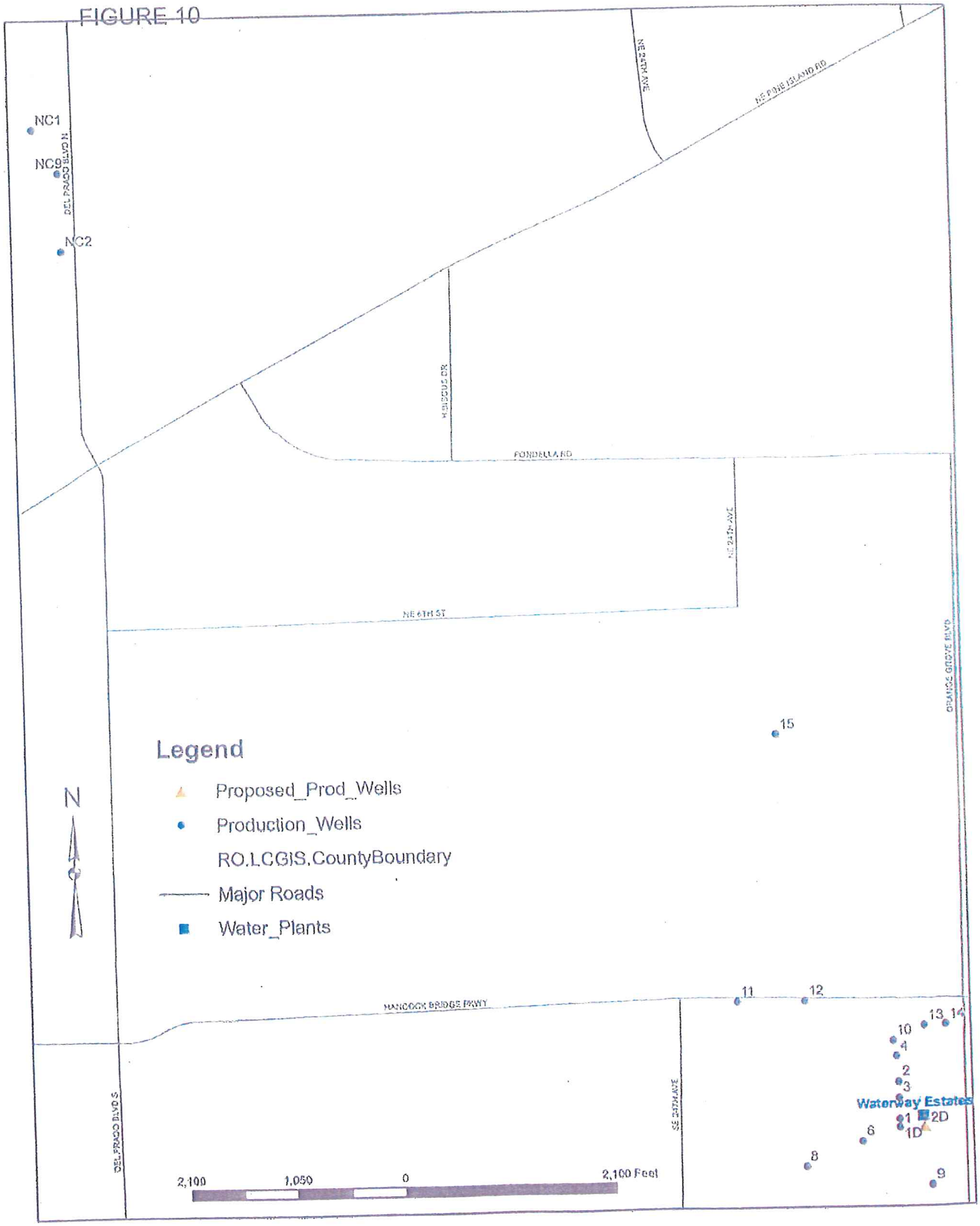


FIGURE 11
North Lee County Existing and Proposed Wellls

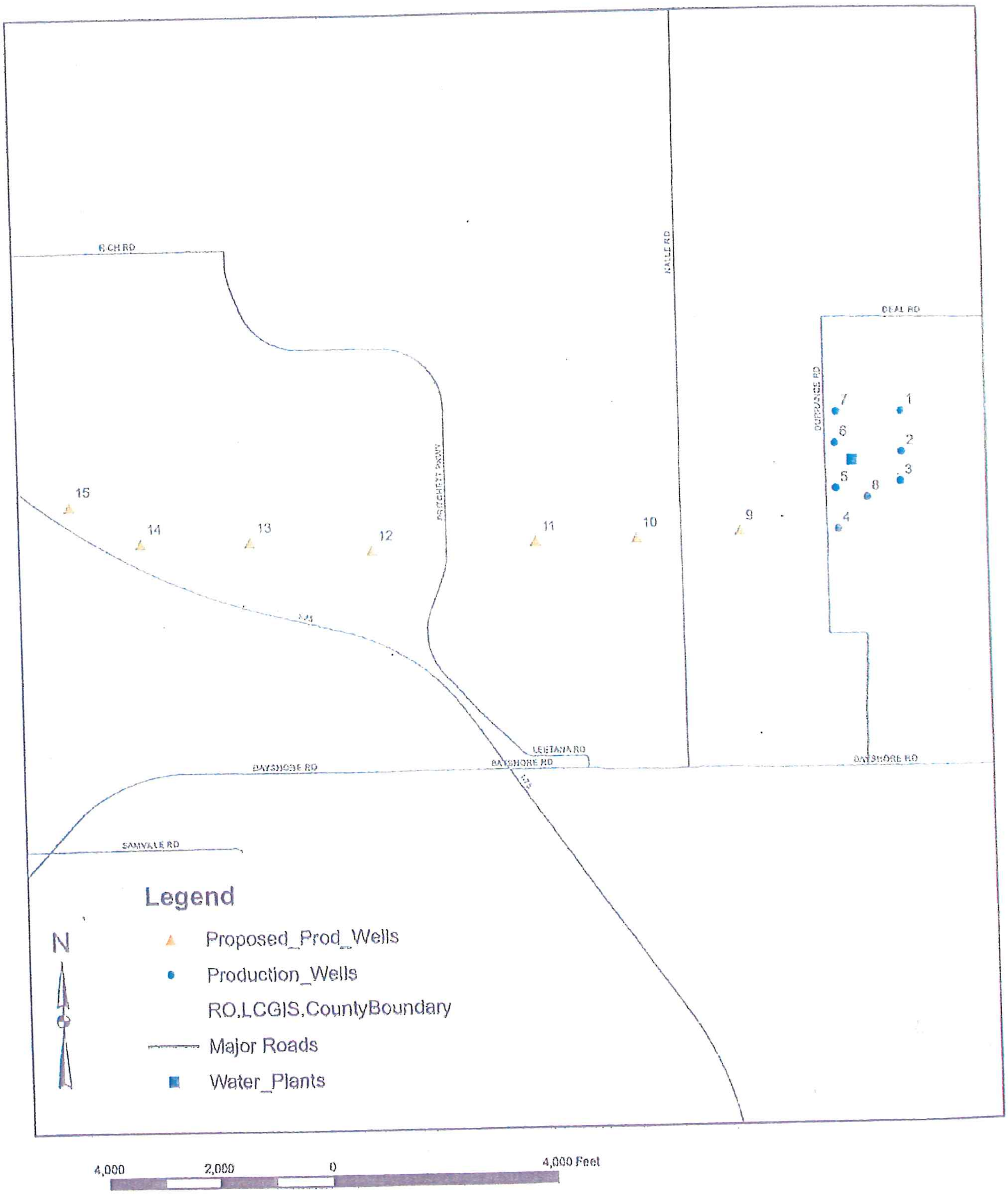


FIGURE 13
Lee County Utilities Storage Facilities

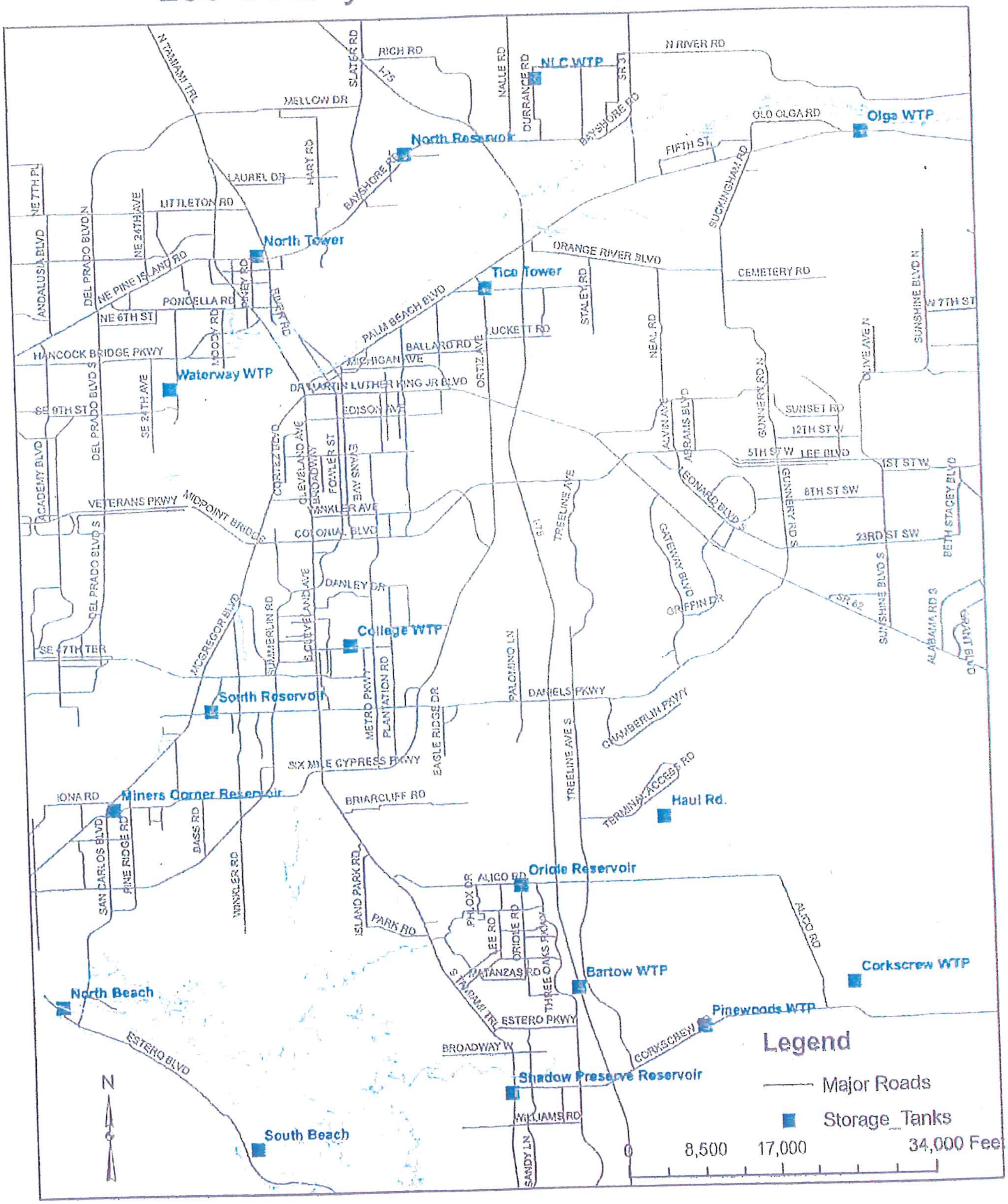


FIGURE 14
Lee County Utilities Corkscrew ASR Wells

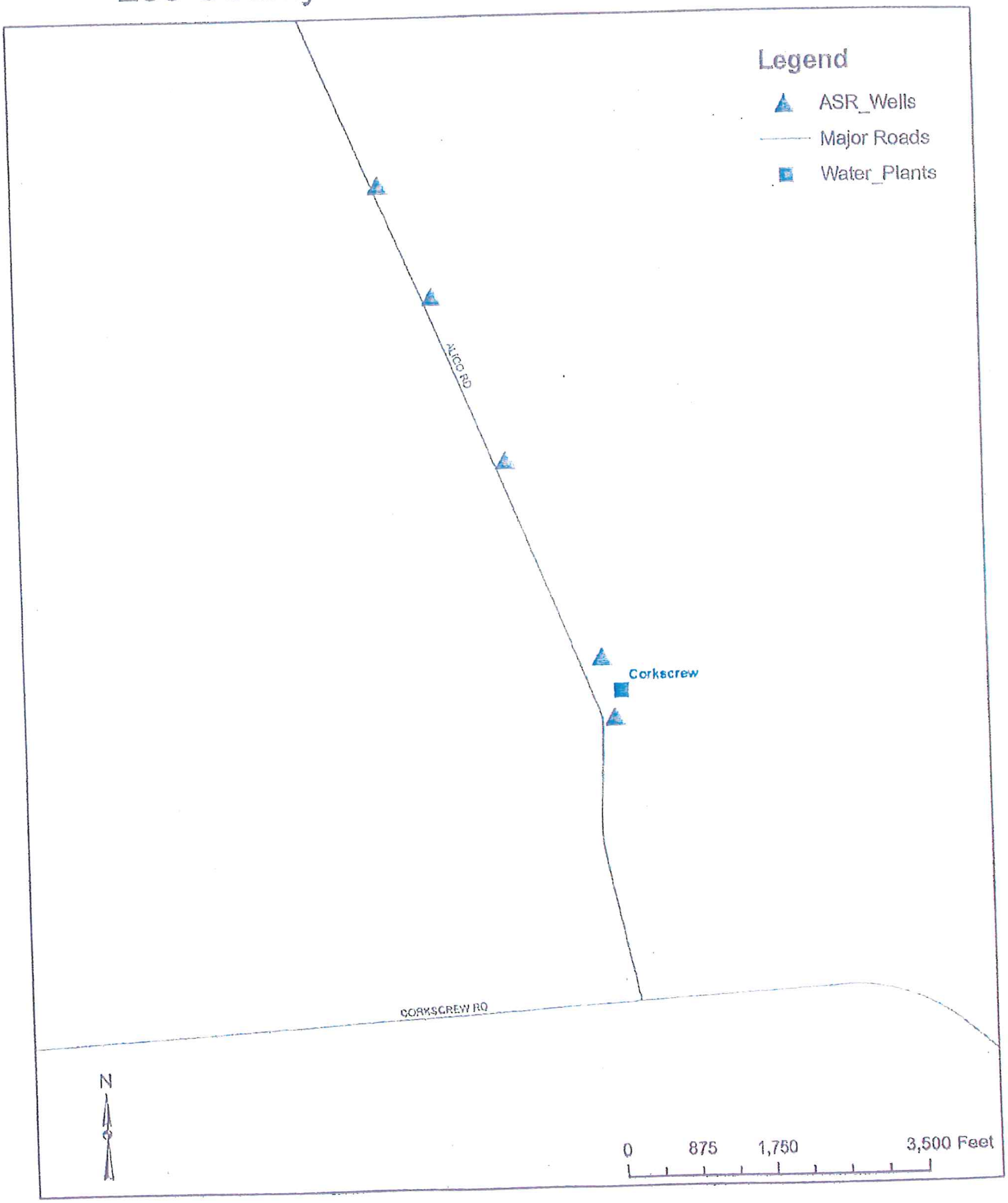
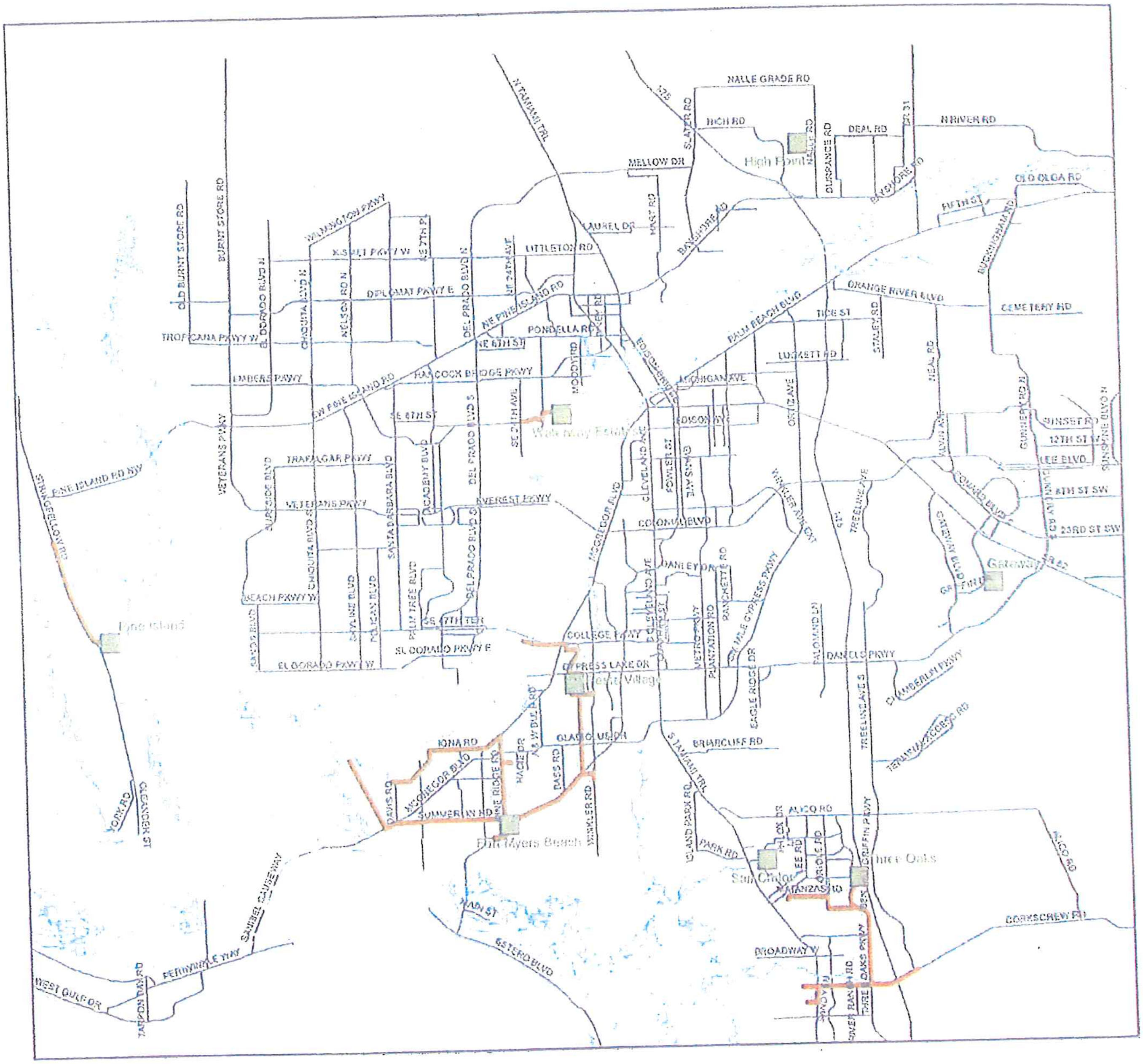


Figure 15
Wastewater Plants & Reuse Lines



Legend

WWTP

Reuse_Lines

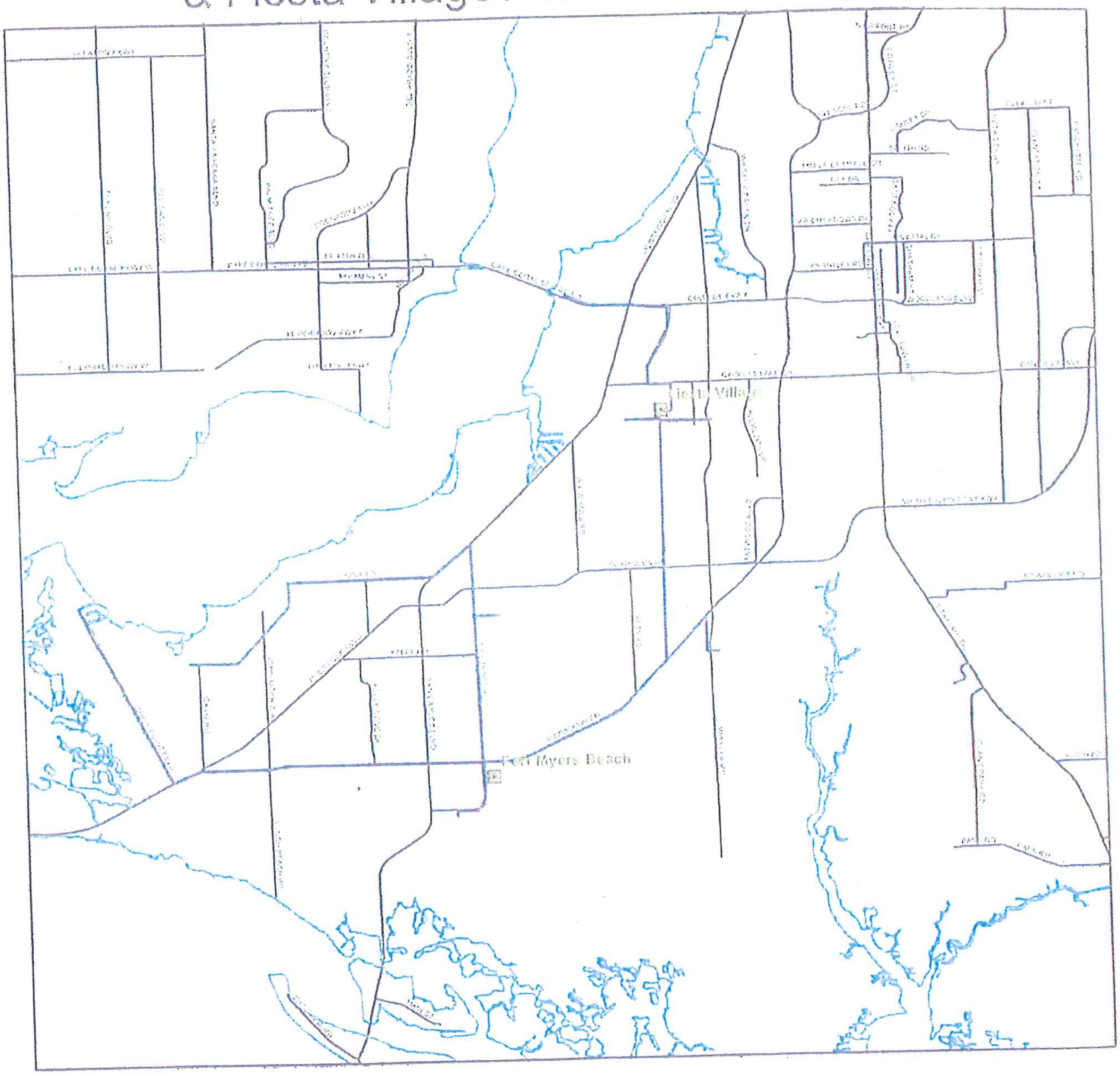
RO.LCGIS.CountyBoundary

Major Roads

N

21,000 10,500 0 21,000 Feet

Figure 16
Fort Myers Beach WWTP
& Fiesta VillageWWTP Reuse Lines



N
W E
S

Legend
—— sde.DOT.MajorRoads
---- sde.GIS.CountyBoundary
WWTP
—— Reuse_Lines

FIGURE 17
Lee County Utilities Waterway Estates Reuse

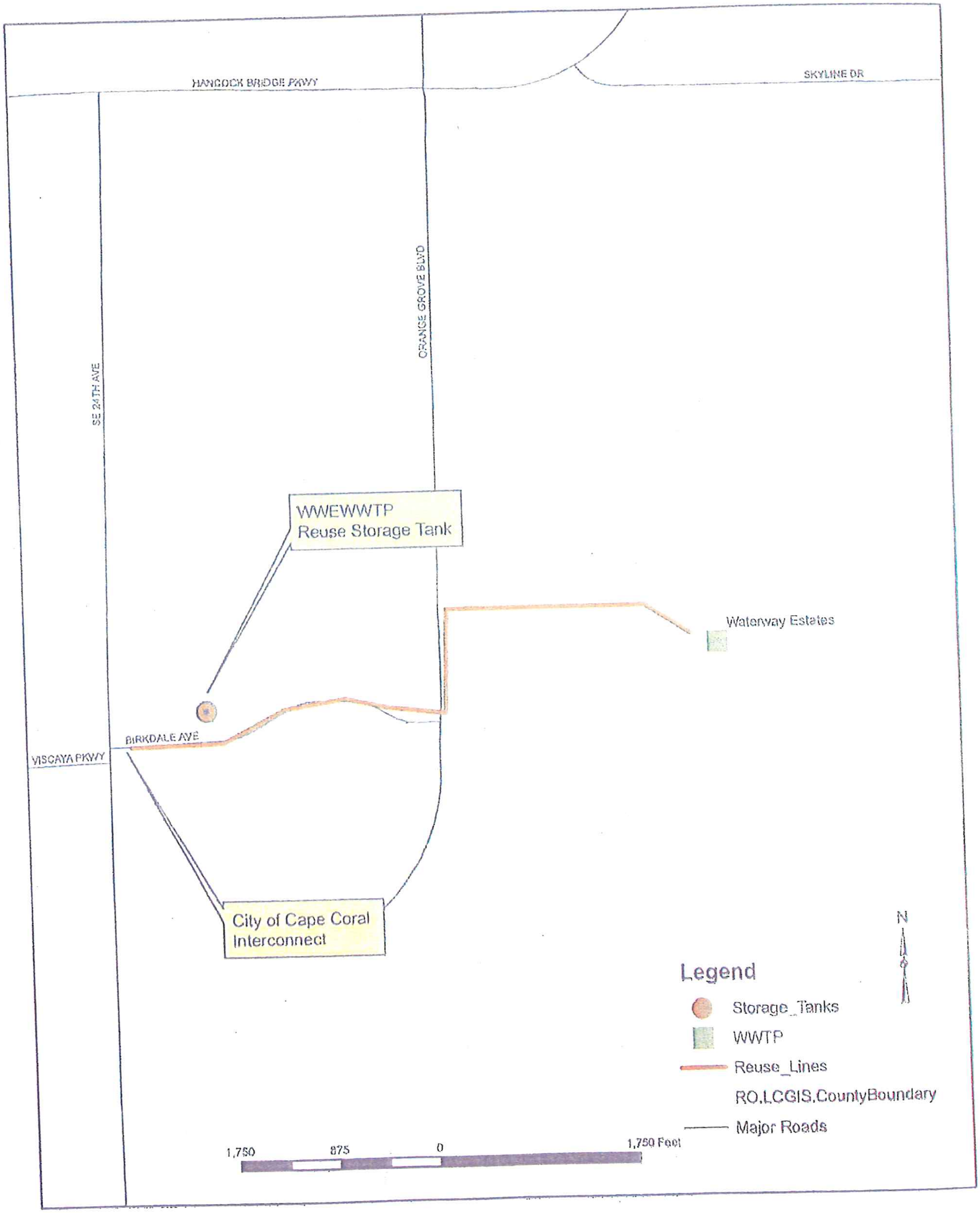


Figure 18
Three Oaks WWTP
& San Carlos WWTP Reuse Lines

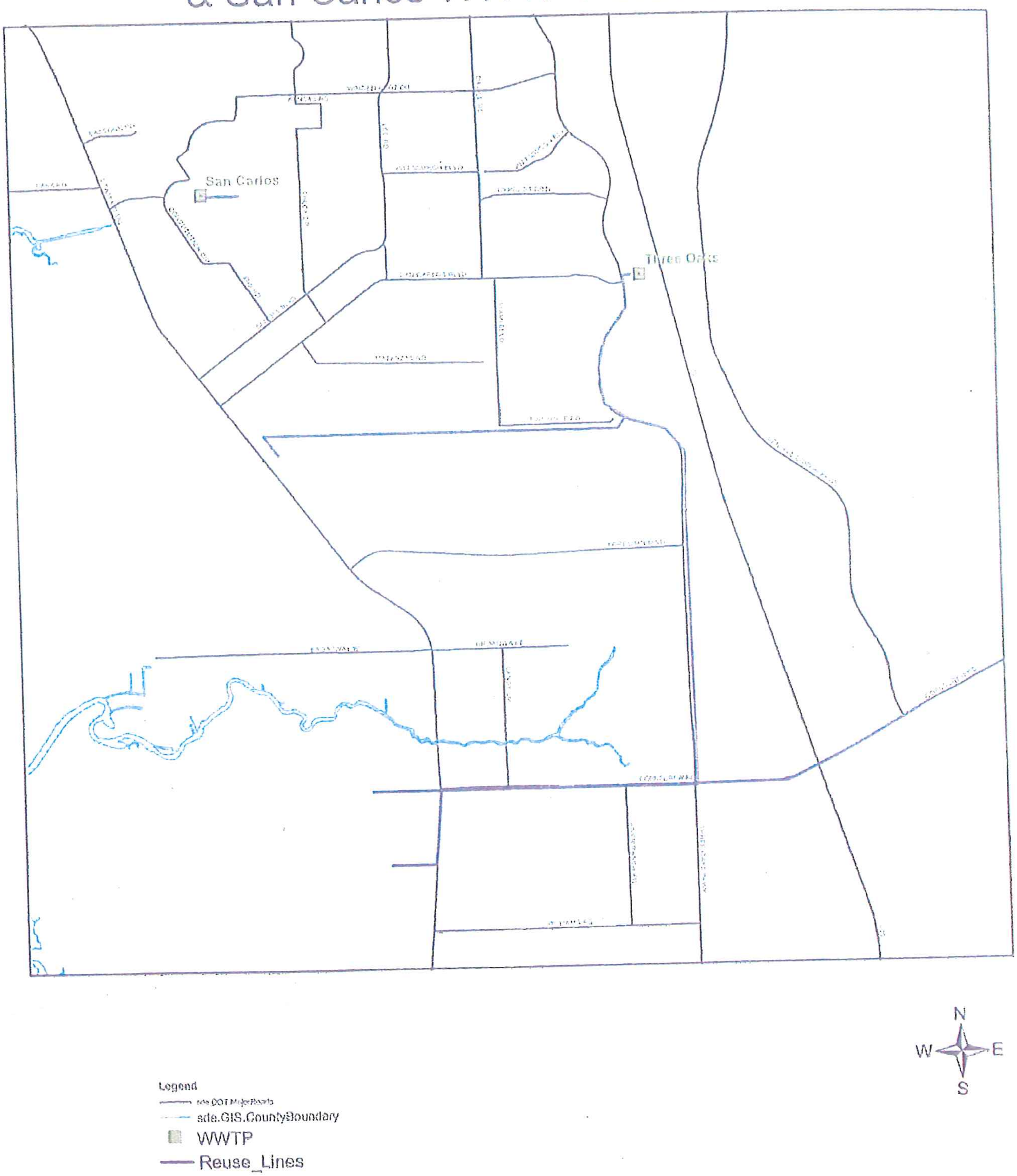


TABLE 2

Potable Water Storage Facilities

Name	Existing / Proposed	Type	Material	Capacity Million Gallons
North Tower	E	Elevated Tank	Steel	0.2
North Reservoir	E	Ground Storage	Concrete	2.0
South Reservoir	E	Ground Storage	Concrete	2.0
Tice Tower	E	Elevated Tank	Steel	0.3
Miners Corner Reservoir	E	Ground Storage	Concrete	2.0
Alico Reservoir	E	Ground Storage	Concrete	1.0
41 Reservoir	E	Ground Storage	Steel	1.0
Airport Haul Road	E	Ground Storage	Concrete	10.0
North Lee County WTP	E	Ground Storage	Concrete	5.0
Olga WTP	E	Ground Storage	Concrete	1.0
Corkscrew WTP	E	Ground Storage	Concrete	2.0
South Beach Tank	E	Ground Storage	Concrete	1.0
North Beach Tank	E	Ground Storage	Concrete	0.5
Waterway Estates WTP	E	Ground Storage	Concrete	1.0
College Pkwy WTP	E	Ground Storage	Concrete	1.5
Pinewoods WTP	E	Ground Storage	Concrete	2.0
Bartow WTP	E	Ground Storage	Concrete	0.5
Total System Storage				**33.0**

TABLE 3
CORKSCREW WELLFIELD
DESCRIPTION OF WELLS
EXISTING WELLS

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Capacity	Active	Year Drilled
1	E	12	243	132	open hole	500	Yes	2007
2	E	12	305	209	open hole	500	Yes	2004
3	E	12	305	209	open hole	500	Yes	2004
4	E	12	305	209	open hole	500	Yes	2004
5	E	12	305	209	open hole	500	Yes	2004
6	E	12	305	209	open hole	500	Yes	2004
7	E	12	135	45	45-130	500	Yes	1980
8	E	12	145	60	60-140	500	Yes	1980
9	E	12	145	55	55-140	500	Yes	1980
10	E	12	156	80	80-150	500	Yes	1980
11	E	12	155	55	55-145	500	Yes	1980
12	E	12	145	50	50-140	500	Yes	1980
13	E	12	140	50	50-135	500	Yes	1980
14	E	12	150	50	50-145	500	Yes	1980
15	E	12	150	58	58-145	500	Yes	1980
16	E	12	155	78	78-149	500	Yes	1980
18	E	12	115	45	45-105	500	Yes	1980
19	E	12	120	50	50-110	500	Yes	1980
20	E	12	120	50	50-110	500	Yes	1980
21	E	12	105	35	35-95	500	Yes	1980
22	E	12	110	40	40-100	500	Yes	1980
23	E	12	115	45	45-105	500	Yes	1980
24	E	12	120	50	50-110	500	Yes	1982
25S	E	12	80	30	30-60	500	Yes	1998
26S	E	12	80	30	30-70	500	Yes	1998
27S	E	12	80	30	30-70	500	Yes	1998
28S	E	12	85	30	30-75	500	Yes	1998
25D	E	12	180	115	115-170	350	Yes	1998
26D	E	12	170	120	120-160	350	Yes	1998
27D	E	12	170	120	120-160	350	Yes	1998
28D	E	12	185	125	125-175	350	Yes	1998

PROPOSED WELLS

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Capacity	Active	Year Drilled
29S	P	12	130	40	N/A	400	No	2008
29D	P	12	250	150	N/A	500	No	2008
30S	P	12	130	40	N/A	400	No	2008
30D	P	12	250	150	N/A	500	No	2008
31S	P	12	130	40	N/A	400	No	2008
31D	P	12	250	150	N/A	500	No	2008
32S	E	12	89	40	N/A	400	No	2008
32D	E	12	292	79	N/A	500	No	2008
33S	E	12	79	40	N/A	400	No	2008
33D	E	12	238	130	N/A	500	No	2008
34S	P	12	130	40	N/A	400	No	2008
34D	P	12	300	215	N/A	500	No	2008
35S	P	12	130	40	N/A	400	No	2008
35D	P	12	295	210	N/A	500	No	2008
36S	P	12	130	40	N/A	400	No	2008
36D	P	12	290	190	N/A	500	No	2008
37S	P	12	130	40	N/A	400	No	2008
37D	E	12	217	183	N/A	500	No	2008
38S	P	12	130	40	N/A	400	No	2008
38D	P	12	286	185	N/A	500	No	2008
39S	P	12	130	40	N/A	400	No	2008
39D	P	12	280	180	N/A	500	No	2008
40	P	12	820	700	N/A	1000	No	2008
41	E	12	810	690	open hole	1000	No	2008

TABLE 4
GREEN MEADOWS WELLFIELD
DESCRIPTION OF WELLS

EXISTING WELLS

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Intake Depth	Capacity	Active	Year Drilled	Meter Type
1	E	16	180	95	N/A	N/A	500	Yes	1974	Flow Meter
1D	E	10	38	20	N/A	N/A	500	Yes	1983	Flow Meter
2	E	16	182	99	N/A	N/A	500	Yes	1974	Flow Meter
2A	E	10	36	20	N/A	N/A	500	Yes	1983	Flow Meter
3	E	16	105	100	N/A	N/A	500	Yes	1975	Flow Meter
3A	E	10	42	23	N/A	N/A	500	Yes	1983	Flow Meter
3B	E	10	42	23	N/A	N/A	500	Yes	1983	Flow Meter
4	E	16	185	104	N/A	N/A	500	Yes	1978	Flow Meter
4A	E	10	43	20	N/A	N/A	500	Yes	1983	Flow Meter
5	E	16	185	104	N/A	N/A	500	Yes	1977	Flow Meter
5A	E	10	24	20	N/A	N/A	200	Yes	1991	Flow Meter
6	E	16	235	90	N/A	N/A	500	Yes	1981	Flow Meter
6A	E	10	40	18	N/A	N/A	200	Yes	1991	Flow Meter
7	E	16	235	90	145	N/A	500	Yes	1981	Flow Meter
7A	E	10	36	18	N/A	N/A	200	Yes	1990	Flow Meter
8	E	16	235	91	N/A	N/A	500	Yes	1989	Flow Meter
8A	E	10	42	20	N/A	N/A	500	Yes	1989	Flow Meter
9	E	16	120	91	N/A	N/A	500	Yes	1981	Flow Meter
9A	E	10	42	20	N/A	N/A	500	Yes	1983	Flow Meter
10	E	16	200	97	N/A	N/A	500	Yes	1989	Flow Meter
10A	E	10	42	18	N/A	N/A	200	Yes	1989	Flow Meter
11	E	10	185	115	N/A	N/A	500	Yes	1989	Flow Meter
11A	E	10	60	23	N/A	N/A	200	Yes	1989	Flow Meter
12	E	10	212	142	N/A	N/A	500	Yes	1990	Flow Meter
12A	E	10	40	21	N/A	N/A	200	Yes	1990	Flow Meter
13	E	10	210	140	N/A	N/A	500	Yes	1990	Flow Meter
13A	E	10	40	20	N/A	N/A	200	Yes	1990	Flow Meter

PROPOSEO WELLS IN EXISTING PERMIT

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Intake Depth	Capacity	Active	Proposed Year Drilled	Meter Type
15	P	12	200	100	N/A	N/A	500	No	N/A	N/A
15A	P	12	50	20	N/A	N/A	200	No	N/A	N/A
16	P	12	200	100	N/A	N/A	500	No	N/A	N/A
16A	P	12	50	20	N/A	N/A	200	No	N/A	N/A
17	P	12	200	100	N/A	N/A	500	No	N/A	N/A
17A	P	12	50	20	N/A	N/A	200	No	N/A	N/A
18	P	12	200	100	N/A	N/A	500	No	N/A	N/A
18A	P	12	50	20	N/A	N/A	200	No	N/A	N/A
19	P	12	200	100	N/A	N/A	500	No	N/A	N/A
19A	P	12	50	20	N/A	N/A	200	No	N/A	N/A
20	P	12	200	100	N/A	N/A	500	No	N/A	N/A
20A	P	12	50	20	N/A	N/A	200	No	N/A	N/A
21	P	12	200	100	N/A	N/A	500	No	N/A	N/A
21A	P	12	50	20	N/A	N/A	200	No	N/A	N/A
22	P	12	200	100	N/A	N/A	500	No	N/A	N/A
22A	P	12	50	20	N/A	N/A	200	No	N/A	N/A
23	P	12	200	100	N/A	N/A	500	No	N/A	N/A
23A	P	12	50	20	N/A	N/A	200	No	N/A	N/A
24	P	12	800	500	N/A	N/A	600	No	N/A	N/A
25	P	12	800	500	N/A	N/A	600	No	N/A	N/A
26	P	12	800	500	N/A	N/A	600	No	N/A	N/A

PROPOSED WELLS IN PROPOSED PERMIT

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Intake Depth	Capacity	Active	Proposed Year Drilled	Meter Type
1F	P	14	850	650	N/A	100	700	No	2008	Flow Meter
2F	P	14	850	650	N/A	100	700	No	2008	Flow Meter
3F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
4F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
5F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
6F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
7F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
8F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
9F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
10F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
11F	P	14	850	850	N/A	100	700	No	2009	Flow Meter
12F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
13F	P	14	850	650	N/A	100	700	No	2009	Flow Meter
15F	P	14	850	650	N/A	100	700	No	2009	Flow Meter

TABLE 5
PINEWOODS WELLFIELD
DESCRIPTION OF WELLS

EXISTING WELLS

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Intake Depth	Capacity	Active	Year Drilled	Meter Type
1	E	16	31	16	N/A	N/A	450	Yes	1988	Flow Meter
2	E	16	40	19	N/A	N/A	450	Yes	1988	Flow Meter
3	E	16	40	19	N/A	N/A	450	Yes	1988	Flow Meter
4	E	16	39	19	N/A	N/A	450	Yes	1988	Flow Meter
5	E	16	42	20	N/A	N/A	450	Yes	1988	Flow Meter
6	E	16	32	22	N/A	N/A	450	Yes	1988	Flow Meter
7	E	16	39	19	N/A	N/A	450	Yes	1988	Flow Meter
8	E	16	30	20	N/A	N/A	450	Yes	1988	Flow Meter
9	E	16	30	21	N/A	N/A	450	Yes	1988	Flow Meter
10	E	16	30	18	N/A	N/A	450	Yes	1988	Flow Meter
11	E	16	30	17	N/A	N/A	450	Yes	1990	Flow Meter
12	E	6	123	83	N/A	N/A	75	Yes	2001	Flow Meter
9A	E	8	171	85	85-125	N/A	75	Yes	2002	Flow Meter
3A	E	8	138	85	N/A	N/A	75	Yes	2003	Flow Meter
RO-1	E	14	651	603	N/A	N/A	700	Yes	2007	Flow Meter
RO-2	E	14	700	550	N/A	N/A	700	Yes	2007	Flow Meter
RO-3	E	14	700	550	N/A	N/A	700	Yes	2007	Flow Meter
RO-4	E	14	700	550	N/A	N/A	700	Yes	2007	Flow Meter
RO-5	E	14	700	550	N/A	N/A	700	Yes	2007	Flow Meter

PROPOSED WELLS

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Intake Depth	Capacity	Active	Year Drilled	Meter Type
1A	P	8	200	85	N/A	N/A	75	No	N/A	N/A
5A	P	8	200	85	85-125	N/A	75	No	N/A	N/A
7A	P	8	200	85	85-125	N/A	75	No	N/A	N/A
11A	P	8	200	85	85-125	N/A	75	No	N/A	N/A

SAN CARLOS WELLFIELD
DESCRIPTION OF WELLS

EXISTING WELLS

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Intake Depth	Capacity	Active	Year Drilled	Meter Type
13	E	8	41	19	N/A	N/A	500	Standby	1988	Flow Meter
14	E	8	45	22	N/A	N/A	500	Standby	1984	Flow Meter
15	E	8	40	18	N/A	N/A	500	Standby	1980	Flow Meter
16	E	8	40	19	N/A	N/A	N/A	No	1980	Flow Meter
16A	E	8	40	22	N/A	N/A	375	Standby	2000	Flow Meter

TABLE 7
WATERWAY ESTATES WELLFIELD
DESCRIPTION OF WELLS

EXISTING WELLS

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Capacity	Active	Year Drilled	Meter Type
1	E	8	48	30	40	Yes	1957	Flow Meter
2	E	8	57	42	75	Yes	1957	Flow Meter
3	E	8	130	130	30	Yes	1966	Flow Meter
4	E	8	48	14	50	Yes	1966	Flow Meter
6	E	8	205	124	45	Yes	1971	Flow Meter
8	E	8	43	13	40	Yes	1976	Flow Meter
9	E	8	230	125	50	Yes	1971	Flow Meter
10	E	8	235	134	30	Yes	1972	Flow Meter
11	E	10	230	130	85	Yes	1983	Flow Meter
12	E	10	60	40	60	Yes	1983	Flow Meter
13	E	10	80	50	30	Yes	1983	Flow Meter
14	E	10	230	136	85	Yes	1982	Flow Meter
15	E	8	208	160	65	Yes	1988	Flow Meter
NC-1	E	8	240	140	70	Yes	1970	Flow Meter
NC-2	E	8	240	140	85	Yes	1975	Flow Meter
NC-9	E	8	225	164	110	Yes	1975	Flow Meter
1D	E	4	600	300	100	Yes	1989	Flow Meter

PROPOSED WELLS

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Capacity	Active	Year Drilled	Meter Type
2D	P	12	600	300	N/A	No	N/A	N/A

TABLE 8
NORTH LEE COUNTY WELLFIELD
DESCRIPTION OF WELLS

EXISTING WELLS

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Intake Depth	Capacity	Active	Year Drilled	Meter Type
1	E	17	637	500	N/A	120	700	Yes	2003	Flowmeter
2	E	17	700	493	N/A	120	700	Yes	2003	Flowmeter
3	E	17	592	441	N/A	120	800	Yes	2003	Flowmeter
4	E	17	653	451	N/A	120	780	Yes	2003	Flowmeter
5	E	17	670	500	N/A	120	550	Yes	2003	Flowmeter
6	E	17	700	475	N/A	N/A	Plug&Aban	No	2003	Flowmeter
7	E	17	700	478	N/A	140	500	Yes	2002	Flowmeter
8	E	17	600	470	N/A	120	670	Yes	2003	Flowmeter

PROPOSED WELLS IN EXISTING PERMIT

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Intake Depth	Capacity	Active	Year Drilled	Meter Type
9	P	12	N/A	N/A	N/A	N/A	580	N/A	2008	N/A
10	P	12	N/A	N/A	N/A	N/A	580	N/A	2008	N/A
11	P	12	N/A	N/A	N/A	N/A	580	N/A	2008	N/A
12	P	12	N/A	N/A	N/A	N/A	580	N/A	2008	N/A

PROPOSED WELLS IN PROPOSED PERMIT

Well #	Existing / Proposed	Diameter	Total Depth	Cased Depth	Screen Interval	Intake Depth	Capacity	Active	Year Drilled	Meter Type
9	P	17	700	500	N/A	120	725	No	2008	Flowmeter
10	P	17	700	500	N/A	120	725	No	2008	Flowmeter
11	P	17	700	500	N/A	120	725	No	2008	Flowmeter
12	P	17	700	500	N/A	120	725	No	2008	Flowmeter
13	P	17	700	500	N/A	120	725	No	N/A	Flowmeter
14	P	17	700	500	N/A	120	725	No	N/A	Flowmeter
15	P	17	700	500	N/A	120	725	No	N/A	Flowmeter
16	P	17	700	500	N/A	120	725	No	N/A	Flowmeter
17	P	17	700	500	N/A	120	725	No	N/A	Flowmeter
18	P	17	700	500	N/A	120	725	No	N/A	Flowmeter

TABLE 9
OLGA WTP
SURFACE WATER PUMP DESCRIPTION

Pump #	Existing/ Proposed	Pump Manufacturer	Pump Type	Capacity(GPM)	Horsepower	Diameter	Elevation of Intake
1	E	Peerless	Verticle Turbine	3850	75	14	5.4
2	E	Peerless	Verticle Turbine	3000	40	14	5.4
3	E	Peerless	Verticle Turbine	3850	60	14	5.4
4	P	N/A	N/A	2900	50	16	5.4
5	P	N/A	N/A	2900	50	16	5.4

TABLE 10
ASR WELLS
DESCRIPTION OF WELLS

EXISTING

Well #	Facility	Existing / Proposed	Diameter	Total Depth	Cased Depth	Capacity	Active	Year Drilled	Meter Type
ASR#1	Corkscrew	E	12	397	328	450	Y	1995	Flowmeter
ASR#2	Corkscrew	E	12	397	337	450	Y	2000	Flowmeter
ASR#3	Corkscrew	E	12	347	285	450	Y	2000	Flowmeter
ASR#4	Corkscrew	E	12	368	310	450	Y	2000	Flowmeter
ASR#5	Corkscrew	E	12	291	253	450	Y	2000	Flowmeter
ASR#1	N. Res.	E	12	642	540	500	Y	1999	Flowmeter
ASR#1	Olga	E	16	920	859	500	Y	2000	Flowmeter
ASR#5	Olga	E	16	925	864	500	Y	2007	Flowmeter

PROPOSED

Well #	Facility	Existing / Proposed	Diameter	Total Depth	Cased Depth	Capacity	Active	Year Drilled	Meter Type
ASR#2	Olga	P	16	650	550	375	N	NA	N/A
ASR#3	Olga	P	16	650	550	375	N	NA	N/A
ASR#4	Olga	P	16	650	550	375	N	NA	N/A

TABLE 11
CAPITAL IMPROVEMENT PROJECTS
APPROVED LEE COUNTY CIP FY 08/09

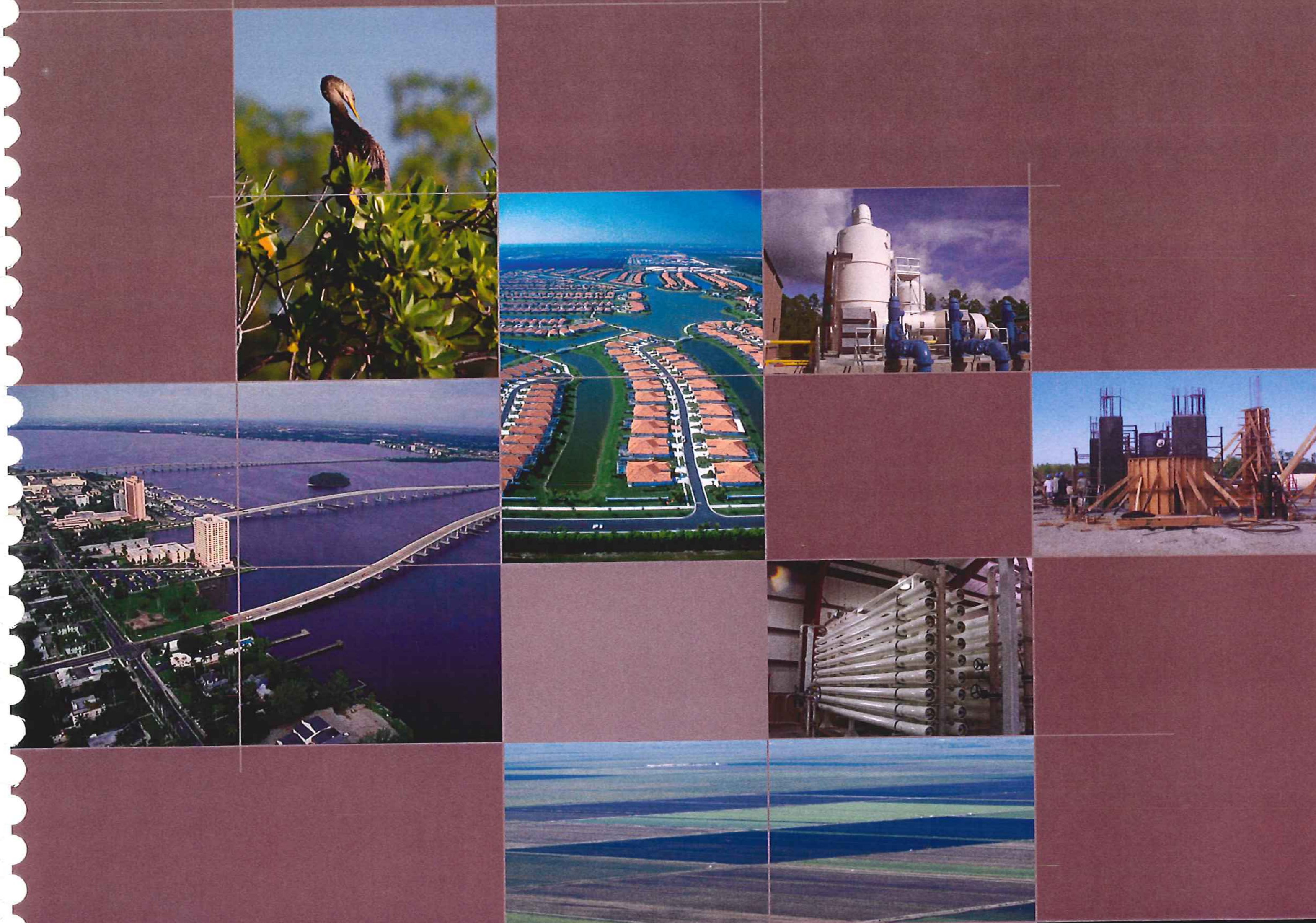
WATER SUPPLY DEVELOPMENT PROJECTS

CIP PROJECT #	LCU PROJECT NAME/ LWCWSP PROJECT NAME	DESCRIPTION	PROJECT STATUS	TOTAL PROJECT COST	ESTIMATED COMPLETION DATE	FUNDING SOURCE
7602	North Lee County R.O. Plant Wellfield Expansion / North Lee County Lower Hawthorn Wellfiled and Plant Expansion	Expansion of the Lower Hawthorn wellfield at the NLC WTP from 5.0 MGD to 10.0 MGD finished water	Design and land acquision underway	$15,390,000.00	2010	Enterprise Fund
7028	North Lee County WTP Expansion to 10 MGD / North Lee County Lower Hawthorn Wellfiled and Plant Expansion	Expansion of the NLC WTP from 5.0 MGD to produce 10.0 MGD finish water	Preliminary Design Underway	$15,000,000.00	2011	Enterprise Fund
None	Corkscrew WTP Expansion to 20 MGD / Not in LWCWSP	Expand the treatment capcity of the Corkscrew WTP to 20.0 MGD	Planning	$13,501,000.00	2015-2020	Debt Finance
None	Corkscrew WTP Wellfield Improvements / Not in LWCWSP	Expand the capacity of the Corkscrew Wellfield to provide a total of 20.0 MGD	Planning	$9,750,000.00	2015-2020	Debt Finance
None	Desalination Plant Transmission Mains / Not in LWCWSP	Construct finish water transmission mains to accomidate a Desalination Plant	Planning	$18,195,500.00	2015-2020	Enterprise Fund
None	Feasibilty Analysis / Design / Desalination Plant / Not in LWCWSP	Perform a feasibility analysis, design, and construct a desalination water plant	Planning	$70,000,000.00	2015-2020	Enterprise Fund

ALTERNATIVE WATER RESOURCE PROJECTS

None	Gateway WWTP ASR System / Not in LWCWSP	Develop an ASR system to provide seasonal storage of reclaimed water to serve the Gateway WWTP	Planning	$3,200,000.00	2012	Enterprise Fund
7284	Reclaimed Water ASR / Health Park Reclaimed Water ASR	Pilot and Construction of reclaimed water ASR for Wasteater Treatment Facilities	Planning	$600,000.00	2012	Enterprise Fund
7300	Reuse Valves Control, SCADA project	Construct Automated controls for reclaimed water sites	Underway	$100,000.00	2009	Enterprise Fund
None	Ben Hill Griffin Parallel Forcemain / FGCU/Miromar Lakes Reclaimed Water Main	Construct 900 L.F. of 12" reclaimed water line from 3 Oaks WWTP to FGCU / Combined with Parallel Force Main Project	Design underway	$6,000,000.00 for total project $100,000.00 for reclaimed water line portion	2011	Grant/Enterprise Fund

SOUTH FLORIDA WATER MANAGEMENT DISTRICT



LOWER WEST COAST
Water Supply Plan

2005-2006 UPDATE

sfwmd.gov

Acknowledgements

The South Florida Water Management District (SFWMD or District) would like to recognize and thank the Water Resources Advisory Commission (WRAC) Regional Water Supply Workshop participants for their contributions, comments, advice, information and assistance throughout the development of this *2005–2006 Lower West Coast Water Supply Plan Update.*

Furthermore, the SFWMD expresses appreciation to all District staff who contributed to the development and production of this plan update.

For further information on this document, please contact:

Jim Jackson
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406
Telephone: (561) 682-6334
Email: jjackson@sfwmd.gov

sfwmd.gov

Executive Summary

The South Florida Water Management District's (SFWMD or District) strategic goal for all of its water supply planning efforts is to ensure an adequate supply of water to protect natural systems and to meet all existing and projected reasonable-beneficial uses, while sustaining water resources for future generations.

This *2005–2006 Lower West Coast Water Supply Plan Update* (2005–2006 LWC Plan Update) supports the District's findings and recommendations in its *2000 Lower West Coast Water Supply Plan* (2000 LWC Plan), which suggest that most future water needs must be met through development of alternative water sources. Development of new traditional freshwater sources will limited by environmental protections, but some new freshwater development may still be practicable depending on local conditions and quantities needed. Considering the viability and availability of alternative supplies, and the constraints on development of traditional freshwater supplies, the focus of the 2005–2006 LWC Plan Update is on alternative water sources and projects.

The Lower West Coast (LWC) Planning Area has long been a leader in alternative water supply development. Alternative water sources include reclaimed water, surface water captured during wet-weather flows, aquifer storage and recovery, surface reservoirs, and brackish surface water and groundwater. Currently, brackish water sources provide about 40 percent of the area's public potable water supply, and reclaimed water use stands at over 90 percent of the wastewater flow for the area.

As part of the 2005–2006 LWC Plan Update development, the District solicited projects from local suppliers and a total of 153 water supply projects were evaluated. Fourteen traditional supply projects were evaluated, including 11 submitted by local utilities and three projects developed by the District to support an unmet future need by small local utilities. In total, if all of these traditional supply projects were permittable and developed as proposed, they represent about 25 million gallons per day (MGD) in new supply capacity.

During this process, 117 alternative water supply projects were also evaluated. The alternative sources these projects propose to use include the following:

BRACKISH WATER / 41 projects yielding a potential 231 MGD (finished water).

RECLAIMED WATER / 55 projects with a total constructed capacity of 307 MGD.

AQUIFER STORAGE AND RECOVERY (ASR) / 13 projects with a total dry-season capacity of 32 MGD.

SURFACE WATER / 8 projects with a total design capacity of 42 MGD.

In addition to listing proposed alternative water supply projects, this plan update provides regional project implementation strategies to planners, policy makers and utility directors. All local governments within the LWC Planning Area are required to prepare 10-Year Water Supply Facilities Work Plans that identify water supply projects, and adopt revisions to their comprehensive plans within 18 months following the approval of this water supply plan update.

The Water Protection and Sustainability Program provides annual state revenues matched with District funds to support alternative water supply development. This combination of state and District funds is available each year through the District's Alternative Water Supply Funding Program for projects that are ready to be constructed. Eligible projects can receive up to 40 percent of the construction costs for work that can be completed within the funding period (October 1 through August 1). Funding proposals are solicited in the spring of each year.

To be eligible for cost-share funding, the specific alternative water supply projects must be identified in the appropriate water supply plan. While inclusion in this 2005–2006 LWC Plan Update enables projects planned for the LWC Planning Area to be eligible to apply for funding assistance from the District's Alternative Water Supply Funding Program, a project's inclusion in this plan does not serve as an application for funding, nor does it guarantee funding. To apply for alternative water supply funding or for more information, see the SFWMD's Web site at: http://www.sfwmd.gov/watersupply.

Encompassing more than 5,100 square miles, the LWC Planning Area generally reflects the drainage patterns of the Caloosahatchee River Basin and the Big Cypress Swamp. The LWC Planning Area includes all of Lee County, most of Collier and Hendry counties, and portions of Glades, Charlotte and mainland Monroe counties. The Big Cypress Basin, which comprises all of Collier County and part of Monroe County, is also located within the planning area.

The LWC Planning Area's population is expected to increase from 908,500 in 2005 to about 1.6 million by 2025 (U.S. Bureau of the Census 2001). Most of the growth is projected to occur in Collier and Lee counties where population increases of 67 percent and 91 percent, respectively, are projected. Urban water demand (municipal, domestic self-supply, recreational and commercial) in the planning area will increase by 113 MGD in association with the population increase. Water demand associated with new power generation facilities proposed for the planning area will increase by 67 MGD in the next 20 years. By 2025, agricultural acreage under cultivation in the LWC Planning Area is projected to increase by 13,400 acres, in part reflecting a shift in agricultural operations from Lee and Collier counties to Glades and Hendry counties, and requiring an additional 17 MGD in supply.

Traditional water sources for urban and agricultural use in the LWC Planning Area have included supplies from surface water, primarily the Caloosahatchee River (C-43 Canal), and three major aquifer systems: the Surficial Aquifer System, the Intermediate Aquifer System and the Floridan Aquifer System. The Surficial and Intermediate aquifer systems typically contain fresh water, while the Floridan Aquifer in the planning area contains brackish water.

Multiple factors, including water quality deterioration, interference with other existing users and protection of wetlands, continue to limit development of additional fresh groundwater supplies. New supplies from the Caloosahatchee River may be limited by efforts to protect Lake Okeechobee from high water levels and concerns for the integrity of the Herbert Hoover Dike. Alternatives to development of additional traditional freshwater sources to meet increased water needs include development of brackish groundwater in the Lower Hawthorn Aquifer; expansion of the reclaimed distribution and supply system; the capture of seasonally available surface water; and, improved storage opportunities for surface and reclaimed water.

The 2005–2006 LWC Plan Update is organized into seven chapters and nine appendices. The following briefly summarizes the focus of each chapter:

Chapter 1 – Introduction explains the purpose of the water supply plan document, provides an overview of the planning process, and summarizes the SFWMD's accomplishments since publication of the 2000 LWC Plan. New legislation as it relates to the responsibility of each of Florida's five water management districts, as well as the statutory requirements of local governments and water users, are also briefly reviewed.

Chapter 2 – Demand Estimates and Projections provides an updated overview of population and water use trends, by use category, for the LWC Planning Area through the Year 2025. Water use definitions, new calculation methods and estimation models are also discussed.

Chapter 3 – Resource Analysis identifies the region's water sources, summarizes the studies and analyses supporting this 2005–2006 LWC Plan Update, and discusses the tools in place that are used to protect water resources under state law.

Chapter 4 – Issues identifies resource issues in the LWC Planning Area, including limitations on development of new traditional freshwater supplies, coastal water quality issues associated with urbanization and storm water, and the need to develop additional storage opportunities to enable the capture and beneficial use of seasonally available water resources.

Chapter 5 – Evaluation of Water Source Options reviews traditional sources, alternative water sources and storage options suitable for future use and further supply development. Comparative costs for supply development are provided.

Chapter 6 – Water Resource Development Projects discusses the SFWMD's projects that support the Water Supply Development projects (in Chapter 7) for the LWC Planning Area and the District's other planning areas. Water Resource Development projects are generally the responsibility of a water management district, and are intended to assure the availability of an adequate supply of water.

Chapter 7 – Water Supply Development Projects summarizes the projects anticipated to meet the LWC Planning Area's water supply needs for the next 20 years. Local governments, government-owned and privately owned utilities, regional water supply authorities, multijurisdictional water supply entities, self-suppliers, and other water users are primarily responsible for Water Supply Development projects. The primary focus is on alternative water supply projects, which become eligible for state and District funding as a result of inclusion in this water supply plan update.

The continued high rate of population growth in the LWC Planning Area, through the Year 2025, will require the region's increased commitment to water conservation and alternative water supply development. Comparison of population projections with the projects listed in this plan update indicates that existing and proposed new supplies are adequate to meet the projected future needs. The SFWMD will maintain efforts to assess water resources, coordinate critical resource protection strategies and projects, and restore vital environmental systems throughout the LWC Planning Area and south Florida.

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Acronyms and Abbreviations

ADF	average daily flow
AFSIRS	Agricultural Field Scale Irrigation Requirements Simulation
ASR	aquifer storage and recovery
AWS	alternative water supply
BEBR	Bureau of Economic and Business Research
BMP	best management practice
BOR	Basis of Review
C&SF Project	Central and Southern Florida Flood Control Project
CERP	Comprehensive Everglades Restoration Plan
cfs	cubic feet per second
Ch.	Chapter (generally used to refer to a legal document)
CUP	consumptive use permitting
District	South Florida Water Management District
DSS	domestic self-supply
EAA	Everglades Agricultural Area
EAR	Evaluation and Appraisal Report
EDR	electrodialysis reversal
ERP	environmental resource permitting
ET	evapotranspiration
F.A.C.	Florida Administrative Code
FAS	Floridan Aquifer System
FDACS	Florida Department of Agriculture and Consumer Services
FDCA	Florida Department of Community Affairs
FDEP	Florida Department of Environmental Protection
FPL	Florida Power & Light
F.S.	Florida Statutes
FY	fiscal year
GIS	geographic information system
GPD or gpd	gallons per day

IAS	Intermediate Aquifer System
LEC	Lower East Coast
LEC Plan	Lower East Coast Water Supply Plan
LOER	Lake Okeechobee & Estuary Recovery
LOPP	Lake Okeechobee Protection Program
LOWP	Lake Okeechobee Watershed Project
LWC	Lower West Coast
LWC Plan	Lower West Coast Water Supply Plan
MDL	maximum developable limit
MFL	minimum flow and level
MGD or mgd	million gallons per day
mg/L	milligrams per liter
MGY or mgy	million gallons per year
MIL	mobile irrigation laboratory
MODFLOW	MODular 3-dimensional finite-difference groundwater FLOW model
NAVD	North American Vertical Datum
NRCS	Natural Resources Conservation Service
ppm	parts per million
ppt	parts per thousand
PWS	public water supply
RIDS	regional irrigation distribution system
RO	reverse osmosis
SAS	Surficial Aquifer System
SAV	Submerged Aquatic Vegetation
SFWMD	South Florida Water Management District
SFWMM	South Florida Water Management Model
STA	stormwater treatment area
SWFFS	Southwest Florida Feasibility Study
SWFWMD	Southwest Florida Water Management District
TAZ	traffic analysis zone
TDS	total dissolved solids
TMDL	total maximum daily load
U.S.	United States
USACE	United States Army Corps of Engineers

USDA	United States Department of Agriculture
USDA-NRCS	United States Department of Agriculture - Natural Resources Conservation Service
USGS	United States Geological Survey
WaterSIP	Water Savings Incentive Program
WCA	water conservation area
WPA	water preserve area
WRAC	Water Resources Advisory Commission
WWTP	wastewater treatment plant

1

Introduction

In the Lower West Coast (LWC) Planning Area, the population is projected to increase by 74 percent from Year 2005 to about 1.6 million by Year 2025. Traditional fresh groundwater and surface water supplies were shown more than a decade ago to be inadequate to meet much of the projected new demand for the region, and this has resulted in extensive development of alternative water sources. Meeting the updated water supply and demand projections for the current 20-year planning horizon will require a continued focus primarily on nontraditional water supply solutions. This *2005–2006 Lower West Coast Water Supply Plan Update* (2005–2006 LWC Plan Update) supports the *2000 Lower West Coast Water Supply Plan*'s (2000 LWC Plan) findings and recommendations, which call for development of alternative water sources to meet most of the region's new water supply needs.

Working closely with the South Florida Water Management District (SFWMD or District), local governments and water suppliers play a key role in identifying the water supply projects that have been or will be incorporated into their local comprehensive plans. This 2005–2006 LWC Plan Update describes and meets current statutory requirements, including a listing of proposed alternative water supply projects and regional project implementation strategies for planners, policy makers and utility directors.

PURPOSE

This 2005–2006 LWC Plan Update addresses the anticipated water supply needs of the LWC Planning Area for the next 20 years and how those needs will be met. Although some traditional supply development may be possible given appropriate local conditions, the majority of new water needs will be met through the development and funding of alternative water supplies. In addition, this 2005–2006 LWC Plan Update contains a list of alternative water supply projects for Fiscal Years 2006–2025. The alternative

> **NAVIGATE**
>
> The 2005-2006 LWC Plan Update consists of this Planning Document and Appendices. In addition, the accompanying CD contains electronic versions of this update package, as well as the *Consolidated Water Supply Plan Support Document*, supporting studies, documentation, data and the previous 2000 LWC Plan. This material is also available from the District's Water Supply Plan Web site: http://www.sfwmd.gov/watersupply.

water supply projects listed in this plan update are eligible for cost-sharing consideration through a separate annual funding process that is established by the SFWMD Governing Board consistent with statutory requirements.

Florida Water Law

> **LAW / CODE**
>
> Section 373.0361(1), Florida Statutes (F.S.) provides:
>
> The governing board of each water management district shall conduct water supply planning for any water supply planning region within the district identified in the appropriate district water supply plan under Section 373.036, where it determines that existing sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the planning period.

The legal authority and requirements for water supply planning are included in Chapters 373, 403 and 187 of the Florida Statutes. During the State of Florida's 2005 legislative session, lawmakers revised state water law and created the Water Protection and Sustainability Program. The alternative water supply portion of this program is intended to reduce competition between users and natural systems for available water by encouraging the development of alternative water supplies. Chapter 4 of the *Consolidated Water Supply Plan Support Document* (SFWMD 2005–2006) further describes the Water Protection and Sustainability Program.

The new statutory provision strengthens the link between regional water supply plans and the potable water provisions contained within each local government's comprehensive plan. This portion of the law is designed to ensure that adequate potable water facilities are constructed and concurrently available with new development. All local governments within the LWC Planning Area are required to prepare 10-Year Water Supply Facilities Work Plans that identify water supply projects, and adopt revisions to comprehensive plans within 18 months following the approval of this water supply plan update.

Strengthening the Link between Regional Water Supply Planning and Local Government Comprehensive Planning

The Water Protection and Sustainability Program provides annual state revenues and matching District funds to support alternative water supply development, such as construction of desalination, reclaimed water and new storage facilities. This combination of state and District funds is specifically for cost-sharing alternative water supply project construction costs. The program also adds permitting incentives for water providers selecting projects recommended by the water supply plans.

Regional Water Supply Plans

> DISTRICT
>
> **Role of the South Florida Water Management District**
>
> The South Florida Water Management District (SFWMD or District) performs water supply planning for each region within its jurisdiction. The District's mission is to manage and protect water resources of the region by balancing and improving water quality, flood control, natural systems and water supply. The agency serves local governments by supporting efforts to safeguard existing natural resources and meet future water demands.

The SFWMD prepares water supply plans for each of its four planning areas to effectively support planning initiatives and address local issues. The regional water supply plans encompass a minimum 20-year future planning horizon and are updated every five years. Each regional water supply plan update provides revised water demand estimates and projections; an evaluation of existing regional water resources; identification of water supply-related issues; a discussion of present water source options; water resource and water supply development components including funding strategies; and, recommendations for meeting projected demands for the region. In addition, the 2005–2006 LWC Plan Update includes a discussion of minimum flows and levels (MFLs) established within the planning area; MFL recovery and prevention strategies where appropriate; water reservations adopted by rule; technical data; and, support information.

PLAN GOAL AND OBJECTIVES

The SFWMD's strategic goal for all of its water supply planning efforts is to ensure an adequate supply of water to protect natural systems and to meet all existing and projected reasonable-beneficial uses, while sustaining water resources for future generations. Additionally, the goal of the 2005–2006 LWC Plan Update is to identify sufficient sources of water to meet the needs of all reasonable-beneficial uses within the LWC Planning Area (**Figure 1**) for the Year 2025 during a 1-in-10 year drought event, while sustaining the region's water resources and related natural systems.

2005-2006 Lower West Coast Plan Objectives

The SFWMD established the Water Resources Advisory Commission (WRAC) to serve as an advisory body to the Governing Board. The WRAC is the primary forum for conducting workshops, presenting information and receiving public input on water resource issues affecting south Florida. Commission members represent environmental, urban and agricultural interests from all four of the District's water supply planning areas.

The SFWMD held Water Supply Plan WRAC Issue Workshops throughout the water supply planning process. Stakeholders representing a cross-section of interests in the region—agricultural, industrial, environmental protection, utilities, local government planning departments, and state and federal agencies—attended the workshops. During the workshops, participants reviewed and provided comments for projected demands compiled by District staff. Individual meetings were held with local government planning departments and utilities, as well as agricultural industry representatives to discuss water demand projections and coordinate planning processes.

At regional WRAC Issue Workshops, stakeholders developed the following six objectives for this plan update, which provide an overall framework for the planning process. The objectives were modified from those developed for the 2000 LWC Plan.

WATER SUPPLY / Identify sufficient sources of water to meet reasonable-beneficial consumptive uses projected through 2025 under a 1-in-10 year drought event.

NATURAL SYSTEMS / Protect and enhance wetland systems and the water resources from harm due to water use, including drawdowns and harmful movement of saline water.

ESTUARINE AND RIVERINE SYSTEMS / Protect and enhance the estuarine and riverine systems through effective water deliveries and management of the water resources.

CONSERVATION AND ALTERNATIVE SOURCE DEVELOPMENT / Encourage conservation measures to improve the efficiency of water use, and support and promote the development of alternative sources.

LINKAGE WITH LOCAL GOVERNMENTS / Provide linkage between the LWC Plan Update and local government comprehensive plans.

COMPATIBILITY AND LINKAGE WITH OTHER PLANNING EFFORTS / Achieve compatibility with other related planning activities within the region.

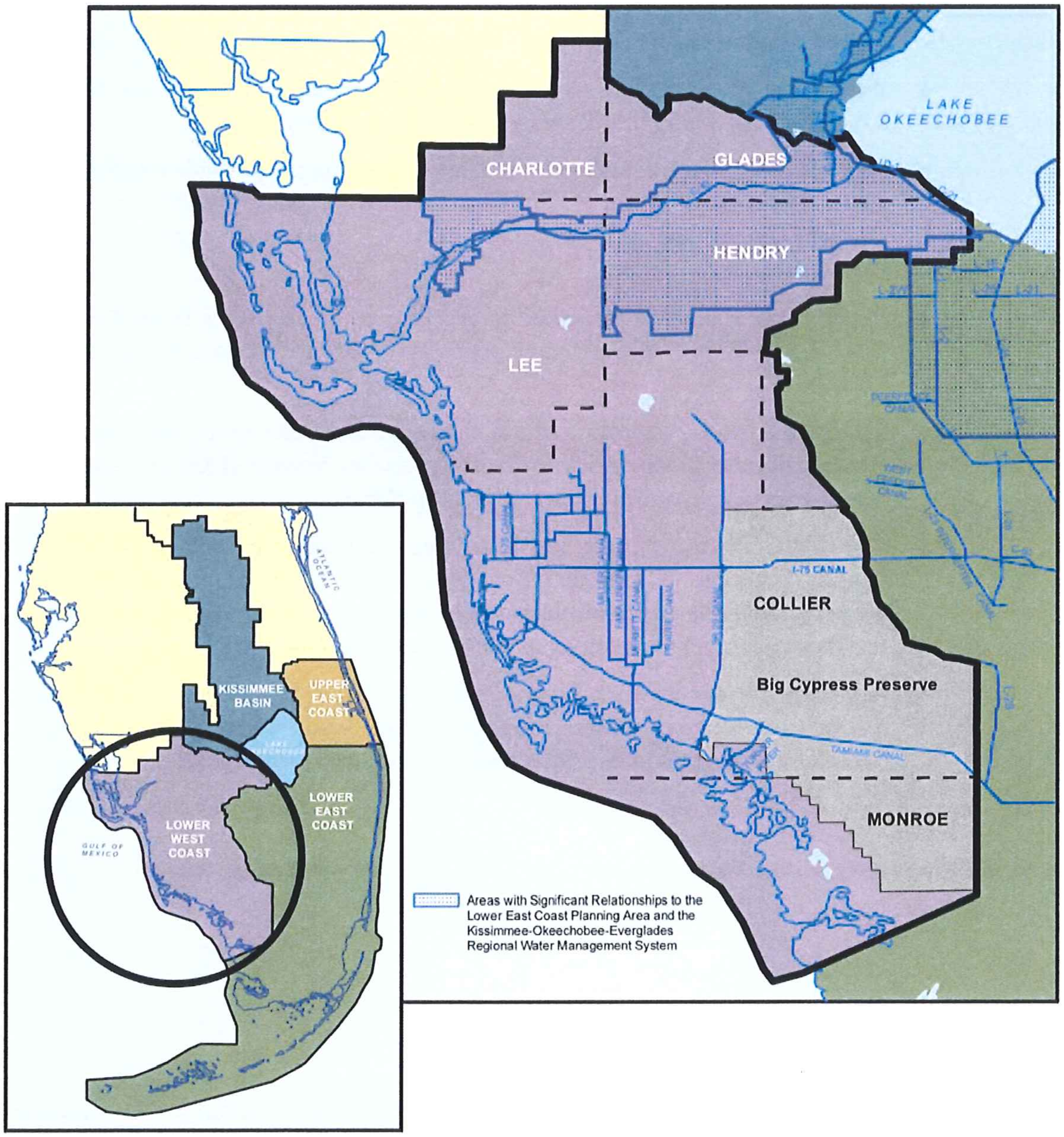


Figure 1. Lower West Coast Water Supply Planning Area.

Characteristics of the Lower West Coast Planning Area

- LWC Planning Area covers approximately 5,129 square miles.
- Includes all of Lee County, most of Collier and Hendry counties, and portions of Glades, Charlotte and mainland Monroe counties.
- Also includes the Big Cypress Basin, one of two administrative units in the SFWMD with its own board of directors. In the LWC Planning Area, the Big Cypress Basin encompasses all of Collier County and part of Monroe County.

- The LWC Planning Area generally reflects the drainage patterns of the Caloosahatchee River Basin and the Big Cypress Swamp.
- Population is expected to increase from 908,500 in 2005 to about 1.6 million by 2025 (U.S. Bureau of the Census 2001).
- Increased population, and industrial and agricultural operations will result in an increase of about 197 million gallons per day (MGD) in water demand during the next 20 years, most of which will come from an alternate source.
- Agricultural acreage is projected to increase by 13,400 acres from 2005 to 2025. Overall, agricultural water use is projected to increase by about 17 MGD.
- Traditional water sources include fresh groundwater from the Surficial Aquifer System (SAS) and Intermediate Aquifer System (IAS) and surface water, primarily from the Caloosahatchee River.
- The LWC Planning Area has long been a leader in alternative water supply projects. Currently, brackish water sources provide about 40 percent of the area's public potable water supply, and reclaimed water use (reuse) is over 90 percent of the wastewater flow for the area.
- Alternative water sources include reclaimed water, surface water captured during wet-weather flows, aquifer storage and recovery (ASR) and surface reservoirs, and brackish surface water and groundwater.

PLANNING PROCESS

1
Planning and Assessment

The process for development of the 2005-2006 LWC Plan Update incorporated extensive public participation, including nine public workshops, as well as coordination with local governments, adjoining water management districts, and other state and federal agencies. A review of previous planning efforts in the region and documentation of activities since the approval of the 2000 LWC Plan were a key starting point of this process. Planning efforts integrated development of Year 2025 demand projections, assessment of existing and projected resource conditions, and formulation of strategies to meet urban, agricultural and environmental water needs.

2
Data Collection, Analysis and Issue Identification

Using the 2000 LWC Plan as a foundation, this water supply plan update involved collecting the latest information about water resources, rainfall, natural resources, water demands, water conservation and land use. Analyses, such as groundwater and surface water evaluations, regulatory information, mapping, wetland studies and other related data, confirmed the validity to previously identified issues and helped identify new issues that may have emerged.

3
Evaluation of Water Source Options

The next phase of the planning process consisted of modifying existing solutions or developing new solutions to address the identified issues. In areas where projected demands exceeded available supplies, solutions included use of alternative water supplies and water conservation. Each water source option was evaluated, and local and regional responsibilities were identified.

4
Water Supply Development

In order to expedite the Water Protection and Sustainability Program as directed by the legislation in 2005, the District requested water users and suppliers to complete project questionnaires identifying water supply projects intended to meet water needs for the next 20 years. This project information was compiled and evaluated by the District, with input from stakeholders, and was used to create **Chapter 7:** Water Supply Development Projects, which evaluates existing and proposed supplies relative to projected future water demand.

ACCOMPLISHMENTS

In preparing the 2000 LWC Plan, the planning process analyses identified key regional issues. These included surface water availability; limits on expanding the Surficial Aquifer System (SAS) and Intermediate Aquifer System (IAS); the water quality of the Floridan Aquifer System (FAS); discharges from Lake Okeechobee to the Caloosahatchee Estuary; and, saltwater intrusion vulnerability in coastal areas.

To resolve these issues, the 2000 LWC Plan contained 29 recommendations that were organized into the following eight water resource development categories:

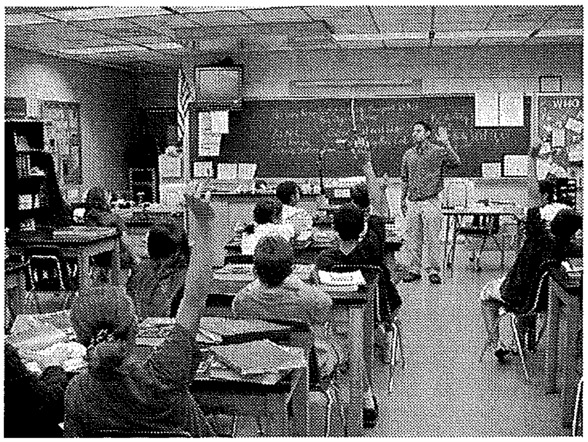
- Conservation.
- Groundwater Resources.
- Reclaimed Water.
- Regional Irrigation Distribution System.
- Seawater.
- Storage.
- Surface Water.
- Related Implementation Strategies.

Development of each of these water source options required regional, as well as local involvement, which the 2000 LWC Plan discussed. Accomplishments and activities in each of these eight categories are discussed in the following sections.

Of 29 specific project recommendations in the eight categories listed in the 2000 LWC Plan, 27 were initiated during the plan's implementation, while two recommendations were not implemented. One program that would have provided the District with access to conduct aquifer and water quality testing during drilling of new municipal production wells was not implemented due to liability issues, and the other recommendation (Well Abandonment Program) was replaced with a regulatory program.

The Five-Year Water Resource Development Work Program, contained in the SFWMD's annual *South Florida Environmental Report, Volume II*, annually summarizes the progress of these recommendations. **Appendix C** tracks all the projects as originally detailed in the 2000 LWC Plan.

Conservation



A Mobile Irrigation Staff Member Teaches Water Conservation to Students

The 2000 LWC Plan identified the need to develop a Comprehensive Water Conservation Program, support existing mobile irrigation laboratories (MILs) and establish additional MIL labs. Coupled with city and county ordinances, the SFWMD adopted year-round conservation measures for landscape irrigation (Rule 40E-24), which became effective in 2003. In addition, the Districtwide campaign regarding landscape irrigation (the "Three-Day-A-Week Watering Plan") was completed in Fiscal Year 2004. There are five MILs in the LWC Planning Area: one agricultural and four urban. The agricultural MIL and two of the urban MILs are funded by the SFWMD. The potential water savings from the three District-funded LWC MILs for the past five years was 0.9 MGD (900,000 gallons per day), with a typical urban MIL performing about 140 evaluations per year. The estimated savings assume that each participant fully implements all of the MIL recommendations.

Another District program, the Water Savings Incentive Program (WaterSIP), funded noncapital cost projects for utilities and property owner associations, and participated in 50-50 cost-sharing for projects. The projects included indoor plumbing retrofits, showerhead and toilet replacements, and outdoor irrigation retrofits, such as rain sensors. Between 2000 and 2004, an estimated 147,000 gallons per day (GPD) of water was saved through the WaterSIP in the LWC Planning Area at a cost of $160,000 to the District.

The conservation effort has been strongly supported by local governments and represents a major accomplishment of the 2000 LWC Plan.

Groundwater Resources

The 2000 LWC Plan addressed the SAS, IAS and FAS in the LWC Planning Area for monitoring, rulemaking and modeling. Groundwater level and water quality monitoring was expanded between 2000 and 2005. Ongoing monitoring efforts continued in the SAS and IAS, and an additional 23 recorders were installed on SAS wells in Hendry County to evaluate local water level trends. The FAS network was expanded to 12 sites within the LWC Planning Area.

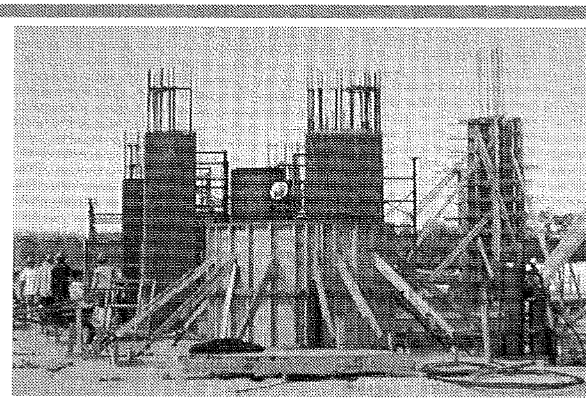
Continuous water-level recorders have been installed at these sites, and periodic water quality assessments are available.

In addition, the District and U.S. Geological Survey (USGS) cost-shared two investigations of the extent of saltwater intrusion in portions of the LWC Planning Area. **Chapter 4** summarizes the findings of these studies under the heading, "Multiple Issues Limit New Traditional Supplies."

Surface and groundwater models for this region are being implemented. Two hydrologic subregional models, the Surficial Aquifer System Model and Floridan Aquifer System Model, have been calibrated and will undergo independent scientific peer review in 2006 before becoming available for use by District staff or stakeholders.

Reclaimed Water and Regional Irrigation Distribution System

The 2000 LWC Plan recommended reclaimed water systems be connected to form a regional irrigation distribution system (RIDS), which led to a District-sponsored feasibility study. The LWC Planning Area continues to be a leader in the state, with 21 of 22 wastewater facilities producing or distributing reclaimed water. In 2004, the LWC Planning Area reused 93 percent of treated wastewater, or 72 MGD.



Construction of Regional Reclaimed Water Treatment Facility

The RIDS Feasibility Study evaluated the potential development of regional irrigation water distribution systems and other options to meet the growing urban irrigation demands of the LWC Planning Area. Accordingly, the objective of the study was to develop preliminary design information for an interconnected irrigation system that would maximize the use of nonpotable water to meet all or a portion of the projected Year 2020 urban irrigation demand.

The RIDS Project included three phases: Phase 1, Feasibility Analysis (completed in 2002); Phase 2, Subregional Analyses (completed in 2004); and, Phase 3, Implementation (which began in 2004). Implementation is being conducted by individual utilities with financial support provided through the District's Alternative Water Supply Grant Program.

The RIDS study area was divided into three subregions, and an inventory of potential alternative sources of supply was identified and prioritized. These preferred projects included reclaimed water/ASR (contingent upon regulatory considerations), surface water/ASR (contingent upon regulatory considerations) and other systems. Of the 32 identified projects, 28 involved aquifer storage and recovery (ASR) and four involved interconnects. It was estimated that these projects could provide up to 221 MGD of urban irrigation water by 2020 at an estimated total capital cost of $208 million.

Seawater

The 2000 LWC Plan identified the option of using seawater from the Gulf of Mexico as a raw water source. The plan concluded that seawater is a potential future supply source, but in 2000, was not cost-effective.

However, the District and Florida Power & Light (FPL) jointly funded a feasibility study to investigate the potential of co-locating a water treatment plant with an electric generating station using saline water for cooling purposes. The study assumed reverse osmosis (RO) as the treatment technology and identified two FPL plants, one in Fort Myers and another in Fort Lauderdale, as having the best potential for development of a water treatment plant. The Seawater Desalination Study is currently being updated.

Storage

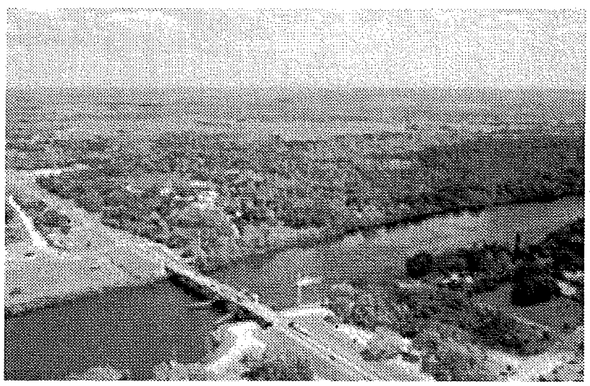
Recommendations in the 2000 LWC Plan recognized three types of potential storage options and the goals associated with each option: aquifer storage and recovery (ASR), regional and local retention projects, and reservoirs.

Aquifer storage and recovery is the underground storage of injected water into an acceptable aquifer during times when water is available and the subsequent recovery of this water during high-demand periods. The District continued to work with other government agencies on water quality requirements and rulemaking to address the use of the FAS for ASR and water use. Of the 28 existing ASR wells in the SFWMD, 14 are located in the LWC Planning Area, including six operational ASR wells, seven wells in operational testing and one inactive ASR well.

Regional and local retention projects increase water availability and evaluate injection of surface water and other sources for saltwater intrusion barriers. The Big Cypress Basin, which encompasses all of Collier County and part of Monroe County, completed four retention projects, creating 365 acre-feet of additional annual retention volume.

Surface Water

Recommendations in the 2000 LWC Plan included projects to use surface water as a supply source. These projects include the Caloosahatchee River (C-43) Basin ASR Pilot Project, the C-43 (Caloosahatchee River) West Reservoir Project, the Southwest Florida Feasibility Study (SWFFS), and the establishment of minimum flows and levels (MFLs) for the Caloosahatchee River and Estuary. The Caloosahatchee River Basin ASR Pilot Project is a component of the Comprehensive Everglades Restoration Plan (CERP). The C-43 (Caloosahatchee River) West Reservoir Project is one of the District's Acceler8 projects. Acceler8 is a program to build high-priority CERP projects.



Caloosahatchee River/C-43 Canal

The Caloosahatchee River ASR Pilot Project was designed to address the technical and regulatory uncertainties regarding regional implementation of ASR projects. The C-43 West Reservoir Project is a component of a larger restoration project for the Caloosahatchee River and Estuary that will capture water from the Caloosahatchee River (C-43) during high-flow times for storage and dry-season use. A location has been acquired in Hendry County to construct a reservoir for 170,000 acre-feet of storage, which is approximately the equivalent of 79,000 Olympic-sized swimming pools—averaging 20 feet deep. Construction of test cells was completed in 2006. Full construction activities are scheduled to begin in the summer of 2007 and slated to finish late in 2010.

A LOCATION HAS BEEN ACQUIRED IN HENDRY COUNTY TO CONSTRUCT A RESERVOIR FOR 170,000 ACRE-FEET OF STORAGE, WHICH IS APPROXIMATELY THE EQUIVALENT OF 79,000 OLYMPIC-SIZED SWIMMING POOLS—AVERAGING 20 FEET DEEP.

The U.S. Army Corps of Engineers (USACE) and the SFWMD are conducting the SWFFS, which will develop a water resources plan for the entire southwest Florida area. The study will also provide for ecosystem and marine/estuary restoration and protection, environmental quality, flood protection, water supply and other water-related purposes. It is anticipated that this study will be completed by 2008.

Related Implementation Strategies

Related implementation strategies include recommended rulemaking and regulatory efforts that applied to several of the future source options from the 2000 LWC Plan, or those that could not be associated with a specific source option.

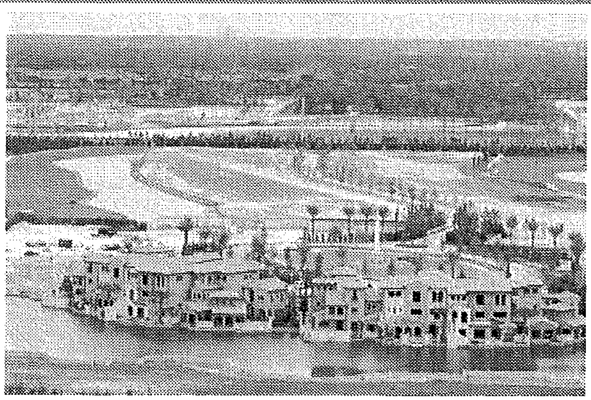
Consumptive use permitting rules were revised regarding the 1-in-10 year level of certainty, resource protection criteria, water shortage triggers, saltwater intrusion, special designations and permit duration. The rules were revised and approved in 2002 and 2003 and the District's *Basis of Review for Water Use Permit Applications* was revised in 2003 (SFWMD 2003), which requires that withdrawals of water must not cause adverse impacts to environmental features that are sensitive to magnitude, seasonal timing and duration of inundation.

The SFWMD established a MFL for the Caloosahatchee River and Estuary in 2000. This rule established a minimum flow of 300 cubic feet per second (cfs) at the Franklin Lock and Dam, or S-79 Structure, on the Caloosahatchee River in order to protect downstream submerged aquatic vegetation communities from significant harm. The MFL Rule recognized that the minimum flow could not be consistently met and identified specific CERP projects as a recovery plan. An update of the Caloosahatchee River and Estuary MFL was initiated in 2003. Minimum flows and levels are further discussed in **Chapter 3**.

In 2001, MFLs were also established for three aquifers in the LWC Planning Area, including the Lower Tamiami, Sandstone and Mid-Hawthorn aquifers. The established MFLs for each were the structural top of the aquifers. In addition, maximum developable limits (MDLs) were established 20 feet above the top of these confined aquifers to ensure that water levels do not reach the MFLs.

WATER SUPPLY PLANNING FOR THE NEXT 20 YEARS

To determine the water supply needs of the LWC Planning Area for the next 20 years, establishing baseline and projected water use information is part of the planning process. **Chapter 2** presents the demand estimates and projections by water use category.



Urban Development in the LWC

In the Lower West Coast (LWC) Planning Area, the population is projected to increase by 74 percent from Year 2005 to about 1.6 million by Year 2025.

...Meeting the updated water supply and demand projections for the current 20-year planning horizon will require a continued focus primarily on nontraditional water supply solutions. This 2005–2006 LWC Plan Update calls for development of alternative water sources to meet most of the region's new water supply needs.

2

Demand Estimates and Projections

Water demands in this chapter are first considered in terms of the demands of the water users or customers. This is the water that directly meets the needs of the users. Additional data in **Chapter 7** and **Appendix D** present the water withdrawal demands (demands on the water resources) needed to meet these user and customer demands. The water withdrawal demands reflect the proposed selections of sources, treatment processes, storage options and reuse of reclaimed water that result from the projects identified in **Chapter 7**. The water withdrawal demands in **Appendix D** are also presented in this chapter.

DISTRICT

User/Customer Demand or **Net Demand:** The water demands of the end user, after accounting for treatment and process losses, and inefficiencies (e.g., irrigation inefficiency). When discussing Public Water Supply, the term "finished water demand" is commonly used.

Withdrawal Demand or **Raw Water Demand:** The amount of water that must be withdrawn from the groundwater or surface water system to meet a particular need. Withdrawal demands are nearly always higher than User/Customer Demands because of inherent treatment and process losses, and inefficiencies associated with delivering water from the source to the end user.

The planning period for this update of the Lower West Coast (LWC) Plan is 2005 to 2025. Extensive baseline information was collected for Year 2000, including population, land use, cropping and irrigation systems, historical water use, climatic conditions, etc. This information was used to develop water use factors, such as per capita finished water demands by utility, which were then used along with projected variables, such as population, to project future water demands. Some data, such as population by county, were updated through 2005 since these estimates have recently become available.

NAVIGATE

Appendix D provides a full description of the methods used to estimate water use for each major usage category and includes estimates of both the customer demands discussed here and the raw water withdrawals, which would result from implementation of the projects discussed in **Chapter 7**.

This chapter provides an overall perspective of the user/customer and water withdrawal demands and associated growth from 2005 to 2025. The water demand projections summarized in this chapter are presented in terms of average weather conditions. **Appendix D** provides demand projections for 1-in-10 year drought conditions. It also provides additional information about water demand within each use category. In the case of agriculture, acreage and demands by crop type are included, and in the case of public water supplies, population and demands by utility are provided. Although not quantified in this chapter, environmental demands are addressed during the water supply planning process using resource protection criteria.

LAW / CODE

A 1-in-10 year drought event is an event that results in an increase in water demand to a magnitude that would have a 10 percent probability of being exceeded during any given year. Subsection 373.0361(2)(a), Florida Statutes (F.S.), states the level of certainty planning goal associated with identifying demands shall be based on meeting demands during a 1-in-10 year drought event.

DEMANDS BY WATER USE CATEGORY

Water demand estimates for 2000 and projections through 2025 were made in five-year increments for each of the six water supply categories (defined to the right). Key results in terms of user/customer demands (see **Figure 2**) specific to the Lower West Coast (LWC) Planning Area for the period of 2005 to 2025 include:

- Regionwide, Public Water Supply demands are expected to increase by 97 million gallons per day (MGD) or 76 percent by Year 2025, at which time this water supply category will represent approximately 27 percent of the region's total water demands.
- Agricultural water use, which is projected to increase by about 17 MGD or 4 percent, will remain the largest consumer of water in the LWC Planning Area.
- Thermoelectric Power Generation Self-Supply is a rapidly growing water use category. Future demand projections reflect the nearly 67 MGD required to serve new power generation facilities planned by Florida Power & Light (FPL).
- The remaining water use categories—Domestic Self-Supply, Commercial and Industrial, Recreational and Landscape—will also experience increased demands totaling 16 MGD by 2025.

DISTRICT

Water Use Categories

Agricultural water is used for crop irrigation, livestock watering and aquaculture.

Public Water Supply refers to all potable (drinking quality) water supplied by water treatment facilities with projected average pumpages for 2025 greater than 100,000 gallons per day (GPD) for all types of customers. The remaining water use categories are all self-supplied.

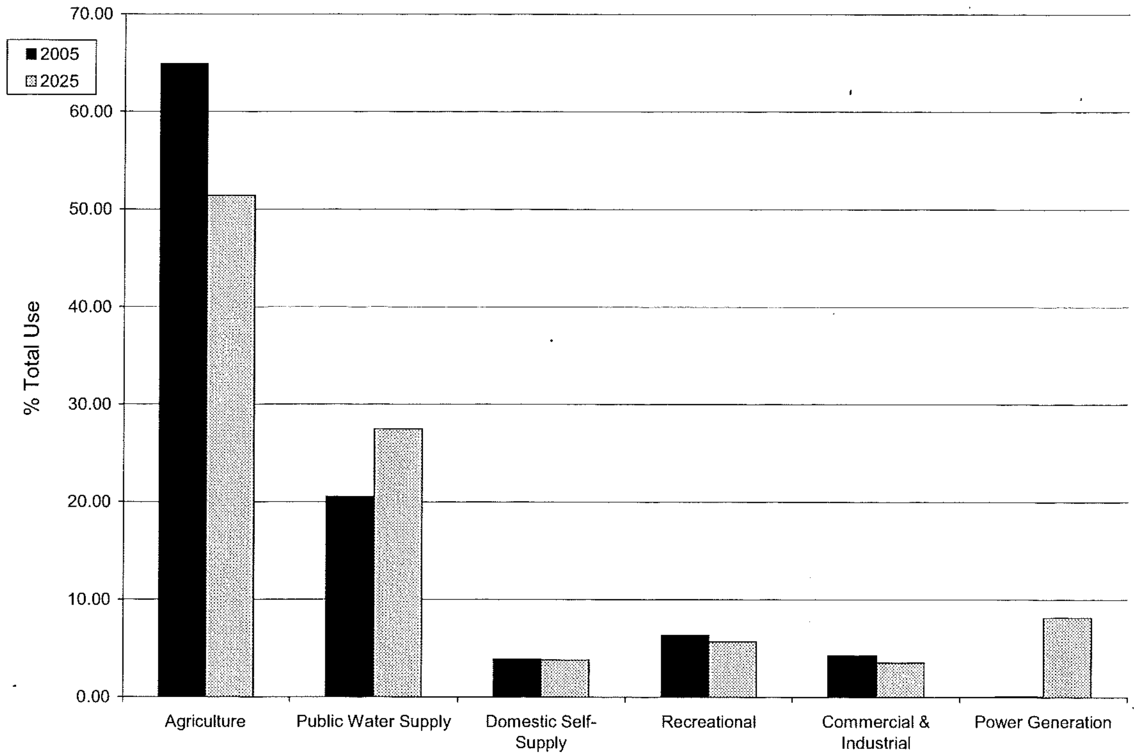
Domestic Self-Supply reflects households served by small utilities (less than 100,000 GPD) and/or private wells.

Recreational water use includes golf course irrigation demand. The Landscape subcategory includes water used for parks, cemeteries and other self-supplied irrigation uses with demands greater than 100,000 GPD.

Commercial and Industrial water uses are business operations using a minimum water quantity of 100,000 GPD.

Thermoelectric Power Generation water is consumed by power plants in the production of electricity.

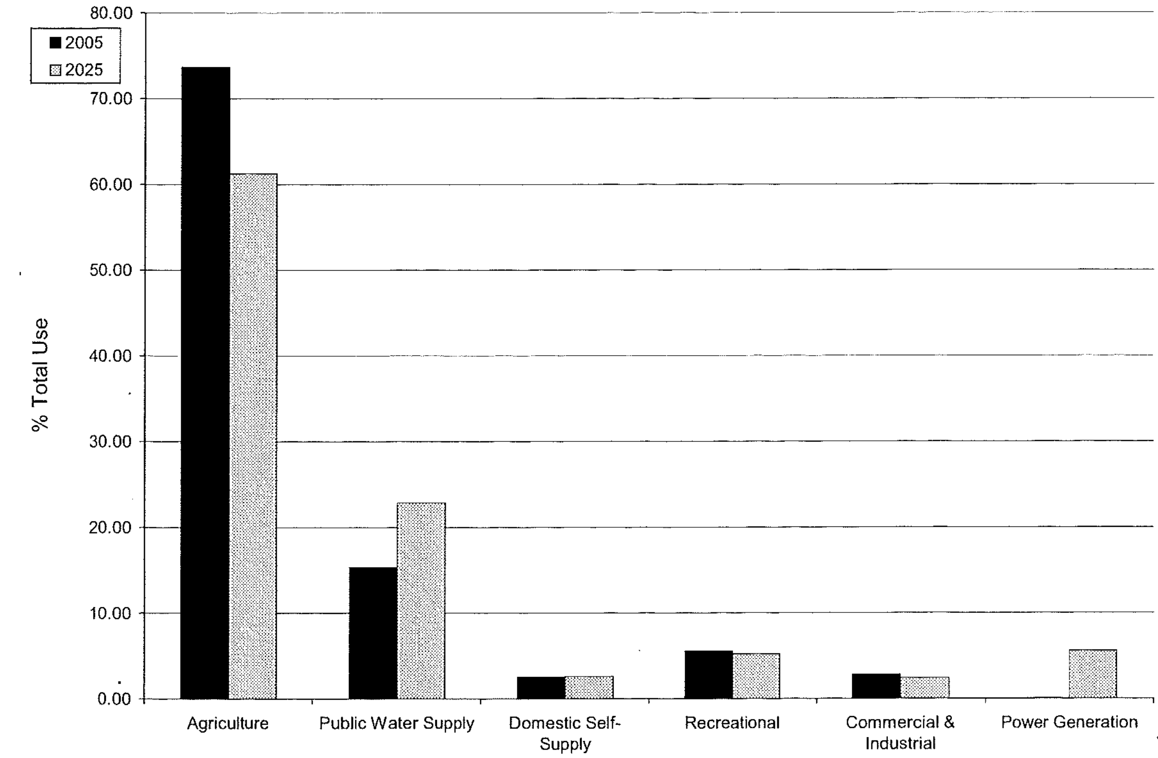
Providing for these increased demands requires a commitment to a coordinated water planning effort. **Figure 2** shows the user/customer water demands by use category.



	Agriculture	Public Water Supply	Domestic Self-Supply	Recreation	Commercial & Industrial	Power Generation	Total
Estimated 2005 MGD	404.8	128.1	24.4	39.5	26.6	0.5	623.9
Projected 2025 MGD	421.8	225.5	31.1	46.6	28.9	66.9	820.8
% Change MGD	4.2%	76%	27%	18%	9%	13,280%	32%

Figure 2. User/Customer Demands - Water Categories as a Percentage of Total Demand in Bar Chart and Average Year Demands and Percentage of Growth in Tabular Chart.

Figure 3 shows the associated withdrawal demands as developed in **Appendix D**. The withdrawal demands are comparable to the demand estimates presented in previous Lower West Coast water supply plans. The water withdrawal demands differ from the user/customer demands for Public Water Supply, Recreational Self-Supply and Agricultural uses. The differences are caused by inefficiencies in delivery or treatment that prevent all the water being withdrawn from being available to meet the user/customer demands.



	Agriculture	Public Water Supply	Domestic Self-Supply	Recreation	Commercial & Industrial	Power Generation	Total
Estimated 2005 MGD	698.1	145.3	24.4	52.6	26.6	0.5	947.5
Projected 2025 MGD	729.2	272.2	31.1	62.2	28.9	66.9	1190.5
% Change MGD	4%	87%	27%	18%	9%	13,280%	26%

Figure 3. Water Withdrawal Demands - Water Categories as a Percentage of Total Demand in Bar Chart and Average Year Demands and Percentage of Growth in Tabular Chart.

POPULATION AND WATER USE TRENDS

The region's population is expected to increase by 74 percent from 2005 to 2025, with Collier and Lee counties experiencing the greatest growth. **Table 1** provides a summary of the population estimates for the counties or portions of counties located in the LWC Planning Area. The distribution of population estimates to individual utilities is based on historical data and projected distributions of population to traffic zone analyses and utility service areas. **Figure 2** provides a summary of the projected water demands under average year conditions between 2005 and 2025 for all water supply use categories.

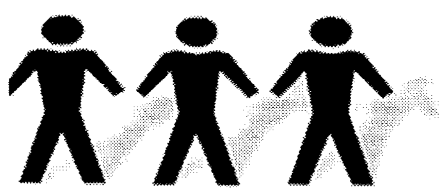
Table 1. Population in the LWC Planning Area, 2005-2025.

	2005			2025		
County Area	Population[a]	Public Water Supply	Domestic Self-Supply	Projected Population	Public Water Supply	Domestic Self-Supply
Collier	317,601	272,130	45,471	608,002	532,037	75,965
Lee	541,398	457,634	83,764	906,199	828,383	77,816
Hendry (Portion in LWC Planning Area)[b]	37,097	26,697	10,400	51,821	41,393	10,428
Glades (Portion in LWC Planning Area)[b]	6,283	3,156	3,127	7,889	3,947	3,942
Charlotte (Portion in SFWMD)[b]	6,163	0	6,163	8,673	0	8,673
Total	908,542	759,617	148,925	1,582,584	1,405,760	176,824

a. Source: U.S. Bureau of the Census, 2001, and University of Florida Bureau of Economic and Business Research, 2006.

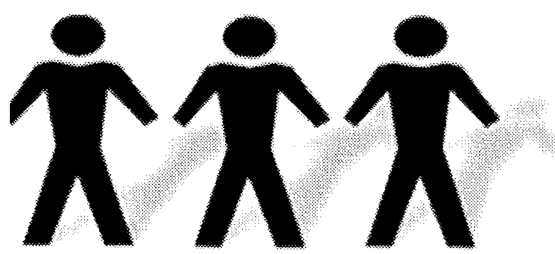
b. See following discussion and Chapter 4 concerning potential urbanization in these counties.

2005



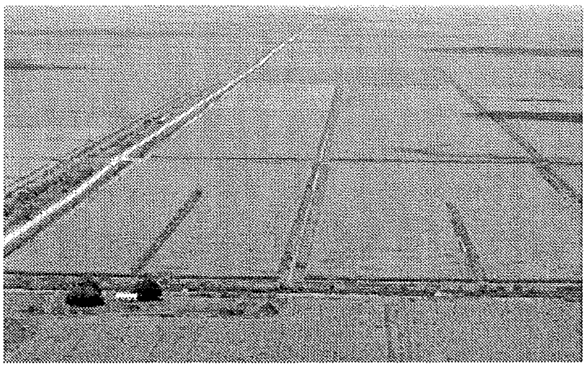
908,542

2025



1,582,584

Agricultural Water Use



Sugarcane in the LWC

Agricultural acreage in the LWC Planning Area is expected to increase by about 13,400 acres between 2005 and 2025, with local declines in cultivated acreage in Lee and Collier counties and increases in Hendry and Glades counties. The overall water use in this category is projected to increase by about 4 percent during this planning period. Relative to the total water use in the LWC Planning Area, the agricultural water use category is projected to decrease from 74 percent of current water withdrawal demands to 61 percent by 2025, reflecting the projected substantial increase in urban sector water uses.

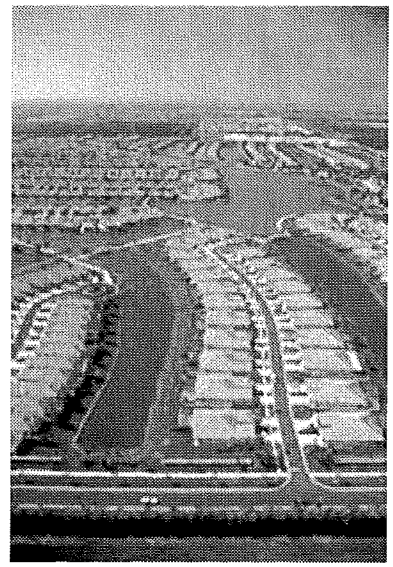
Agricultural water demand reflects projected irrigated acreage, crop and soil types, growing seasons, and irrigation system types and strategies.

Acreage projections are based on the data and methods contained in the land use projection analysis completed by the South Florida Water Management District (SFWMD or District) to support the 2000 LWC Plan and the Southwest Florida Feasibility Study (SWFFS). The agricultural acreage estimates also considered input provided by representatives of the agricultural community.

Agricultural Self-Supply demand calculations for this 2005–2006 LWC Plan Update were made using the Agricultural Field Scale Irrigation Requirement Simulation (AFSIRS) Model. This is a change from the 2000 LWC Plan, which used a modified Blaney-Criddle Model to estimate supplemental requirements for irrigation. Use of the Blaney-Criddle Model generally results in a higher per acre irrigation estimate than the AFSIRS Model. This chapter presents the net irrigation demands for agriculture because the net demands estimate the amount of water farmers need to place into the root zone of crops. Gross irrigation requirements reflect the efficiency of delivery of that water and are affected by the projects discussed in **Chapter 7**. Both net and gross irrigation demands by crop type are presented in **Appendix D**.

Public Water Supply and Domestic Self-Supply

The LWC Planning Area includes all populations of Collier and Lee counties and portions of Hendry, Glades and Charlotte counties. The population of Collier County is expected to almost double over the next two decades, and Lee County's population will increase 67 percent during the same period (**Table 1**). Public Water Supply customer demands grow significantly through the projection period, primarily due to the expected population increase. Domestic Self-Supply demand growth is less significant as most new potable water demand will be served by public water systems.



LWC Urban Development

The permanent resident populations used in this update are consistent with the 2000 Census of population and medium population projections from the University of Florida, Bureau of Economic and Business Research (BEBR 2001). The District used medium-BEBR county populations, except in the case of Collier County for which the District used alternative projections approved by the Florida Department of Community Affairs (FDCA) and supported by its local government's comprehensive plan. These projections are higher than the medium-BEBR projections.

Estimates of Public Water Supply and Domestic Self-Supply water use were made based on 2000 per capita use rates by utility and the distribution of the county level population estimates and projections into utility service areas. For Lee and Collier counties, the distribution of population relied primarily on traffic analysis zone (TAZ) projections, which are used for transportation planning within each county. For the portions of Charlotte, Glades and Hendry counties in the LWC Planning Area, the amount and locations of growth are subject to considerable uncertainty because of rapidly evolving development plans and proposals. However, these plans and proposals have not progressed to the point where alternatives to the medium-BEBR population projections and historical patterns of location of growth within the counties have been approved. For these reasons, the projections for these counties in this plan update use medium-BEBR and historical patterns of development in assigning the growth to utilities and self-supplied users. **Chapter 4** provides a further discussion of potential growth in these areas. Additionally, these projections were coordinated with the utilities that resulted in some adjustments, such as reducing growth for the Island Water Association, which serves the City of Sanibel.

Conservation measures were not factored into the demand projections used in this chapter. Rather, conservation is considered a water source option and discussed in **Chapter 5**.

Recreational Self-Supply

Recreational water use is projected to exceed 46 MGD by 2025, a nearly 20 percent increase over the 2005 estimated use. Recreational Self-Supply water usage projections primarily include water demands for golf course irrigation and are typically identified through consumptive use permits. The acreages for this use were developed as part of the overall geographic information system (GIS) land use analysis supporting the 2005–2006 LWC Plan Update and the Southwest Florida Feasibility Study (SWFFS). Landscape irrigation demand projections are included within this Recreational category.

Commercial and Industrial Self-Supply

Demands for Commercial and Industrial Self-Supply are based on 2000 demands developed and reported by the U.S. Geological Survey (USGS). Because this demand category is small and historical data fail to support any trends in use, the levels are generally held constant through the projection period. The one exception is that industrial use by U.S. Sugar in Clewiston is included with the water utility use in 2005, and is classified as Commercial and Industrial in projection years as a separate utility being established to serve the potable water supply needs of Clewiston.

Thermoelectric Power Generation Self-Supply

The need for additional power supplies is expected to grow as the population in the LWC Planning Area and other portions of south Florida grows. In addition, the major power supplier, FPL, expects that much of the additional generating capacity to be installed will use fresh or brackish water sources and cooling tower technology as a heat rejection method. To date, most of the generating capacity has used flow through cooling, and much of this has been ocean water, the use of which is not covered by the water supply plans.

Florida Power & Light expects to construct five additional power generation facilities in the LWC Planning Area. None of these plants have been sited other than to identify general locations within the LWC Planning Area. As shown in **Figure 2** and **Figure 3**, power generation water use demands are expected to increase to 67 MGD by 2025. These estimates represent the water needed to support power generating capacity proposed to be located in the LWC Planning Area.

DEMAND PROJECTIONS IN PERSPECTIVE

The demand projections presented in this 2005–2006 LWC Plan Update are based on the best information available at this time. However, these projections reflect trends, circumstances and industry intentions that change over time. For example, this plan update expects much greater population growth than what the 2000 LWC Plan anticipated. The growth is large enough that accommodating this population will require infill and development of existing urban areas, as well as development outside of current urban service boundaries. Where this new development will occur and the extent to which it may include historically rural portions of the LWC Planning Area, especially Charlotte, Glades and Hendry counties, are important issues. The potential for rapid development of new urban areas in Charlotte and Hendry counties is such that this LWC Plan Update may require interim amendments. The District will continue to work closely with local governments and monitor growth decisions in these areas.

The agricultural land use projections are also uncertain, first because agriculture is highly dependent on global market conditions, and second, because it is subject to real estate pressures from urban development and ecosystem restoration efforts. Furthermore, factors, such as citrus canker and greening, may have major effects on the future of agriculture within the study area.

In summary, the major driving force behind the significant growth in water demands reflected in this 2005–2006 LWC Plan Update is the region's anticipated population growth. Most of this growth, in absolute terms, is expected to take place in Lee and Collier counties.

The LWC Planning Area's population growth of about 674,000 residents for the 20-year period from 2005 to 2025 is significantly higher than the absolute growth in population of 402,000 residents expected for the 25-year period from 1995 to 2020 in the 2000 LWC Plan. The net result is that the 20-year growth in urban withdrawal demands (all demand sectors except agriculture) in this plan update is 212 MGD, whereas it was forecasted to be only about 63 MGD in the previous plan.

In contrast, gross agricultural demands are projected to increase by 31 MGD between 2005 and 2025, which is similar in magnitude to the 26 MGD growth projected in the previous plan.

3
Resource Analysis

Regional water supply plans provide strategies designed to assure adequate water availability to meet the future urban, agricultural and natural systems demands for at least a 20-year planning horizon. To implement these strategies, an analysis is used to identify water resource conditions that may affect the use of existing resources and development of new supplies to meet Year 2025 projected water demands in the Lower West Coast (LWC) Planning Area. Information in this chapter summarizes previous and ongoing analyses that support this *2005–2006 Lower West Coast Plan Update* (2005–2006 LWC Plan Update), as well as the tools under state law that can be used to protect water resources.

THE WATER RESOURCE

Water for urban and agricultural uses in the LWC Planning Area comes from surface water and three major aquifer systems: the Surficial Aquifer System (SAS), the Intermediate Aquifer System (IAS) and the Floridan Aquifer System (FAS). The Caloosahatchee River (C-43) is a major source of water for agricultural users in the canal basin and for one public water supply system. The SAS and IAS provide most of the fresh water for public water supply and agriculture within the LWC Planning Area. The upper portion of the FAS provides brackish supply.

Caloosahatchee River/C-43 Canal

The SAS is typically divided into two aquifers, the water table and Lower Tamiami. The IAS also includes two aquifers in much of the LWC Planning Area, the Mid-Hawthorn and the Sandstone. The upper portion of the FAS in the LWC Planning Area includes the Lower Hawthorn and the Suwannee aquifers. Zones in the FAS below the

Suwannee typically contain more saline water than upper zones and are not often used for water supply in the planning area.

Within an individual aquifer, hydraulic properties (i.e., ability to yield water to wells) and water quality may vary both vertically and horizontally. Because of this heterogeneity, groundwater supply potential varies greatly from one place to another. Chapter 8 of the *Consolidated Water Supply Plan Support Document* (SFWMD 2005–2006) provides additional information about the aquifer systems, hydrogeologic units and typical aquifer yields in this region. **Figure 4** depicts the generalized geologic cross-section of the LWC Planning Area.

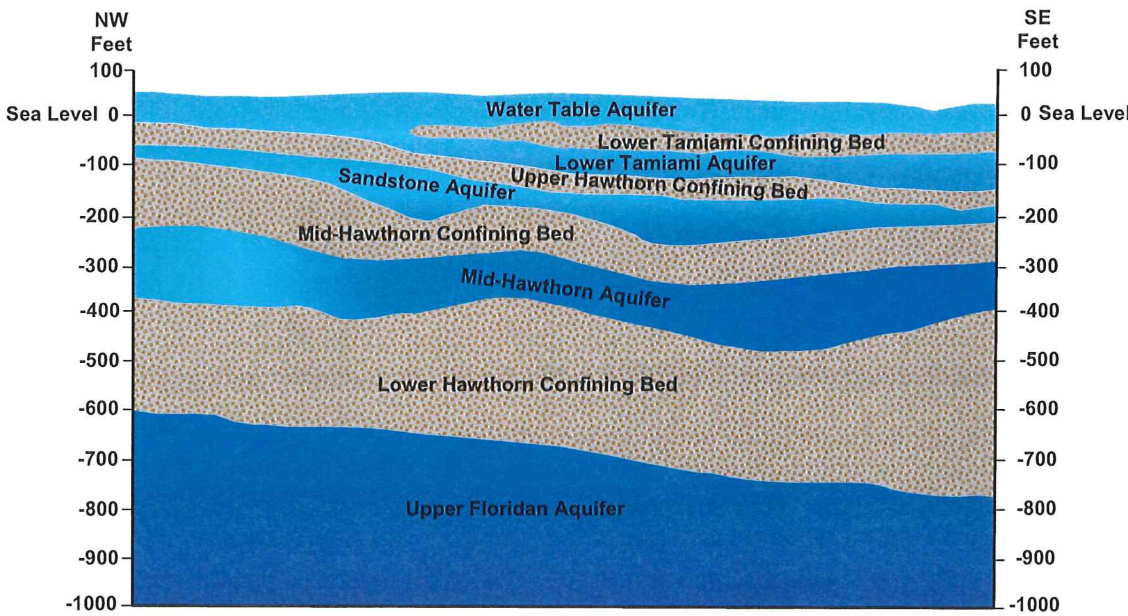


Figure 4. Generalized Geologic Cross-Section of the Lower West Coast Planning Area.

PROTECTION TOOLS AND WATER RESOURCE CONDITIONS

Water resource protection tools are used to protect water supplies for natural systems and human needs. Among these tools are minimum flows and levels (MFLs), maximum developable limits (MDLs), saltwater intrusion criteria and wetland drawdown restrictions. If the MFLs established for priority surface water bodies and aquifers cannot be achieved under existing conditions or may not be achieved in the future, recovery or prevention strategies for those water bodies and resources must be developed. The following section discusses specific resource protection tools and the conditions of historically used fresh water in the LWC Planning Area. Resource conditions and issues are discussed in greater detail in **Chapters 4** and **5**.

LAW / CODE

The South Florida Water Management District (SFWMD or District) is responsible for implementing the statutory provisions in Section 373.042, Florida Statutes, (F.S.), requiring the establishment of minimum flows and levels (MFLs) for surface waters and aquifers at which further withdrawals would be significantly harmful to the water resources of the area. The minimum flow is defined as the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area. The minimum level is defined as the limit at which further withdrawals would be significantly harmful to the resources of the area.

Section 40E-8.021(29), Florida Administrative Code (F.A.C.), defines significant harm to be the temporary loss of water resource functions that takes more than two years to recover.

Section 373.0421, F.S., further requires that once the MFL technical criteria have been established, the District must develop and expeditiously implement a recovery and prevention strategy for those water bodies that are currently exceeding, or are expected to exceed, the MFL criteria.

Chapter 40E-8, F.A.C., contains the MFLs and criteria for specific water bodies and aquifers within the District and also includes the recovery and prevention strategies for each MFL. Additional MFL protection is identified in Chapter 40E-2, F.A.C., as consumptive use permitting criteria for MFLs, and in Chapters 40E-21 and 40E-22, F.A.C., as water shortage criteria for MFLs.

Surficial and Intermediate Aquifers

Minimum Aquifer Levels

Minimum aquifer levels have been developed for the Lower Tamiami Aquifer in the SAS, and the Mid-Hawthorn and Sandstone aquifers in the IAS. The proposed minimum water level criteria for the Lower West Coast aquifer system (SFWMD 2000) concluded that the proposed minimum water levels, which reflect the structural top of the aquifers, were not being exceeded and were not expected to be exceeded during the next 20 years. Therefore, a recovery strategy was not needed. A minimum level prevention strategy is detailed in the *Proposed Minimum Water Level Criteria for the Lower West Coast Aquifer System* (SFWMD 2000) and in Rule 40E-8.421(5).

Maximum Developable Limits

The South Florida Water Management District (SFWMD or District) adopted rules in 2003 for maximum developable limits (MDLs, Section 3.2.4 of the 2003 *Basis of Review for Water Use Permit Applications*) for the LWC Planning Area. The rule states that reasonable assurances shall be provided and that the proposed use shall not cause harmful drawdowns so as to mine semi-confined freshwater aquifers in the LWC Planning Area. The potentiometric head within the Lower Tamiami, Sandstone and Mid-Hawthorn aquifers shall not be allowed to drop to less than 20 feet above the top of the uppermost geologic strata that comprises the aquifer at any point during a 1-in-10 year drought condition. These criteria must be met, except in areas closer than 50 feet from any existing pumping well. The MDL criteria represent a prevention strategy for keeping the SAS and IAS confined aquifer levels above the MFL.

Two notable areas where MDLs are becoming an issue are Cape Coral and Lehigh Acres in Lee County. The Mid-Hawthorn/Sandstone aquifer water levels are declining rapidly in the Cape Coral area and may reach MDLs (about -95 feet mean sea level in well L-4820) within about three years (see **Figure 5**). The Sandstone Aquifer in Lehigh Acres shows a declining water level trend and seasonal water level fluctuations that now average nearly 20 feet, where historical seasonal swings were less than half that (see **Figure 6**). During the spring dry season, the water level in many of the domestic wells that draw water from the aforementioned aquifers in these areas drops to the point where the wells or pumps fail. Alternatives to the continued development of these resources for high-density domestic self-supply must be considered and implemented in the near-term. Accelerating the extension of public water supply lines to communities experiencing dry wells may be part of the solution.

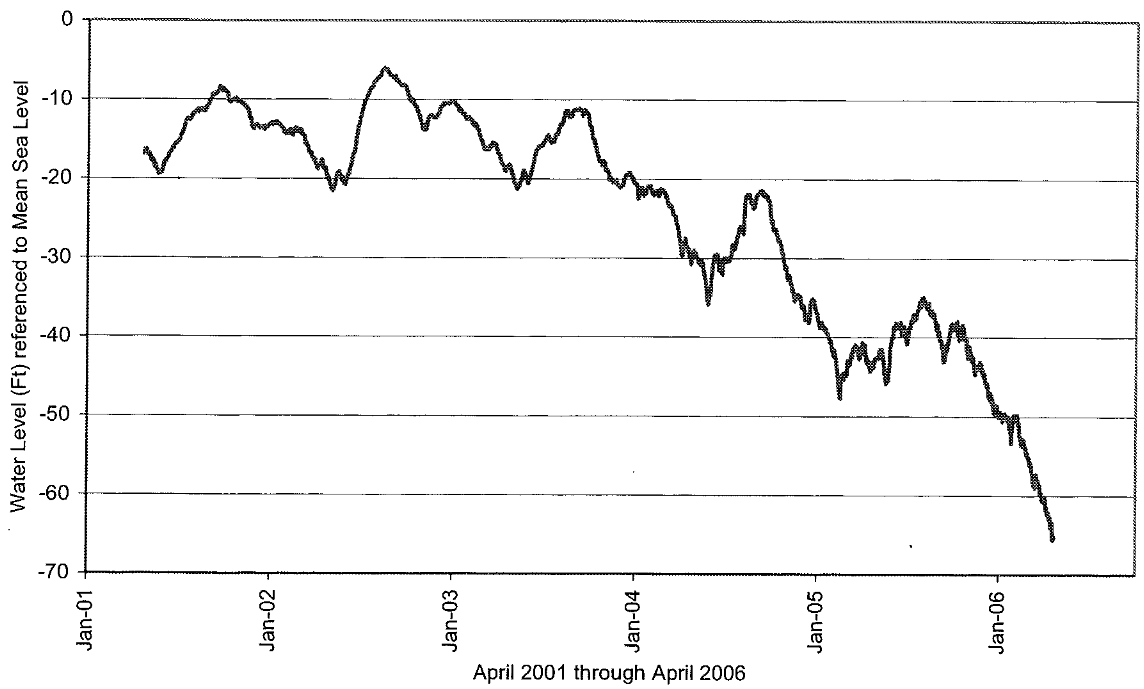


Figure 5. Mid-Hawthorn Well L-4820 Water Levels, Cape Coral (USGS).

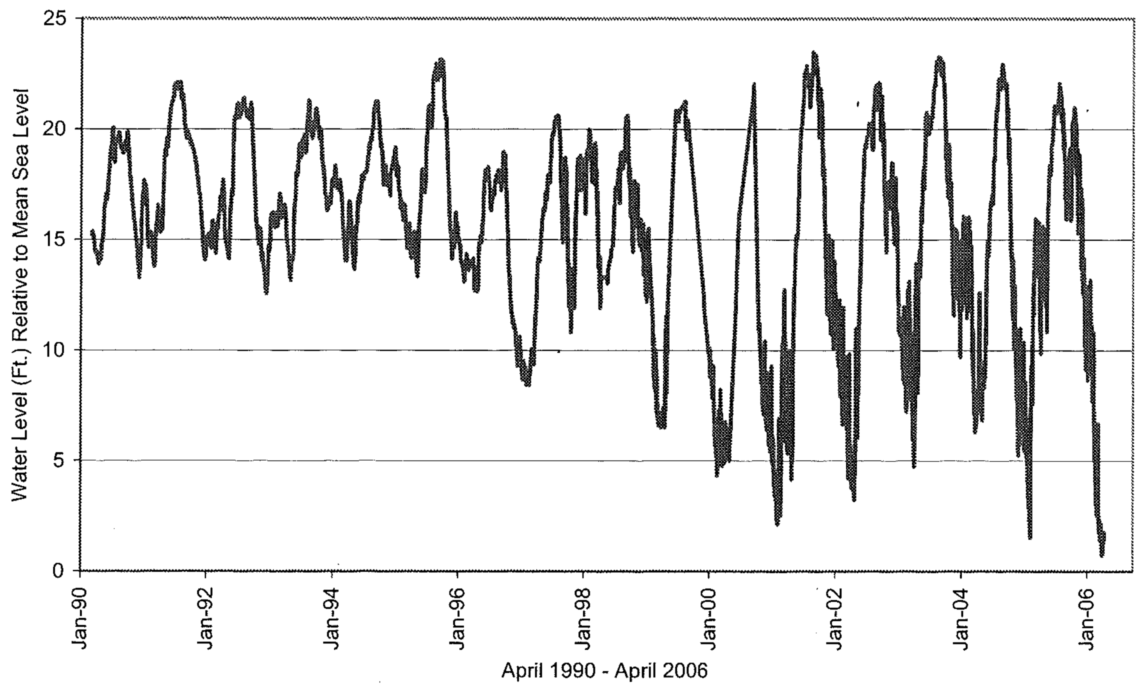
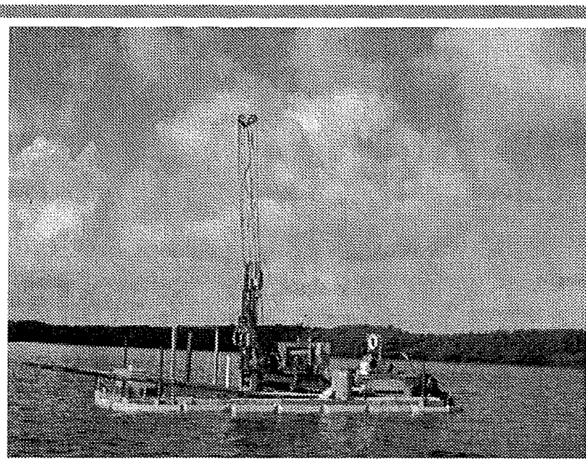


Figure 6. Sandstone Aquifer Monitor Well L-729, Lehigh Acres Area (USGS).

Saltwater Intrusion and Wetland Drawdown Restrictions



Installation of Saltwater Monitoring Wells

Saltwater intrusion, wetland drawdown, aquifer mining and pollution prevention criteria in Chapter 40E-2, Florida Administrative Code (F.A.C.), together define the harm standard for purposes of consumptive use allocation. These harm criteria are currently applied using climate conditions that represent an assumed 1-in-10 year level of certainty. The District's *Basis of Review for Water Use Permit Applications* (SFWMD 2003) outlines narrative standards, numeric standards and assessment methodologies used by the District to determine if a proposed consumptive use meets the conditions of issuance in Chapter 40E-2.301, F.A.C., and therefore, will not cause harm to the resource.

Saltwater intrusion in the SAS (Lower Tamiami Aquifer) and IAS (Sandstone and Mid-Hawthorn aquifers) is a continuing concern, and the SFWMD and U.S. Geological Survey (USGS) cost-shared two recent investigations of saltwater intrusion in portions of the LWC Planning Area (Schmerge 2001, and

Shoemaker and Edwards 2003). These investigations of saltwater intrusion in coastal Lee and Collier counties indicate that the intrusion is an issue along much of the coast, and that the source of the saline water in the SAS and IAS aquifers is probably the Floridan Aquifer. Upward saltwater movement is facilitated by reduced water levels, potentially associated with pumping from these upper aquifers, and open pathways for saline water migration, such as cross-connected wells and karst features.

Caloosahatchee River and Estuary

The MFL Rule established for the Caloosahatchee Estuary states that a minimum mean monthly flow of 300 cubic feet per second (cfs) is required to maintain sufficient salinities at the Franklin Lock and Dam, or S-79 Structure, in order to prevent a MFL exceedance that would cause significant harm to downstream submerged aquatic vegetation communities. A MFL exceedance occurs during a 365-day period when: a) a 30-day average salinity concentration exceeds 10 parts per thousand at the Fort Myers salinity station, or b) a single, daily average salinity exceeds a concentration of 20 parts per thousand at the Fort Myers salinity station. Exceedance of either "a" or "b" for two consecutive years is a violation of the MFL.

Caloosahatchee MFL Recovery and Prevention Strategies

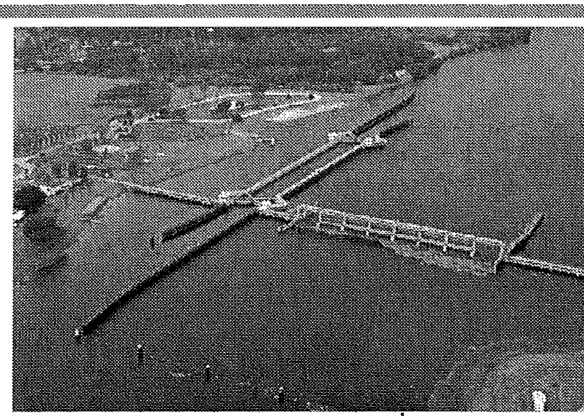
The Caloosahatchee River MFL reports indicated that proposed criteria for the Caloosahatchee River and Estuary (SFWMD 2000, 2003) will be exceeded on a regular and continuing basis until additional storage is provided in the basin to supply the water needed. Therefore, the MFL documents include a recovery and prevention strategy.

The structural and operational features of the recovery plan will be implemented through ongoing SFWMD water supply development efforts, including the development of regional water supply plans, the Comprehensive Everglades Restoration Plan (CERP) and the District's Acceler8 projects. The SFWMD has completed the *2000 Lower West Coast Water Supply Plan* (SFWMD 2000) and a *Caloosahatchee Water Management Plan* (SFWMD 2000), pursuant to Section 373.0361, Florida Statutes (F.S.), which included projects needed to implement the MFL recovery and prevention strategy. The MFL assumes that local basin stormwater contribution downstream of S-79 Structure will not be diminished during dry times.

The CERP includes features that will increase storage in the Caloosahatchee Basin through the construction of a reservoir and aquifer storage and recovery (ASR) wells (USACE and SFWMD 2002). Modeling studies using discharge scenarios, which included the CERP and Lower East Coast (LEC) Plan projects, indicate that the MFLs will be met by 2020 when these facilities in the Caloosahatchee Basin are completed and fully operational.

The MFL Rule, in Section 40E-8.011(3), F.A.C., also states that the minimum flow criteria for the Caloosahatchee River and Estuary should be reviewed and amended as needed within one year of the effective date of the rule. The purpose of this review is to re-examine the technical and scientific basis of the Caloosahatchee MFLs in light of comments by a scientific peer review committee and results obtained from additional field observations, laboratory experiments and numerical model development. The review, contained in the *Technical Documentation to Support Development of Minimum Flows and Levels for the Caloosahatchee River and Estuary 2003 Status Update Report* (SFWMD 2003), specifically evaluated the ability of the 300 cfs discharge at the S-79 Structure to protect the submerged aquatic vegetation.

This study concluded that the 300 cfs target for flows across the S-79 Structure, by itself, probably does not provide sufficient flow to fully protect water resources from significant harm. Additional or improved storage facilities may need to be provided in the watershed, including downstream of S-79. The MFL should incorporate local basin runoff west of the S-79 Structure. Flows higher and lower than the average of 300 cfs should be considered based on the downstream impact. However, before any decisions are made to modify the CERP projects or the MFL criteria, estuarine and biological models need to be completed and fully calibrated, and improved flow measurements need to be obtained, especially for downstream tidal basin inflows.



Franklin Lock and S-79 Structure - Caloosahatchee River

Since establishing the MFL criteria for the Caloosahatchee River, the criteria have been exceeded during three of four years, resulting in one MFL violation (two consecutive years). The expectation is that periodic to frequent exceedances and violations of these criteria will continue to occur until the recovery plan, which includes projects, such as the C-43 West Reservoir Project (discussed under "Other Related Studies and Projects" in this chapter), are constructed and become operational, providing additional flow to the estuary during dry periods. Despite difficulties in meeting the MFL, high-volume flows during 2004, 2005 and 2006 were a much greater concern.

ADDITIONAL RESOURCE PROTECTION TOOLS

Allocating Water through Consumptive Use Permitting

The SFWMD's Consumptive Use Permitting (CUP) Program protects the supply and quality of groundwater and surface water resources by ensuring that water use is reasonable, beneficial and consistent with the public interest, and that it does not interfere with existing legal uses. (Chapter 40E-2, F.A.C., and Section 373.223, F.S.) Applicants for a CUP must provide reasonable assurances that withdrawals will not harm the environment, degrade the resources or adversely affect other existing legal users. Under Florida law, permitted uses and domestic water uses (which are exempt from requirements to obtain a permit) have the legal status of an "existing legal use."

> **LAW / CODE**
>
> The *Water Resources Act* (Chapter 373, F.S.) defines reasonable-beneficial uses as, "...the use of water in such quantity as is necessary for economic and efficient utilization for a purpose and in a manner which is both reasonable and consistent with the public interest." (Sections 373.223 and 373.019(13), F.S.)

Consumptive use permitting has a pivotal role in resource protection, as the criteria used for CUP are based on the level of impact that is considered harmful to the water resource. These criteria are applied to various resource functions to establish the range of hydrologic change that can occur without incurring harm. The hydrologic criteria include water level, duration and frequency components, and are used to define the amount of water that can be allocated from the resource.

Water Shortage Declarations

Pursuant to Section 373.246, F.S., water shortage declarations are designed to prevent serious harm from occurring to water resources. Serious harm, the ultimate harm to the water resource contemplated under Chapter 373, F.S., can be interpreted as long-term, irreversible or permanent impacts to the water resource. Declarations of water shortages by the District Governing Board can be used as a tool to prevent serious harm.

Regionwide Watering Limitations

In 2003, because of resource conditions and increased demand, the District adopted the year-round "Three-Day-A-Week Watering Plan," which imposes outdoor watering limits throughout southwest Florida. Special limitations (40E-24, F.A.C.) were adopted for Lee and Collier counties and the SFWMD portion of Charlotte County, allowing these counties to place additional restrictions on outdoor water use.

Wetland Protection Standards

Wetland protection standards and thresholds have been established in Section 3.3 of the *Basis of Review for Water Use Permit Applications* (SFWMD 2003) to protect wetlands and other surface waters from harm caused by consumptive use withdrawals of water. This rule was based on analysis of wetland monitoring data.

Protections Afforded Through Reservations of Water

The Florida Legislature has defined water reservations as one of several tools that can be used by water management districts to protect water resources potentially threatened by consumptive use activities. Specifically, Section 373.223(4), F.S., provides the basis for establishing reservations as a means to protect fish and wildlife resources.

Water reserved under this statute is not available for allocation for consumptive uses. Under Florida law, permitted uses and domestic water uses (which are exempt from requirements to obtain a permit) have the legal status of an "existing legal use." All presently existing legal uses of water shall be protected so long as such use is not contrary to the public interest.

> **LAW / CODE**
>
> Section 373.223(4), Florida Statutes (F.S.), provides:
>
> The governing board or the department, by regulation, may reserve from use by permit applicants, water in such locations and quantities, and for such seasons of the year, as in its judgment may be required for the protection of fish and wildlife or the public health and safety. Such reservations shall be subject to periodic review and revision in the light of changed conditions. However, all presently existing legal uses of water shall be protected so long as such use is not contrary to the public interest.

There are two types of water reservations being developed by the SFWMD. The first is an *initial water reservation.* Development of initial reservations focuses on determining the volume, duration and timing of existing flows required to protect fish and wildlife resources. The first draft of the initial water reservation criteria for the Caloosahatchee River and Estuary is expected by early 2007.

The second type of water reservation, known as a *project reservation,* will be used in the implementation of CERP-related projects. Project reservations determine the appropriate quantity, timing and distribution of water that is generated by individual CERP projects for the protection of fish and wildlife. Project reservations protect water anticipated to be available in the future through implementation of a project for the protection of fish and wildlife. The water is reserved in advance, ensuring that when a project is completed, those quantities remain available for the protection of fish and wildlife or public health and safety (see *Guidance Memorandum Number 4,* USACE 2005).

ASSESSING WATER RESOURCES WITH MODELING TOOLS

Federal, state and local agencies are currently involved in numerous environmental restoration and water resource development projects that are needed to sustain the quality of life throughout the rapidly growing south Florida region. Since these projects can potentially cost billions of dollars, cost/benefit analysis is crucial. The SFWMD employs several modeling tools to assess water resource conditions and supply availability. Simulation models are used to assess systemwide impacts of proposed modifications to the water resource system.

Previous Modeling Results Indicated Potential Exceedance of Resource Protection Criteria

Modeling submitted as part of CUP applications has consistently supported the analyses and conclusions of the 1994 and 2000 LWC plans, as well as this plan update. Issues identified in past analyses included potential wetland impacts, saltwater intrusion and aquifer drawdowns approaching MDLs.

Modeling was also used to analyze water availability and water demands in the Caloosahatchee Basin. These modeling efforts are described in the *Caloosahatchee Water Management Plan* (SFWMD 2000). Analytical tools used in this analysis included the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) Model, the Water Management Optimization Model and the MIKE SHE Model.

Current and Future Modeling Efforts

Computer models are used to simulate the hydrologic system and to aid our understanding of how water supply and water management projects affect natural and managed systems. Two subregional hydrologic modeling efforts are under way for the LWC Planning Area. One involves creation of a calibrated model of the Surficial Aquifer System (SAS), and the other involves implementation of a groundwater model for the Floridan Aquifer System (FAS). A private engineering firm under contract to the SFWMD is conducting the SAS Model implementation using the USGS modular three-dimensional groundwater flow (MODFLOW) code. The model boundary for the SAS Model is displayed in **Figure 7**, and includes Lee, Collier and Hendry counties and portions of Glades, Charlotte, Palm Beach, Broward, Miami-Dade and Monroe counties.

The SAS Model consists of surface water, the water table aquifer and Lower Tamiami Aquifer of the SAS, and the Sandstone Aquifer of the IAS.

The model was discretized into 765 rows and 622 columns using a square grid with a uniform row and column spacing of 704 feet. The total area of the model is about 5.4 million acres; however, for modeling purposes, about 61 percent of the area is active. The model grid is oriented north-south.

The FAS Model uses the SEAWAT Program and is a joint effort between the SFWMD and Florida Atlantic University. The FAS Model focuses primarily on the Mid-Hawthorn Aquifer of the IAS and the various production zones that comprise the FAS. The model study area, including the active/inactive areas, is shown in **Figure 8**. This area encompasses Lee, Hendry, Collier, Glades and Charlotte counties in the LWC Planning Area, but was extended for modeling purposes to include all or part of Highlands, Hardee, DeSoto, Palm Beach, Broward, Monroe and Miami-Dade counties. Nevertheless, the focus of the study area lies within Charlotte, Glades, Lee, Hendry and Collier counties.

The main advantage of this model, besides its high detail of the geology, is its ability to represent the head, flow and chloride in the system on a daily, weekly or monthly basis, including boundary interactions and the effects of sources and sinks. The model calibration period was from January 1997 to December 2001.

The model was discretized into 575 rows and 300 columns using a square grid with a uniform row and column spacing of 1,500 feet. The total area of the model is about 9 million acres; however, for modeling purposes, about 66 percent of the area is active. The model grid is rotated 30 degrees counterclockwise from the north to align model rows with the principal direction of flow in the Floridan Aquifer.

The FAS has not been used as extensively as fresh groundwater sources within the LWC Planning Area, but its use is anticipated to expand over the next decade as a result of improvements in reverse osmosis (RO) and aquifer storage and recovery (ASR) technologies, and limitations on the use of fresh groundwater resources in many areas.

These models will be available to the public for planning purposes once calibration, documentation and peer review are completed.

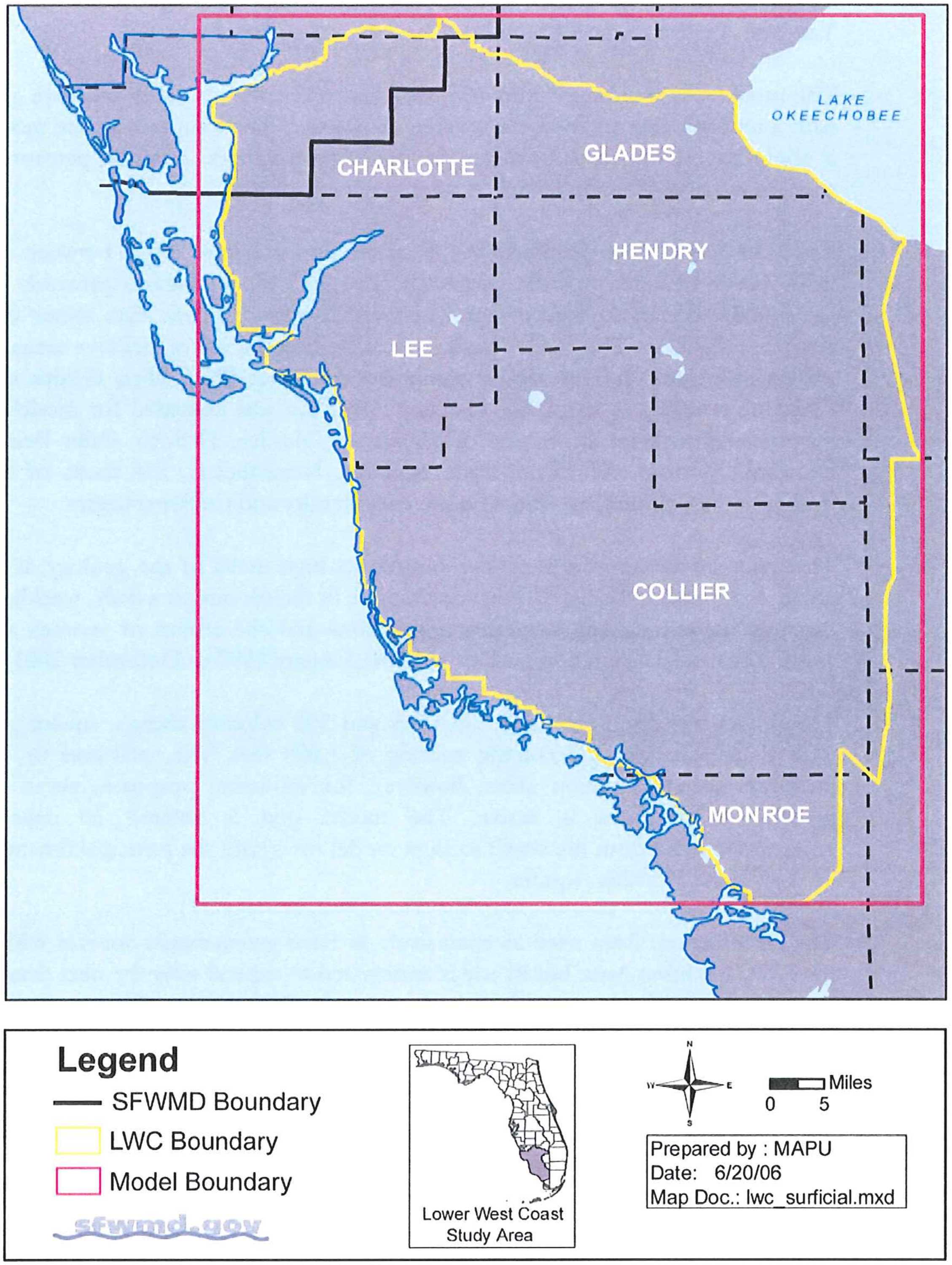


Figure 7. Model Boundary for Surficial Aquifer System Model.

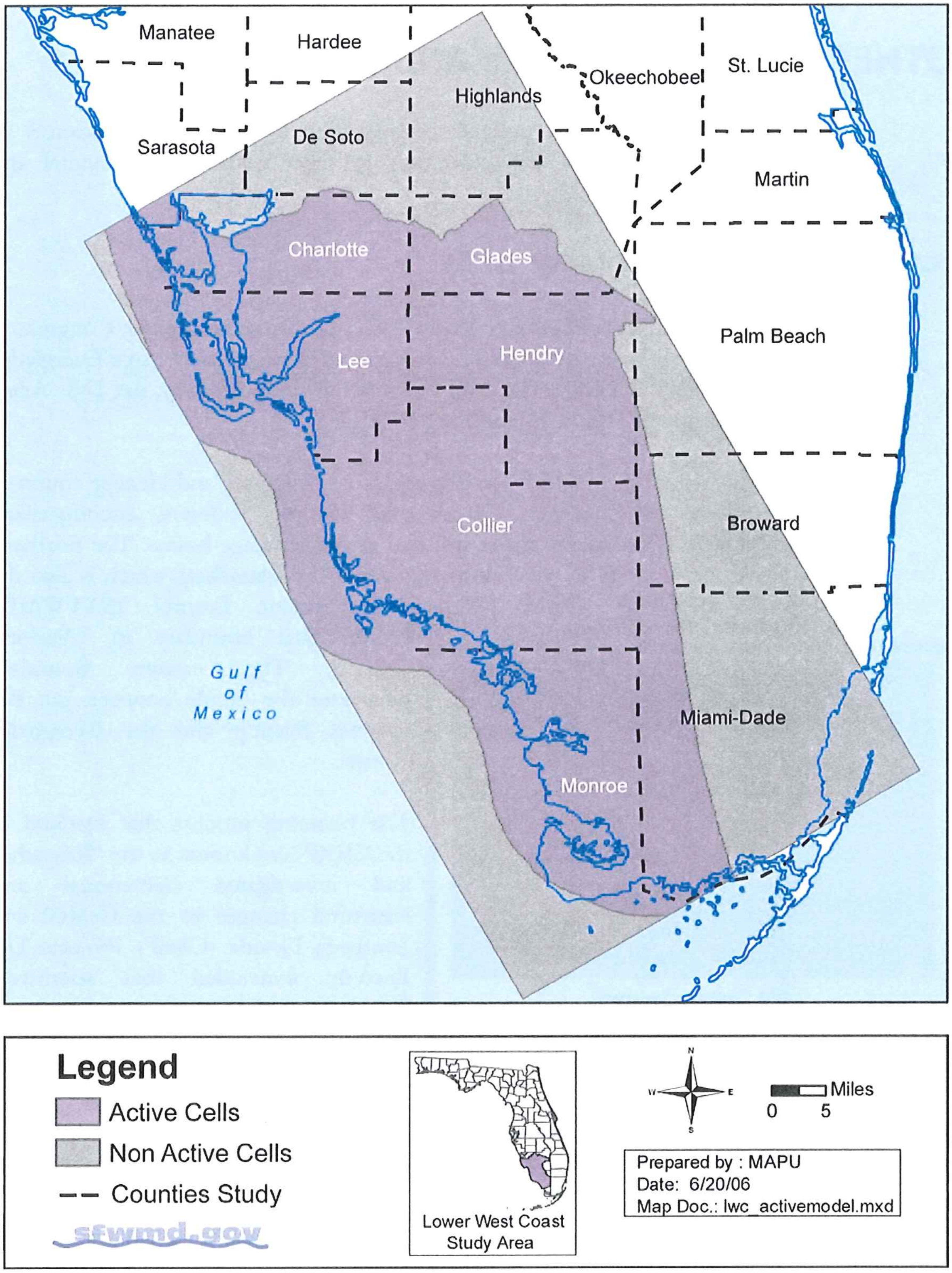


Figure 8. Active Area (shown in purple) and Model Boundary (shown in gray) for Floridan Aquifer System Model.

OTHER RELATED STUDIES AND PROJECTS

Several related studies and projects pertaining to the analysis of resources in the LWC Planning Area are under way to meet future environmental and human demands.

Southwest Florida Feasibility Study

The Southwest Florida Feasibility Study (SWFFS) was authorized by Congress in the *2000 Water Resources Development Act* as part of the Comprehensive Everglades Restoration Plan (CERP). The SWFFS is being conducted by the U.S. Army Corps of Engineers (USACE) and the SFWMD.

The study area includes all of Lee County, most of Collier and Hendry counties, and portions of Charlotte, Glades and Monroe counties, encompassing approximately 4,300 square miles and two major drainage basins. The northern boundary corresponds to the Caloosahatchee River watershed, which is also the SFWMD/Southwest Florida Water Management District (SWFWMD) jurisdictional boundary in Charlotte County. The eastern boundary delineates the divide between the Big Cypress Swamp and the Everglades system.

Big Cypress Swamp

The planning process that resulted in the CERP was known as the "Restudy," and investigated operational and structural changes to the Central and Southern Florida (C&SF) Project. The Restudy concluded that southwest Florida needed a separate assessment of all the water issues it faces, not only those related to the C&SF Project. Water quality and hydrologic data do not exist for much of the region and this lack of information, assessments and monitoring data is a fundamental gap that hinders southwest Florida's long-term water resources management opportunities.

The SWFFS, however, is an important first step and offers the opportunity to use USACE and SFWMD resources to plan for appropriate infrastructure either before or as development occurs. The study will develop a water resources plan for the entire southwest Florida area and provide for ecosystem and marine/estuary restoration and protection, environmental quality, flood protection, water supply, and other water-related purposes. In addition, it will provide a framework to address the health of aquatic ecosystems, water flows, water supply, wildlife, biological diversity and natural habitats, the region's economic viability, and property rights.

The following activities for this study have been completed: a predevelopment vegetation map; development of four subregional MIKE SHE models; a 2000 and 2050 land use map and demand projections; water quality data assessment; identified ecological-estuarine performance measures and targets, and hydrologic stages and flows; and, identification of an initial array of alternatives. It is anticipated that this study will be completed by late 2008.

The LWC Plan Update process used the future land use map from the SWFFS to determine future agricultural acreages, from which future agricultural demands were generated. While the study boundaries of the SWFFS and the LWC Plan Update are the same, the acreage totals for agriculture may be slightly different. This is because the agricultural acreage totals in the SWFFS reflect the model boundaries for that study, which are based on hydrologic boundaries occasionally extending slightly outside of the LWC Planning Area boundary. **Appendix D** provides additional information about future agricultural acreages and demands.

DISTRICT

Comprehensive Everglades Restoration Plan and Acceler8

The Comprehensive Everglades Restoration Plan (CERP) is a framework for the restoration, preservation and protection of the natural systems that also provides for other water-related needs of the region, including water supply and flood protection, and is the centerpiece of the restoration effort to get the water right in south Florida. The CERP's 68 components are forecast to be implemented over a 30-year period. Together, these components are expected to benefit the ecological functioning of more than 2.4 million acres of the south Florida ecosystem, while improving regional water quality conditions, deliveries to coastal estuaries, urban and agricultural water supply, and maintaining existing levels of flood protection.

The CERP was designed as a 50-50 partnership between the state and federal governments. Since the *Water Resources Development Act of 2000*, authorization of projects for the federal partner, the U.S. Army Corps of Engineers (USACE), to move ahead with major storage projects, has not occurred as anticipated. In 2004, the state chose to fund $1.5 billion for eight restoration projects, called Acceler8, through SFWMD's issuance of "Certificates of Participation" bond revenue to expedite the funding, design and construction of 14 restoration components consistent with the CERP Master Implementation Sequencing Plan.

Some of the benefits of Acceler8 are achieving restoration goals sooner, increasing storage capacities for additional flood control and water supply options, providing water flows and hydrology, and improving water quality.

Acceler8 Projects

Of the eight Acceler8 projects, two are located in the LWC Planning Area: the C-43 (Caloosahatchee River) West Reservoir and the Picayune Strand (Southern Golden Gate Estates) Restoration.

Acceler8 Test Cell Pilot Project
C-43 West Storage Reservoir

The C-43 (Caloosahatchee River) West Reservoir, located in Hendry County, is a component of a larger restoration project for the Caloosahatchee River and Estuary. The purpose of the project is to capture water from the Caloosahatchee River (C-43) during high-flow times for storage and dry-season use. The wet-season capture of water benefits the system by reducing high-volume flows that impact the estuary and improving water quality through storage and biological treatment. Stored water will be released at environmentally appropriate rates back into the Caloosahatchee River during dry periods to help meet minimum flows and provide water supply benefits.

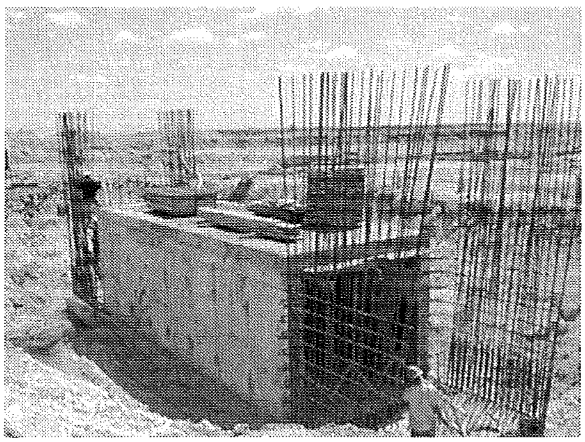
The C-43 West Reservoir will have a total storage capacity of about 170,000 acre-feet (55 billion gallons), on a land area of about 8,000 acres and with a water storage depth of up to 20 feet. Current project activities include construction of test cells at the site and completion of the preliminary design (30 percent). Construction of the full-scale reservoir is scheduled to begin in the summer of 2007 and finish in late 2010.

The Picayune Strand Restoration Project will restore approximately 55,000 acres of partially developed property in southwestern Collier County to a more natural predevelopment condition. This will be accomplished by filling approximately 47 miles of drainage canals; removing over 220 miles of roadways and associated ditches; the construction of over 20 miles of protection levees for private properties; and, the installation of large pump stations with spreader canals to return current canal flows to predevelopment sheet flow conditions across the site.

The project is currently in the design stage. Design of the three major pump stations is in the preliminary stage, while the design of protection levees, canal plugs and road removal/improvements are in the development stage and are awaiting the results of new modeling efforts. These results will determine the location and size of the protection levees, as well as allow the design to progress for other site features.

A more detailed, time-phased modeling effort is beginning for use in evaluating environmental effects and impacts to threatened and endangered species.

Caloosahatchee River (C-43) ASR Pilot Project



Construction of the Acceler8 C-43 Project

The Caloosahatchee River (C-43) Basin ASR Pilot is a project being conducted to assist in the implementation of the CERP. This pilot project is designed to address technical and regulatory uncertainties associated with regional implementation of aquifer storage and recovery (ASR) projects. In the Caloosahatchee River (C-43) Basin ASR Pilot Project, ASR technology continues to be tested and evaluated. The Caloosahatchee River Basin ASR Pilot Project will provide information regarding the characteristics of the aquifer system within the Caloosahatchee River Basin, as well as determine the specific characteristics and acceptability of the Upper Floridan Aquifer System in that area as a storage zone.

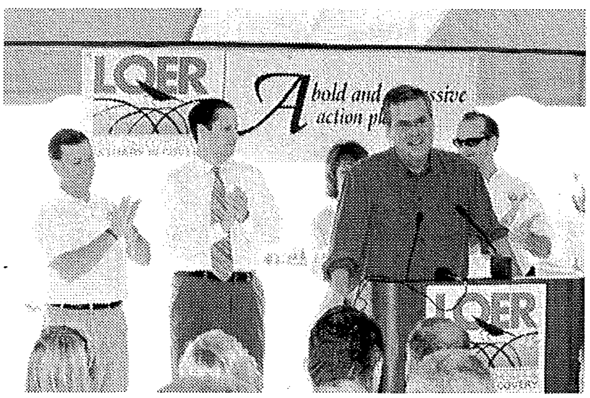
Big Cypress Basin

The Big Cypress Basin is one of two administrative units in the SFWMD. In the LWC Planning Area, the Big Cypress Basin encompasses all of Collier County and part of Monroe County. It is responsible for the operation, maintenance, planning and capital improvements to 169 miles of canals and 44 water control structures.

The Big Cypress Basin Capital Improvement Program (Fiscal Years 2005–2014) includes projects on the Golden Gate Canal System, Henderson Creek and the Baron River, among others, which provide water resource benefits through reduction of overdrainage and restoring groundwater and surface water levels to more natural conditions. In addition to providing environmental benefits, these improvements serve to enhance water supply opportunities by increasing groundwater storage and improving the timing and duration of surface water discharges.

Lake Okeechobee & Estuary Recovery

The Lake Okeechobee & Estuary Recovery (LOER) Plan has been developed to improve water quality, expand water storage, facilitate land acquisition and enhance the ecological health of Lake Okeechobee and the St. Lucie and Caloosahatchee estuaries. State agencies charged with carrying out this plan include the SFWMD, the Florida Department of Environmental Protection (FDEP), the Florida Department of Agriculture and Consumer Services (FDACS) and the Florida Department of Community Affairs (FDCA).



Governor Bush Unveils LOER Program

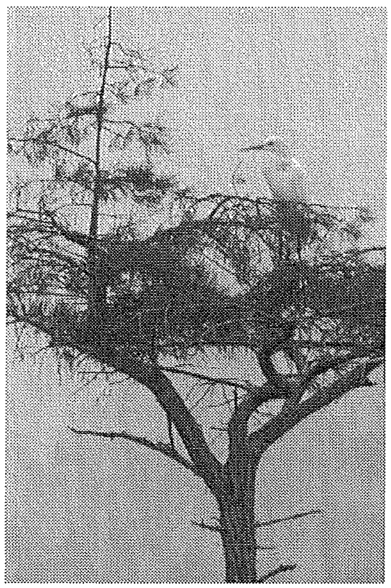
The LOER Plan includes five "Fast-Track" capital projects and numerous interagency initiatives to provide short-term relief and long-term protection. Planned construction projects include the S-154 Basin, S-133 Basin, Taylor Creek Reservoir and Nubbin Slough Stormwater Treatment Area (STA) Expansion, and Lakeside Ranch STA. Additional components of LOER include revisions to environmental resource permit (ERP) criteria for new development in the Upper and Lower Kissimmee basins, Lake Okeechobee, and St. Lucie and Caloosahatchee estuary basins; establishment of total maximum daily loads (TMDLs) for the St. Lucie and Caloosahatchee tributaries and estuaries; mandatory fertilizer best management practices (BMPs); alternative storage/disposal of excess surface water; innovative land use planning; and, revisions to the Lake Okeechobee Regulation Schedule. The LOER Plan also involves the continued implementation of the Lake Okeechobee Protection Program (LOPP) and the CERP's Lake Okeechobee Watershed Project (LOWP).

The USACE is expediting modifications to the Lake Okeechobee Regulation Schedule and developing rules to modify its water shortage plans. The Critical Project Pilot STAs at Nubbin Slough and Taylor Creek are complete. Four pilot projects are moving forward to store water on private land, and a water storage assessment on public land in northern and southern Lake Okeechobee watersheds has been completed. Information from this assessment is being used to develop preliminary designs, costs and schedules for implementation. Temporary pumps are being purchased to address water supply concerns associated with low Lake Okeechobee levels, while permanent forward pumps and structures are under design. The rule revision process to develop additional water quality and quantity criteria for ERP is also under way.

Additionally, in April 2006, an engineering study assessing the condition of the Herbert Hoover Dike around Lake Okeechobee was completed for the District. The study's findings included an opinion that the dike does not meet current dam safety standards, and that internal erosion caused by seepage through the earthen structures is affecting the dike. High lake levels are believed to significantly increase this internal erosion. Recommendations for addressing these conditions include fast-tracking repairs to the dike by the USACE, and lowering lake levels to minimize seepage. Although lowered lake levels have the potential to improve water quality and habitat conditions in the lake, the levels also reduce the water supply available from the lake for agriculture and public supply.

SUMMARY

Resource protection tools, such as MFLs, water reservations, CUP and general aquifer protection criteria, assist in ensuring adequate supplies of water for natural systems and human needs. However, previous and ongoing analyses of historically used water resources in the LWC Planning Area have identified resource development issues that affect the availability of conventional freshwater supplies to meet new demands projected for the next 20 years. These issues are discussed in **Chapter 4**.


Great Egret

It is important to understand the relationship between the different levels of harm referred to in statutes and the various programs the District has to protect the resources. The overall purpose of Chapter 373 of the Florida Statutes is to ensure the sustainability of water resources of the state (Section 373.016, F.S.). To carry out this responsibility, Chapter 373 provides the District with several tools, with varying levels of resource protection standards. Protection programs include the District's consumptive use permitting program, minimum flows and levels (MFLs), MFL recovery and prevention strategies, minimum aquifer levels, maximum developable limits (MDLs), saltwater intrusion and wetland drawdown restrictions, reservations of water, and the District's Water Shortage Program. Determination of the role of each of these and the protection they offer are discussed in Chapter 4 of the Consolidated Water Supply Plan Support Document.

4

Issue Identification

The mission of the South Florida Water Management District (SFWMD or District) is to manage and protect the water resources of the Lower West Coast (LWC) Planning Area by balancing and improving water quality, flood control, natural systems and water supply. Pursuing this mission requires the District to assess the water resources, identify where and when environmental limits may be reached, and take actions to prevent harm to the resources. Rapid growth in southwest Florida has created challenges for water suppliers for years. It was recognized more than a decade ago, in the *1994 Lower West Coast Water Supply Plan*, that the area was approaching the safe supply limits for traditional sources, including fresh groundwater and surface water from the Caloosahatchee River. As a result, the primary new supplies for public water systems in the LWC Planning Area have been developed from alternative water sources. Considering the projected increase of approximately 674,000 residents by 2025, water users and suppliers in the LWC Planning Area must continue to look primarily to alternative supplies, such as brackish water, reclaimed water, and the capture and storage of seasonal surface water supplies, to meet the majority of new water supply needs.

CONSIDERING THE PROJECTED INCREASE OF APPROXIMATELY 674,000 RESIDENTS BY 2025, WATER USERS AND SUPPLIERS IN THE LWC PLANNING AREA MUST CONTINUE TO LOOK PRIMARILY TO ALTERNATIVE SUPPLIES...

Key issues identified in the *1994 and 2000 LWC Water Supply plans* (SFWMD 1994, 2000) and the *2000 Caloosahatchee Water Management Plan* (SFWMD 2000) were that existing conventional supplies, primarily fresh groundwater and surface water from the Caloosahatchee River, would not be adequate to meet future water demands in the LWC Planning Area. The plans proposed alternative supply development to help meet future needs. These and other key issues are confirmed in this *2005–2006 Lower West Coast Plan Update* (2005–2006 LWC Plan Update) and are summarized as follows:

- Saltwater intrusion, wetland protections, and interference with existing users and other concerns will continue to significantly limit increased supplies from these resources.

- Changes to the operational schedule for Lake Okeechobee associated with efforts to lower the lake level for lake and estuarine protection, as well as levee protection, will affect supply availability from the Caloosahatchee River.
- Freshwater high-flow discharges from the Caloosahatchee River and other altered surface water systems in the LWC Planning Area are impacting coastal resources and estuaries. Capturing some of the excess surface and storm water for water supply purposes would improve water supply availability and benefit the environment.
- Additional water storage is needed to create opportunities to fully use reclaimed water and seasonal surface water resources to meet urban irrigation needs.

LIMITED TRADITIONAL SOURCES REQUIRE DEVELOPMENT OF ALTERNATIVE WATER SOURCES

Increasing demand coupled with resource limitations in the LWC Planning Area require the development of alternative water supplies and improved management of traditional supplies. As described in **Chapter 2**, the LWC Planning Area's population is projected to grow to about 1.6 million by 2025. This represents an estimated 74 percent increase in population or approximately 674,000 additional residents from 2005 to 2025. Urban water demands, which include Public Water Supply, Domestic Self-Supply, Recreational, Commercial and Industrial, and Power Generation uses, are projected to increase by 180 million gallons per day (MGD) during this 20-year period, while agricultural water use is expected to increase by 17 MGD, from the current 405 MGD to 422 MGD in 2025.

Multiple Issues Limit New Traditional Supplies

Multiple factors, including water quality deterioration, interference with other existing users and protection of wetlands, continue to limit development of additional fresh groundwater supplies. New supplies from the Caloosahatchee River may be limited by efforts to protect the lake from high water levels and concerns for the integrity of the Herbert Hoover Dike.

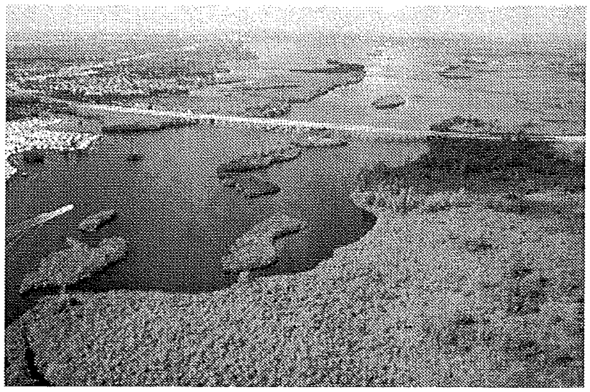
Water quality deterioration is occurring in the Surficial Aquifer System (SAS) and Intermediate Aquifer System (IAS) in coastal Lee and Collier counties, and in various inland areas where pumping from the Mid-Hawthorn and Sandstone aquifers is concentrated. The water table and Lower Tamiami aquifers are the primary producing zones in the SAS, while the Sandstone and Mid-Hawthorn aquifers are the primary producing zones in the IAS. A natural upward head (water level) gradient from the more saline FAS exists in most of the LWC

Planning Area, creating the potential for more saline water to flow from the higher pressure FAS into shallower, lower pressure aquifers. Head reductions in the shallower aquifers that typically occur as a result of pumping and drought allow increased leakage from the FAS to the shallower aquifers and contribute to the deterioration in water quality in the freshwater aquifer systems (Schmerge 2001, and Shoemaker and Edwards 2003).

Aquifer water levels in the Sandstone/Mid-Hawthorn aquifers in Cape Coral are declining rapidly, and, if present trends continue, could reach maximum developable limits (MDLs) within about three years. Water levels in the Sandstone Aquifer in Lehigh Acres show a declining trend and significantly increased seasonal water level fluctuations associated with increased pumpage. Chronic water shortage conditions develop during dry periods for users of the SAS and IAS, particularly in the Cape Coral and Lehigh Acres areas. Concentrations of domestic wells producing from the same aquifers in these areas result in seasonally low water levels, contributing to well failures and water quality deterioration. Increasing population resulting in construction of additional domestic wells each year exacerbates these problems. Alternatives to the continued development of these resources for high-density domestic self-supply must be considered by local governments. Accelerating the extension of public water supply lines to such communities coupled with mandatory hook-up to available municipal lines and required proper abandonment of domestic wells should be considered. Modifications to existing landscape ordinances to further minimize outdoor water needs should also be evaluated.

Water levels in the Lower Tamiami Aquifer in the Bonita Springs area are beginning to increase due to reduction of pumpage. The rising water levels reflect the successful development of brackish water supplies in Bonita Springs from the deeper Lower Hawthorn Aquifer and a corresponding reduction in pumpage from the Lower Tamiami Aquifer. Sustained increases in Lower Tamiami water levels will reduce saline water intrusion and aid in managing and preserving this groundwater resource.

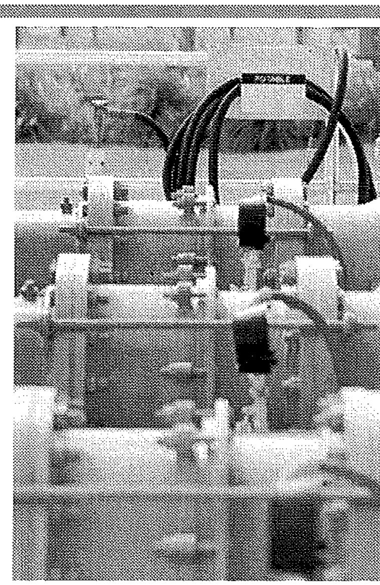
Consumptive use permitting (CUP) regulations were revised in 2003 and included a better definition of wetland protection from pumping-related drawdown to wetland systems. The CUP criteria restrict development of new fresh groundwater supplies that may adversely affect wetlands. Additional freshwater supplies may be available in some portions of the LWC Planning Area, but finding permittable sites has been and will continue to be challenging. Site-specific investigations will be needed. Opportunities may also be created by retiring existing nonpotable uses when land uses change or when reclaimed water is supplied, and by designing dry season recharge systems that rely on supplies of reclaimed water or surface water captured during the wet season.


Caloosahatchee River and Estuary

The Caloosahatchee River currently supplies a large percentage of agricultural water to meet demand in the Hendry and Glades county portions of the LWC Planning Area. Minimum flows and levels were established in 2002 for the Caloosahatchee River and Estuary that restrict withdrawals in the low range of flows. Initial water reservations and Comprehensive Everglades Restoration Plan (CERP) project reservations that will be developed for the Caloosahatchee River will be designed to protect the environment and existing users, but create considerable uncertainty about the availability of water to support new withdrawals directly from the system, or new withdrawals that indirectly affect the system. In addition, maintaining lower management levels on Lake Okeechobee due to the condition of the Herbert Hoover Dike will further reduce water availability from the Caloosahatchee River, particularly in the dry season. The combination of environmental protections, protecting existing legal users and ensuring public safety will significantly reduce opportunities for new withdrawals from the Caloosahatchee River.

Constraints to Optimal Use of Reclaimed Water

Additional storage, primarily aquifer storage and recovery (ASR), for reclaimed water and surface water would significantly improve opportunities to make optimal use of these resources. Reclaimed water use in the LWC Planning Area currently averages about 72 MGD. Although only about 80 MGD is available from reuse facilities on an annual average basis in this region, the timing of reclaimed availability is problematic and, in fact, is one of the factors that limit the number of reclaimed water customers that can be connected. During the wet season, large quantities of reclaimed water are available, but demand is typically low, resulting in the need to discharge some of the reclaimed supply. During the dry season,


Reclaimed Water Facility

demand for reuse water increases significantly, often exceeding the available supply from wastewater treatment facilities, and resulting in the need to augment the reclaimed supply using surface and groundwater water withdrawals.

One issue affecting development of additional ASR is the potential localized mobilization of arsenic in the aquifer associated with the injection and storage of water. Although this has not been shown to be an issue in all ASR situations, it has occurred in some storage zones in Florida. Developing regulatory and scientific means to address the arsenic mobilization issue that will protect public health and safety, while enabling the development of this critical storage, will help ensure a sustainable and economical water supply for the region in the future.

Collectively, urban irrigation demands are met using reclaimed water, the municipal potable system, private domestic wells, other permitted wells (for golf courses, etc.), surface water withdrawals, or any combination of these options. Additional ASR would allow more optimal use of the reclaimed and surface water resources; enable the connection of additional users to the reclaimed system; and, reduce the need to use other freshwater sources to meet urban irrigation demands.

Maximizing Reclaimed Water Efficiencies

The LWC Planning Area has been a leader in the development of reclaimed water supplies, but must continue to make improvements to the region's system. Such improvements will enhance the system's effectiveness to meet urban irrigation demands and lessen the need for pumping fresh groundwater for urban irrigation. These improvements should include, but not be limited to:

- Implementation of additional ASR to enable storage of reclaimed water during low-demand periods and facilitate the capture of seasonal surface water resources.
- Retrofit of all wastewater treatment facilities to produce reclaimed water. Such retrofits are currently planned at four existing wastewater treatment facilities.
- Continue interconnection of reclaimed water systems through the Regional Irrigation Distribution System (RIDS) Project. Interconnection would also promote regional ASR opportunities.
- Continue reclaimed water distribution system expansion, and require lawn/landscape/turf irrigation permit holders within a reasonable distance of reclaimed lines to connect and use that supply when available.
- Improve efficiency of reclaimed water use for irrigation, especially by domestic users.

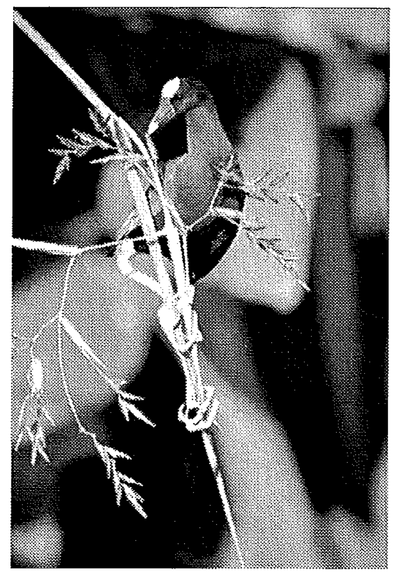
Alternatives

Alternatives to development of additional traditional sources to meet increased water needs include development of brackish groundwater in the Lower Hawthorn Aquifer; expansion of the reclaimed distribution and supply system; the capture of seasonally available surface water; and, improved storage opportunities for surface and reclaimed water. Additional details about these alternative source options are provided in **Chapter 5**.

ENVIRONMENTAL PROTECTION FOR NATURAL SYSTEMS

Wetland Protection

Consumptive Use Permitting Rule 40E-2.301, Florida Administrative Code (F.A.C.), requires that permitted withdrawals not cause harm to wetlands or surface waters. In 2003, the SFWMD adopted rule revisions that better defined wetland protections in the *Basis of Review for Water Use Permit Applications* (SFWMD 2003) for presumption of harm. Because of the large number of wetland systems in the LWC Planning Area, these protections reduce opportunities to develop additional supplies in the Surficial Aquifer, and, depending on local geologic conditions, may also affect new supply development in portions of the IAS.



Purple Gallinule

Regulatory and Environmental Efforts to Protect the Caloosahatchee River

The Caloosahatchee River currently supplies a large percentage of agricultural water demand in the Hendry and Glades county portions of the LWC Planning Area. In 2002, the District adopted a minimum flow and level (MFL) for the Caloosahatchee River—300 cubic feet per second (cfs) at S-79 Structure. The MFL provides a measure of resource protection for existing submerged aquatic vascular plant communities located downstream from the S-79 Structure (Rule 40-8.221(2), F.A.C.). Currently, during dry periods, flows delivered to the river from the S-79 Structure do not meet the established MFL. Consistent with Section 373.042(1), Florida Statutes (F.S.), the District developed a MFL recovery plan.

The District's proposed MFL recovery and prevention strategy for the Caloosahatchee River and Estuary consists of the construction of reservoirs and other projects in the C-43 Basin being completed under the CERP and Acceler8 projects. This includes construction of the 170,000 acre-foot, off-stream C-43 West Reservoir, which is discussed in **Chapter 3**. The C-43 West Reservoir Project is intended to improve both the high-flow and low-flow conditions of the river by attenuating some of the high-flow discharges to the estuary, storing these waters temporarily within the reservoir, and then releasing water to the estuary during dry periods to meet the MFL and proposed CERP environmental targets.

The SFWMD is also in the process of establishing an initial water reservation for the Caloosahatchee River and Estuary. This effort will focus on determining the volume, duration and timing of existing flows required to protect fish and wildlife resources within the Caloosahatchee River and Estuary. Under this program, all presently existing legal uses of water will be protected so long as the use is not contrary to the public interest (Section 373.223(4), F.S.). The first draft of the initial water reservation criteria is expected by early 2007.

Freshwater Discharges Affecting Coastal Resources

Existing freshwater flow regimes are affecting the health of the Caloosahatchee River and Estuary, Estero Bay, and the Naples Bay and Rookery Bay areas. Urbanization in the bay watersheds has changed the timing, quality and distribution of freshwater discharges to these systems. Urbanization, water withdrawals, flood control activities and conditions in Lake Okeechobee have affected the timing and quality of fresh water in the Caloosahatchee River and its estuary. In recent years, high flows and associated water quality impacts to the coastal resources have overshadowed the low-flow events.

On an annual basis, the Caloosahatchee River system typically experiences lower flows during the spring and higher flows during the summer and fall due to local rainfall conditions and releases from Lake Okeechobee. These seasonal swings are occasionally accentuated by severe drought or extreme rainfall conditions that upset the system by either reducing freshwater availability for urban and agricultural demands and the environment, or providing overwhelming volumes of fresh water. Both ends of this spectrum can be harmful to the environment and human use of the resource.

Since 2003, high-flow events have dominated the system. These events are characterized by large volume releases from Lake Okeechobee and high runoff volumes from the agricultural and urban watershed that can overwhelm the estuary with fresh water. Studies have indicated that freshwater discharges at the S-79 Structure in the 300 to 800 cfs range are optimal for the health of the

Caloosahatchee River and Estuary, and that extended periods of flow above 2,800 cfs appear to be detrimental to most biota any time of the year.

The Lake Okeechobee & Estuary Recovery (LOER) Plan includes projects intended to improve environmental and water quality conditions in Lake Okeechobee and its tributaries and estuaries. This program focuses on improved land management practices and environmental protections within the areas contributing water to Lake Okeechobee, as well as the Caloosahatchee River and St. Lucie River basins, which receive water from the lake. Specific projects include the development of 48,000 acre-feet of storage for improvement of water quality flowing into Lake Okeechobee; revision of the lake regulation schedule to maintain lower water levels; and, identification of options for storing and/or disposing of excess surface water within the greater Lake Okeechobee watershed. This program offers direct benefits to the Caloosahatchee River in terms of water quality, timing and volume.

Urbanization in the Estero Bay watershed, which was estimated at 11 percent in 1995, is projected to be in excess of 35 percent by 2025. Deterioration of water quality in the Estero and Imperial rivers and Mullock Creek, all of which are in the Estero watershed, are adversely affecting conditions in Estero Bay.

Coastal rivers and streams in Collier County, including Gordon River, Rock Creek and Haldeman Creek, as well as the historic flowways to Naples Bay and Rookery Bay, have been altered by road and urban development over the past 40 years. Large freshwater discharges through a network of man-made canals and stormwater outlets cause fluctuation in the salinity levels, current flow patterns, as well as increased pollution loading to these coastal bays.

NEW CONNECTIONS TO LOCAL GOVERNMENT COMPREHENSIVE PLANS

During the 2002 through 2005 Florida legislative sessions, the statutory direction to link the water supply planning conducted by water management districts and the land use planning carried out by local governments throughout the state was clarified and strengthened. In general, the changes coordinate local government land use with regional water supply plans, and establish a closer link between development decisions and the availability of water and public facility planning and funding.

Besides a general requirement to coordinate with regional water supply plans, some of the specific water supply-related connections under the new law that now must be addressed in local government comprehensive plans include:

GENERAL REQUIREMENT / Identify water supply sources needed to meet existing and projected water use demands for the established planning period of the comprehensive plan. (Section 163.3167(13), F.S.)

FUTURE LAND USE ELEMENT / Future land uses are to be based on the availability of water supplies, population projections and associated public facilities. (Subsection 163.3177(6)(a), F.S.)

POTABLE WATER ELEMENT / This element must identify alternative and traditional water supply projects, conservation and reuse needed to meet the water needs identified in the regional water supply plan for the local government's jurisdiction. Within 18 months following an approved update of the regional water supply plan, comprehensive plans must: a) incorporate water supply projects from those identified in the regional water supply plan, or propose alternatives; and, b) include a minimum 10-year work plan for building all public, private and regional water supply facilities needed to serve existing and new development. (Subsection 163.3177(6)(c), F.S.)

EVALUATION AND APPRAISAL REPORT (EAR) / Include an analysis of the implementation of the 10-year work plan for building all water supply facilities within the local government's jurisdiction. (Section 163.3191(2)(1), F.S.)

ADDITIONAL ISSUES

Need for Integrated Planning and Water Supply Efforts in Western Hendry and Glades Counties

Hendry County is projecting double-digit growth in annual population and water demand associated with large-scale residential and commercial development in the western portion of the county. Similar conditions are developing in western Glades County. Growth projections used by both counties are inconsistent with the University of Florida, Bureau of Economic and Business Research (BEBR) medium projections. Florida law directs the District to use BEBR in the absence of a ruling to the contrary from the Florida Department of Community Affairs (FDCA). The situation requires an integrated planning effort and discussions with the FDCA on the part of Hendry and Glades counties, and the City of LaBelle. Mounting development pressures will likely require a much more significant water supply initiative in this area than the demand projections within the 2005–2006 LWC Plan Update would indicate. The counties may want to consider forming a regional authority or other multijurisdictional organization to develop water and wastewater facilities to meet these growing needs.

Growth in Eastern Charlotte County

A 13,500-acre new town has been proposed in eastern Charlotte County on a portion of Babcock Ranch. As with growth in western Glades and Hendry counties, this development is not reflected in BEBR projections and therefore is not shown in **Chapter 2**. Large-scale development in remote areas creates challenges for providing adequate infrastructure for governmental services, including water supply. Limited data are available for the Babcock Ranch area, and water supply development would be focused on the use of brackish water from the Floridan Aquifer. This will be addressed in future amendments and/or updates of the LWC Plan Update as additional information becomes available.

Transferring Water between Water Management Districts

Interdistrict transfer is an important issue facing the LWC Planning Area between the SFWMD and Southwest Florida Water Management District (SWFWMD). The issue has been addressed by law under Section 373.2295, F.S., but has had limited implementation. Under Section 373.2295, F.S., interdistrict transfers are defined to include proposed withdrawals of groundwater from one water management district for use outside that district's boundaries; however, interdistrict transfers do not include withdrawals within a single county. If a cross water management district boundary transfer occurs within a single county, then the following public interest test applies, but the procedures do not.

Section 373.2295, F.S., requires the water management district in which the withdrawal is proposed to occur to review the consumptive use permit application. In addition to meeting the typical requirements related to reasonable-beneficial use and interference with existing legal users, users are required to satisfy a unique public interest test. In determining whether such a proposed transfer is consistent with the public interest, the reviewing water management district is to refer to the projected populations, as contained in future land use elements of the comprehensive plans of both the withdrawal and use areas together with other evidence on future needs of both areas. Section 373.2295(4), F.S., states that the proposed interdistrict transfer of groundwater will meet the public interest test: "...if the needs of the area where the use will occur and the specific area from which the groundwater will be withdrawn can be satisfied...."

A second significant definition of the consumptive use permit "public interest" test affecting long distance transport of water was adopted with the amendment of Section 373.223(3), F.S., which became known as the "local sources first" statute. It applies when transport of either ground or surface water across county boundaries is proposed, but not when crossing water management district boundaries. In such applications, the water management district is to consider a variety of public interest factors. For example, the factors include consideration of sources that are closer to the area of use; alternatives to the proposed source, including alternative technologies, such as desalination; potential environmental impacts; and, whether sources are adequate to supply water for existing legal uses and reasonably anticipated future needs of the planning region where the proposed source is located.

The Florida Department of Environmental Protection (FDEP) regulations require that both the sending and the receiving water management districts approve a proposed interdistrict transfer of surface water. The special public interest considerations that must be met include: water conservation measures and reuse implementation in the receiving area; the costs and benefits and environmental impacts that may occur in both areas; and, the present and future needs of the supplying area and whether these needs can be expected to be met.

As Florida's population continues to grow, the development of consensus on resource issues and conditions, and projected future needs along District boundaries are expected to become increasingly important.

SUMMARY

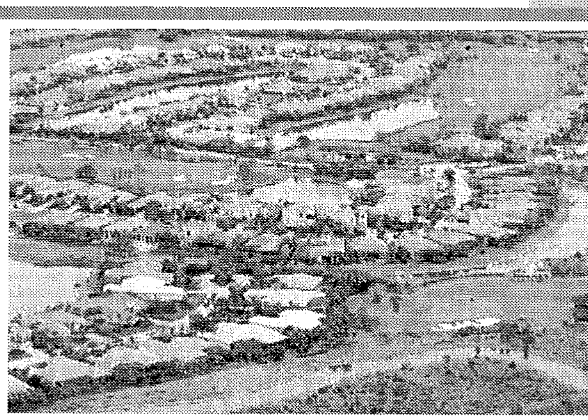
Projections show that the LWC Planning Area population will increase by approximately 674,000 people by 2025. Area water demand will increase by 197 MGD by 2025, with the bulk of that increase in the urban demand sector. The continued growth will require increased efficiencies in water use and alternative water supply development.

Development of alternative water supplies in the LWC Planning Area is well established, as it has long been recognized that historical fresh groundwater and Caloosahatchee River water resources cannot support the ongoing growth in this region. Meeting the water demands associated with future growth will require an even greater focus on alternative water supplies and conservation than in the past. Efforts to develop traditional freshwater resources may be possible in some areas considering local hydrologic conditions, demand on the resource, and management options, such as rehydration opportunities and seasonal pumping schedules.

Other resource issues facing the area are also tied to the growing population in the LWC Planning Area and other parts of south Florida. Urbanization of watersheds in the Lee and Collier county areas is resulting in deterioration of water quality in streams discharging to coastal waters, such as Estero Bay and Naples Bay. The Caloosahatchee River and Estuary are similarly affected by urban and agricultural runoff, flood control discharges from Lake Okeechobee, and also from saltwater migration up the river during low-flow periods associated with drought and high water use.

Resource protection strategies and projects are under way to address these issues, including establishment of initial reservations for the Caloosahatchee River and construction of the C-43 West Reservoir to capture a portion of high flows for release during dry periods. Ongoing watershed protection projects in Lee and Collier counties include the 55,000-acre Picayune Strand Restoration Project, which will hold more water on the land, thereby improving the timing and dispersion of discharge to coastal waters.

These issues will require constant attention to ensure that the water resources and the environment that depends on these resources remain protected, while the needs of a growing population are met.



Urban Development in the LWC

As populations and the demand for available water supplies increase in South Florida, there is an increased need to balance the protection of the natural systems with efficient use of current and future water resources.

5

Evaluation of Water Source Options

Florida's 2005 legislative session created the Water Protection and Sustainability Program, which strengthens the link between water supply plans and local government comprehensive plans. In addition, the new legislation provides state and water management district cost-sharing funds for alternative water supply development. The bill adds new requirements for the water supply development component of the regional water supply plans by making the plans more specific. The intent is to make the plans more useful to local water suppliers in developing alternative water supplies, and then provide permitting and funding incentives to local water suppliers if they choose a project included in the plan.

As prescribed by Section 373.0361(2), Florida Statutes (F.S.), water supply options, including traditional and alternative water supplies, as well as conservation and reuse projects were evaluated to meet the future urban, agricultural and natural systems needs of the

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Section 373.0361(2), Florida Statutes (F.S.), provides:

A list of water supply development project options, including traditional and alternative water supply project options, from which local government, government-owned and privately owned utilities, regional water supply authorities, multijurisdictional water supply entities, self-suppliers and others may choose for water supply development. In addition to projects listed by the district, such users may propose specific projects for inclusion in the list of alternative water supply projects. If such users propose a project to be listed as an alternative water supply project, the district shall determine whether it meets the goals of the plan, and, if so, it shall be included in the list. The total capacity of the projects included in the plan shall exceed the needs identified in subparagraph 1. and shall take into account water conservation and other demand management measures, as well as water resources constraints, including adopted minimum flows and levels and water reservations. Where the district determines it is appropriate, the plan should specifically identify the need for multijurisdictional approaches to project options that, based on planning level analysis, are appropriate to supply the intended uses and that, based on such analysis, appear to be permittable and financially and technically feasible.

Lower West Coast (LWC) Planning Area. Traditional sources in the LWC Planning Area include the Surficial Aquifer System (SAS) and Intermediate Aquifer System (IAS), and fresh water from surface sources, such as the Caloosahatchee River. Alternative water supplies or nontraditional sources include seawater or brackish water, surface water captured during wet-weather flows, new storage capacity, reclaimed water, storm water for consumptive uses, and any other nontraditional source used by the planning region. These options may make additional water available from historically used sources by providing improved management of the resource, or there may be a new source of water specific to that service area.

The following evaluations of water source options for the LWC Planning Area are made within the context of the issues previously identified in **Chapter 4** and are specific to this region. Each water supply option includes a brief discussion on the sustainability of the resources, potential impacts to the natural systems and economic costs. The *Consolidated Water Supply Plan Support Document* (SFWMD 2005–2006) provides additional information pertinent to the estimated costs of each option. The costs presented in this chapter and the *Consolidated Water Supply Plan Support Document* are intended primarily to enable comparison of the general costs of one type of supply relative to another. These costs must not be viewed as a substitute for the detailed evaluation that should accompany site- and utility-specific feasibility and design studies necessary to make decisions about, and to construct, such facilities.

TRADITIONAL SOURCES

DISTRICT

Traditional sources include those sources that have historically been used as the primary source of water. Traditional sources can change from region to region based upon the ease of source availability and water quality. Where traditional sources have been determined to have limited availability, alternative sources of water must be identified and developed.

In the LWC Planning Area, traditional sources of water have typically included the SAS, IAS, fresh surface water from the Caloosahatchee River, and, to a limited extent, other fresh coastal surface water systems.

As discussed in earlier chapters, the SAS and IAS are the primary sources of fresh groundwater for urban and agricultural use in the LWC Planning Area. However, any significant increase in withdrawals from these aquifer systems will continue to be constrained by resource protections limiting saltwater intrusion, wetland impacts, and impacts to existing legal users and other regulatory considerations. Additional supplies may be developed and permitted from these traditional sources depending on the quantities required, local resource conditions and the viability of other supply options. Opportunities may also exist to capture additional freshwater resources for public supply through expansion of the reclaimed system and retirement of existing irrigation or domestic wells. Wetland rehydration efforts using reclaimed or stored surface water to mitigate pumpage impacts may also allow limited increases in freshwater production.

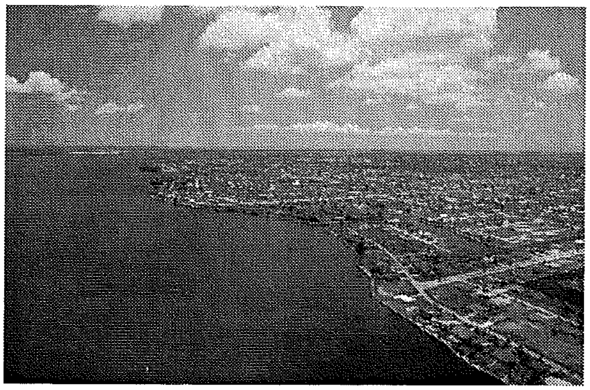
Costs for individual components of water supply projects, such as wells, pumping equipment, pipeline and treatment facilities, are discussed in the *Consolidated Water Supply Plan Support Document.* In order to provide an estimate of fresh groundwater supply development costs for comparative purposes with other supplies, a hypothetical fresh groundwater supply project was evaluated based on component costs in the *Consolidated Water Supply Plan Support Document,* and personal communications with District engineering design consultants. The project presumed development of a new 5-MGD water supply. The project employed lime softening followed by chlorination as the treatment process.

Project costs include facility design, construction, general operation and maintenance, land costs, and raw and finished water storage (at the treatment facility site). No high-service pumping or connection costs for finished water transmission mains were included in the estimate. It was assumed all pipelines required a 35-foot permanent easement. Property requirements include 1 acre per MGD for treatment capacity, and 1 acre per production well site. Unit costs (per acre or per square foot) are identified in **Appendix H**. Storage needs were presumed at 50 percent of treatment capacity, with design and construction costs for storage estimated at $0.32/gallon. Annual operation and maintenance of storage and pipelines was assumed at 2 percent of the capital cost of installation. Source water is presumed to be provided by six, 1-MGD wells arranged in a linear pattern extending 2.5 miles out from the treatment facilities. Unit costs ($/1,000 gallons) reflect capital amortized at 5.65 percent for 20 years. **Table 2** summarizes the results of this exercise.

Table 2. Estimated Project Costs for Development of Fresh Groundwater.

Treatment	Total Capital	Capital $ per gallon of Capacity	Annual O & M	Unit Cost ($/1,000 gallons)
5 MGD Lime Softening	$14,700,000	$2.90	$1,100,000	$1.28

The Caloosahatchee River is a significant water source for agricultural use in Hendry and Glades counties. Water withdrawals support sugarcane, citrus and row crop operations, and other agricultural uses. Capture of public supply water from the river is limited to about 5 MGD by Lee County. The reliability of existing supplies from the Caloosahatchee River should be improved through the construction of the C-43 West Reservoir in Hendry County. The reservoir will capture water at high-flow times from the system and release water to meet environmental requirements and existing user demands in the low-flow periods.



Caloosahatchee River

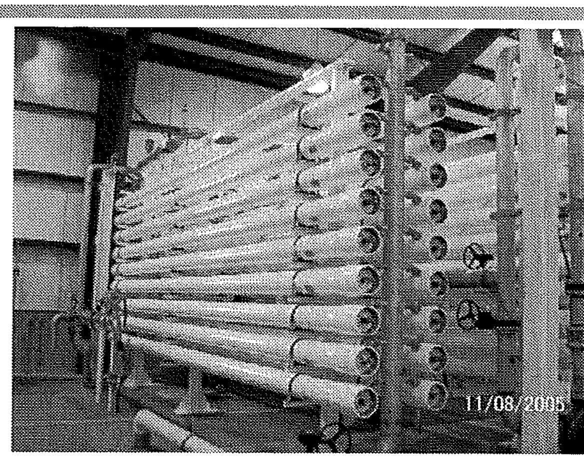
Future increases in supply from the Caloosahatchee River may be constrained by a revised management schedule for Lake Okeechobee, which is designed to maintain lower levels in the lake; the MFLs established in 2002; initial water reservations that are currently being developed for the system; and, the environmental requirements associated with the Comprehensive Everglades Restoration Plan (CERP) and Acceler8 projects. The viability of the Caloosahatchee River to meet new water supply needs will be determined after the new lake management schedule is selected and the effects of the other regulatory and project constraints on this system are evaluated.

ALTERNATIVE WATER SUPPLY SOURCES

Each alternative water supply source option is discussed in this section to identify its potential for use in the LWC Planning Area.

Seawater

This source option involves using seawater (typically 35,000 milligrams per liter (mg/L) total dissolved salt) from the Atlantic Ocean or the Gulf of Mexico as a raw water source for desalination. The ocean is an unlimited source of water (salt water) from a quantitative perspective; however, removal of salts (desalination) is required before potable and irrigation uses are feasible. To accomplish salt removal, a desalination treatment technology would have to be used, such as distillation, reverse osmosis (RO) or electrodialysis reversal (EDR).



North Lee County Water Treatment Plant
Reverse Osmosis Membrane Unit

As part of the 2005–2006 water supply planning process, it was concluded that seawater desalination is a potential alternative supply that merits future consideration. At this time, water cost data for seawater desalination facilities range from $2.49/1,000 gallons for the 25-MGD Tampa Bay Water desalination plant in Hillsborough County to $8.77/1,000 gallons for water from the new 36-MGD facility in the country of Singapore. Co-location of seawater desalination facilities with power plants appears to reduce costs. The SFWMD will be conducting a Co-Located Desalination Feasibility Study and a Pilot Saltwater Desalination Project during the next three years. The study location for the feasibility and pilot work has yet to be determined. Based on pilot study results and data from Tampa Bay Water's 25-MGD Seawater Desalination Plant, which is expected to be operational in the fall of 2006, seawater desalination will receive additional consideration in the next LWC Plan Update.

Brackish Surface Water and Groundwater

The Upper Floridan Aquifer is the principal source of brackish supply in the LWC Planning Area. Supply from the Floridan Aquifer is not considered to be a limited resource in the LWC Planning Area. It is expected that a majority of new municipal quantities for the region will be met using the Floridan Aquifer System (FAS). Water from the FAS throughout the planning area is generally nonpotable due to salinity and requires desalination or blending to meet potable standards. Utilities in the LWC Planning Area using the FAS as a drinking water source typically employ reverse osmosis (RO) or an electrodialysis (ED) process to purify the water for distribution and use.

DISTRICT

Brackish groundwater is typically defined as water with a total dissolved salt concentration between 1,000 milligrams per liter (mg/L) and 10,000 mg/L. The terms fresh, brackish, saline and brine are used to describe the quality of the water. Although brackish supplies in the low range of these salinities may be used for some agricultural purposes, they do not meet public drinking water standards. Advanced treatment technologies, such as reverse osmosis (RO), electrodialysis (ED) or electrodialysis reversal (EDR), must be employed before this type of supply is suitable for human consumption.

Agricultural operations in the LWC Planning Area use water from the FAS primarily as a supplemental irrigation or blending source when surface water or supplies from the SAS or IAS are limited, and as a primary source in areas where the salinity of the resource is acceptable for irrigation. Although some water quality deterioration in the Floridan Aquifer has been associated with pumping, no other environmental impacts have been identified in association with use of this resource.

In order to provide an estimate of brackish groundwater supply development costs for comparative purposes with other supplies, a hypothetical brackish groundwater supply project was evaluated based on component costs in the *Consolidated Water Supply Plan Support Document,* and personal communications with District engineering design consultants. The project presumed development of a new 5-MGD finished water supply from a brackish groundwater source and water treatment through RO followed by disinfection using chlorine.

Project costs include facility design, construction, general operation and maintenance, land costs, raw and finished water storage (at the treatment facility site), and concentrate disposal (via deep well injection). No high-service pumping or connection costs for finished water transmission mains were included in the estimate. All other project costs and assumptions relative to property requirements and water storage needs are the same as in the fresh groundwater example. Source water is presumed to be brackish (less than 10,000 mg/L total dissolved solids (TDS), delivered by eight, 1-MGD wells arranged in a linear pattern extending 3.5 miles out from the treatment facilities. Treatment recovery is assumed to be approximately 80 percent. **Table 3** summarizes the results of this exercise.

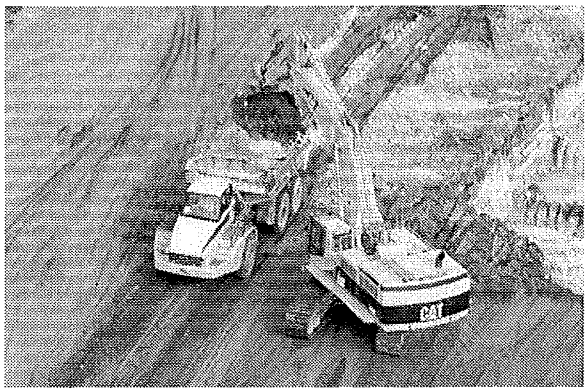
Table 3. Estimated Project Costs for Development of Brackish Groundwater.

Treatment	Total Capital	Capital $ per gallon of Capacity	Annual O & M	Unit Cost ($/1,000 gallons)
5 MGD Brackish Groundwater RO	$25,400,000	$5.08	$2,100,000	$2.33

Surface Water Captured Predominately During Wet-Weather Flows

The capture of surface water, primarily during wet-weather conditions and storage either aboveground or underground for future use, can provide a stable water supply for municipalities, agricultural uses and environmental management. Typically, the six-month, summer rainy season provides more than 65 percent of the annual rainfall in southwest Florida, creating the opportunity for such withdrawals.

Often these systems are designed around a flow-based withdrawal schedule (Tampa Bay Water, Alafia River, Water Use Permit 2011794). This enables initiation of withdrawals when flow in the river/canal systems rises above a specified environmental level and allows the capture of a percentage of flow from the system above that environmental level. Systems such as these capture only an environmentally sustainable percentage of flow, ensuring the freshwater needs of the river and estuary are not adversely affected by the withdrawals. Yields will depend primarily on the seasonal flow characteristics of the surface water system, the freshwater requirements of the estuary and the availability of storage.



C-43 West Reservoir Construction

In the LWC Planning Area, the District is designing and testing such a system for the Caloosahatchee River. The C-43 West Reservoir, which is under construction in Hendry County and one of the District's Acceler8 projects, will capture a portion of the river's flow during wet-weather conditions and store it in an off-stream reservoir. During dry periods, water will be released from the reservoir to meet environmental requirements in the Caloosahatchee River and to sustain existing water withdrawals on the river. Opportunities to capture seasonal surface water resources also exist in a number of the canal and river systems in the Big Cypress Basin.

In order to provide an estimate for the development of potable surface water supplies for comparison with other sources, a hypothetical fresh surface water supply project was evaluated based on component costs in the *Consolidated Water Supply Plan Support Document,* and data from Tampa Bay Water's Master Water Plan projects. The project estimate presumed development of a new 5-MGD supply from a surface water source, and the associated raw water aquifer storage and recovery (ASR) system needed to ensure the 5-MGD project yield. The withdrawal facility was sized at 15 MGD to enable harvest of a full year's supply within 153 days from June through October. Water not immediately processed for distribution at the surface water treatment facility was filtered, disinfected and placed in a raw water ASR system. Recoveries from the ASR system were presumed to be 75 percent.

Treatment for the finished water supply includes conventional surface water treatment (coagulation, flocculation, sedimentation, filtration and disinfection). The finished water treatment and disinfection system was sized to operate at 5 MGD. A separate 10-MGD filtration and disinfection system was included on-site for the raw water ASR system.

Project costs include facility design, construction, general operation and maintenance, land costs, and raw and finished water storage. No high-service pumping or connection costs for finished water transmission mains were included in the estimate. Property needs were presumed to be 2 acres for the intake and pump station. Capital costs for treatment facilities included land costs for a 5-acre treatment plant site, and an additional 10 acres (same location) for the ASR system. It was presumed the surface water intake would be located within 1 mile of treatment facilities and that all 10 ASR wells would be located adjacent to the treatment facility. Pipeline assumptions, including easement requirements, and required ground storage are the same as in the fresh groundwater and brackish examples. **Table 4** summarizes the results of this exercise, with costs for the associated raw water ASR system shown separately in the table.

Table 4. Estimated Project Costs for Development of Finished Water.

Project	Total Capital	Capital $ per gallon of Capacity	Annual O & M	Unit Cost ($/1,000 gallons)
5 MGD Finished Surface Water, coagulation/sedimentation/ filtration	$17,600,000	$3.52	$770,000	$1.24
Raw Water ASR (10 wells, 1.53 billion gallon storage plus filtration/disinfection)	$9,900,000	$1.98	$1,100,000	$1.02
Total	$27,500,000	$5.50	$1,870,000	$2.26

New Storage Capacity for Surface Water or Groundwater

Storage is an essential component of any supply system experiencing variability in the availability of supply. In Florida, the most common types of water storage include in-ground reservoirs, aboveground impoundments and ASR.

Aquifer Storage and Recovery Technology

Aquifer storage and recovery technology shows promise both for treated and untreated water by providing a storage option during periods of water availability. This technology is currently being used by several utilities at the local level. The level of treatment required after storage and recovery depends on the use of the water, whether it's for public consumption, surface water augmentation, wetlands enhancement, irrigation or a barrier for saltwater intrusion. Because ASR provides for the storage of water that would otherwise be lost to

> **DISTRICT**
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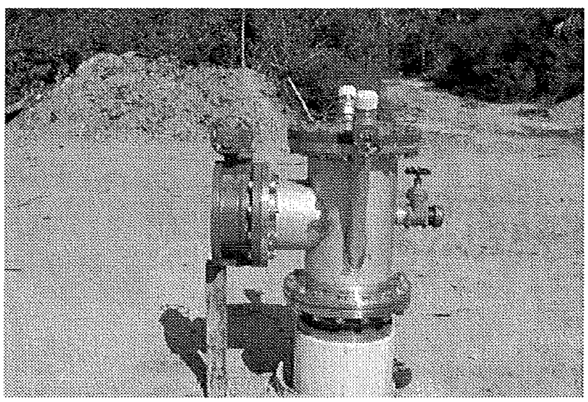
> Aquifer storage and recovery (ASR) is the underground storage of storm water, surface water or reclaimed water, which is appropriately treated to potable standards and injected into an aquifer through wells during wet periods. The aquifer (typically the Floridan Aquifer System in south Florida) acts as an underground reservoir for the injected water, reducing water loss to evaporation. The water is stored with the intent to later recover the water for treatment and reuse in the future during dry periods.

tide or evaporation, it represents a crucial water supply management strategy for Florida's future.

To date, a total of 28 ASR wells have been constructed within the District. Most of these wells store potable water, although other source waters include raw groundwater, and raw or treated surface water. Approximately 25 percent of the 28 existing ASR wells are operational, while 43 percent are in various stages of operation or testing. The remaining wells are categorized as inactive. In addition to urban uses for ASR, the District, in cooperation with the U.S. Army Corps of Engineers (USACE), is pursuing regional ASR systems as part of the CERP. More than 300 ASR wells are planned as part of the CERP, and most of these are planned around Lake Okeechobee. In the LWC Planning Area, there are currently 14 ASR wells, six of which are operational, seven are in operational testing and one is inactive.



Aquifer Storage and Recovery Well

Project costs for two ASR systems were evaluated in the *Consolidated Water Supply Plan Support Document*, including a 2-MGD potable ASR system and a 5-MGD raw surface water ASR system. Unit cost estimates ranged from \$0.44/1,000 gallons for the potable system to \$1.02/1,000 gallons for the surface water system. The unit cost difference between the potable ASR and the raw water ASR system reflects a remote location, and pipeline costs for the surface water ASR well and a microfiltration treatment system for the injected raw surface water.

Local and Regional Reservoirs

Surface reservoirs provide storage of seasonably available resources for use during dry times, improve irrigation efficiency and can be used to improve stormwater quality. For example, small-scale (local) reservoirs are used by individual farms for storage of recycled irrigation water or the collection of local stormwater runoff. These reservoirs are also useful in providing water quality treatment before off-site discharge. Large-scale reservoirs (regional) are used for stormwater attenuation, water quality treatment in conjunction with stormwater treatment areas and for storage of seasonally available supplies for use during dry times.

Due to environmental and topographical considerations in south Florida, new surface reservoir storage is generally off-stream, meaning no damming of the river is involved to create the reservoir. Water is typically pumped from rivers and canals during wet-weather conditions and stored in an aboveground or at-grade reservoir for use in the dry season. The previously mentioned C-43 West Reservoir in Hendry County will operate in such a manner. The C-43 West Reservoir's design includes up to 52 billion gallons of off-stream storage for water captured from the Caloosahatchee River during high flows. Reservoir releases will be made to meet environmental requirements and sustain the resource for existing permitted users.

Off-stream reservoirs recently completed in Florida include the Tampa Bay Reservoir in southern Hillsborough County, which began operation in spring 2005. This system has the capacity to store up to 15 billion gallons of water from the Alafia and Hillsborough rivers and the Tampa Bypass Canal. Based on the pumping and treatment system installed, the annual average water supply yield of the two rivers and the Tampa Bypass Canal without the reservoir is about 40 MGD. Adding the reservoir to that system increased the average annual yield to over 60 MGD.

Reservoir construction costs are discussed in Chapter 3 of the *Consolidated Water Supply Plan Support Document*. Based on that information, capital costs per gallon of storage for a 5 billion gallon reservoir range from about $0.015/gallon to $0.017/gallon depending on the reservoir footprint. Analysis suggests land costs affect the total project costs more than berm height for reservoirs designed to accommodate water depths less than 12 feet. The only data readily available on reservoir operation and maintenance costs in southwest Florida are from Tampa Bay Water's C.W. "Bill" Young Reservoir in Hillsborough County (Tampa Bay Water 2005). The contracted annual reservoir operation and maintenance costs for this 1,200-acre, 15 billion gallon reservoir averages $867,000/year, including an optional algaecide application, which comprises about 40 percent of that average annual cost. Calculated per acre of water surface, this represents an annual operation and maintenance estimate of $722/acre. Calculated per gallon of storage volume, the cost is $0.0001/gallon. These annual costs reflect general operations, water quality maintenance and preventative maintenance. Annual costs do not reflect any significant capital repairs that may be periodically required.

Reclaimed Water

> **DISTRICT**
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> Reclaimed water is water that has received at least secondary treatment and basic disinfection, and is reused after flowing out of a domestic wastewater treatment facility. Reuse is the deliberate application of reclaimed water for a beneficial purpose, in compliance with the Florida Department of Environmental Protection (FDEP) and water management district rules.

Reclaimed water is a key component of Florida's regional water supply plans for both wastewater management and water resource management. Reclaimed water strategies in the regional water supply plans can include such measures as further development of urban reclaimed water systems, reclaimed water system interconnections, and ASR for storage and groundwater recharge. In the LWC Planning Area, over 80 percent of wastewater is beneficially reused.

Potential uses of reclaimed water include landscape irrigation (e.g., residential lots and golf courses), agricultural irrigation, groundwater recharge, industrial uses, environmental enhancement and fire protection.

IN THE LWC PLANNING AREA, ACCORDING TO THE 2004 REUSE INVENTORY, OVER 80 PERCENT OF WASTEWATER IS BENEFICIALLY REUSED.

Reclaimed water offers an environmentally sound means for managing wastewater that dramatically reduces environmental impacts associated with discharge of secondary treated effluent. In addition, use of reclaimed water provides an alternative water supply for many activities that do not require potable quality water, such as irrigation, which serves to conserve available supplies of potable quality water. Finally, some types of reclaimed water offer the ability to recharge and augment available water supplies with high quality reclaimed water.

In addition to costs for transmission and distribution system installation, reclaimed water capital costs typically include upgrading wastewater treatment facilities to advanced secondary treatment by adding filtration and high-level disinfection. Additional upgrades to "advanced wastewater treatment," which reduce nitrogen and phosphorous, may be needed if rehydration or wellfield recharge projects are contemplated. A generalized cost example for adding 5 MGD in high-level disinfection and filtration (i.e., conversion to advanced secondary treatment) at a wastewater treatment plant (WWTP) currently using secondary treatment is provided in **Table 5**. To ensure consistency with other comparative cost estimates in this chapter, it was presumed an additional 5 acres of property adjacent to the existing facility would be required (1 acre per MGD of capacity) for this installation. Assumptions relative to debt service are consistent with the other examples in this chapter. The costs shown do not include capital costs for installation, and operation and maintenance costs for reclaimed transmission and distribution pipelines, which would be significant. It must also be noted that these costs also do not reflect the capital investment, and operation and maintenance costs for the original secondary treatment wastewater treatment plant, as these costs would have been necessary regardless of whether or not the facility provides reclaimed water. A listing of reclaimed water facilities and capacities is provided in the Potable and Wastewater Treatment Facilities **Appendix E**.

Table 5. Estimated Project Costs for Upgrade from Secondary to Advanced Secondary Treatment.

Treatment	Total Capital	Capital $ per gallon of Capacity	Annual O & M	Unit Cost ($/1,000 gallons)
Addition of 5 MGD filtration and high-level disinfection to existing secondary treatment WWTP	$5,100,000	$1.02	$113,000	$0.30

Reclaimed Water System Interconnects

Reclaimed interconnects are connections between two or more reclaimed water distribution systems (which may be owned or operated by different utilities), or between two or more domestic wastewater treatment facilities that provide reclaimed water for reuse activities. Reclaimed water system interconnects offer a means to increase both the efficiency and reliability of reclaimed systems. When two or more reclaimed water systems are interconnected, additional system flexibility and reliability are often developed. For example:

- One system may be newer with fewer customers and be adjacent to a more mature system that could use additional reclaimed water to meet the needs of its customers.
- An interconnect between a mature reclaimed water system and a system that has no reclaimed water, or limited reclaimed water customers, can help avoid (or limit) the need for a supplemental groundwater or surface water supply to meet seasonal demands in the more mature system.
- If one reclaimed water facility experiences a temporary problem with supplying reclaimed water of acceptable quality, the interconnect with another facility can provide a means to enable continued delivery of reclaimed water to system customers, while the problem is resolved.
- Interconnects may offer the ability to share system storage facilities, which would increase flexibility, while maximizing use of existing storage facilities. As ASR becomes more common as a means for storing

reclaimed water, reuse system interconnects could provide opportunities for development of shared ASR systems as key components of regional reclaimed water programs.

As recommended in the *2000 Lower West Coast Water Supply Plan* (2000 LWC Plan), the District initiated the Regional Irrigation Distribution System (RIDS) Project. This project included feasibility studies to evaluate and support the interconnection of reclaimed water systems in the LWC Planning Area. The intent of the interconnections is to make reclaimed water available to a wider customer base, as well as improve opportunities for storage of reclaimed water and seasonally available surface water that might be used to supplement the reclaimed system. **Appendix G** provides more detailed information regarding the RIDS feasibility studies and project implementation.

DISTRICT

Reclaimed water is also emphasized in policy documents, such as the April 2002 *Florida Water Conservation Initiative* and the *2001 Florida Water Plan*. The Water Resources Implementation Rule (Chapter 62-40, Florida Administrative Code) as amended in 2005, requires the Florida Department of Environmental Protection (FDEP) and water management districts to advocate and direct the reuse of reclaimed water as an integral part of water management programs, rules and plans. The South Florida Water Management District (SFWMD or District) requires all applicants for water use permits to use reclaimed water unless the applicant can demonstrate it is not available or it is not technically and environmentally feasible to do so.

Additional guidance relating to the implementation of water reuse in Florida is given in the 2003 FDEP *Water Reuse for Florida - Strategies for Effective Use of Reclaimed Water* report. The following strategies, identified in the report, are the ones most directly related to the development of regional water supply plans:

- Encourage groundwater recharge and indirect potable reuse.
- Encourage metering and volume-based rate structures.
- Encourage use of reclaimed water in lieu of other water sources.
- Encourage use of supplemental water supplies.
- Facilitate seasonal reclaimed water storage.
- Encourage reuse system interconnects.
- Encourage integrated water education.
- Link reuse to regional water supply planning.
- Implement viable funding programs.

The report provides a road map for the State of Florida's Water Reuse Program into the 21st century. The *Water Reuse for Florida Report* (Reuse Coordinating Committee 2003) is available from the FDEP Web site: http://www.floridadep.org/water/reuse/techdocs.htm.

Nontraditional

Strategically located surface water storage (primarily storage in combination with improved stormwater management systems) could improve stormwater quality, recharge Surficial Aquifer wellfields, reduce the potential for saltwater intrusion and reduce wetland drawdowns. On-site storage in agricultural areas may reduce the need for water from other freshwater source options. Stormwater reservoirs could be located with ASR facilities and provide a water source for the facility.

CONSERVATION

Water conservation is regarded as an important component in integrated water resource management and vitally important for the LWC Planning Area. Measures to use water more efficiently can be less expensive than projects that increase supply. Other important advantages of conservation include reducing stress on natural systems. Water conservation projects are often easier to implement than supply projects due to less complex permitting, lower costs and acceptance by the public.

Increased use of reclaimed water and increased water conservation and research were recommended in the 2000 LWC Plan to meet the region's projected water demands and to reduce the potential for harm to wetlands and water resources. The various definitions of harm are provided in **Chapter 3**.

A Statewide Effort

In response to growing water demands, water supply problems and one of the worst droughts in Florida's history, the FDEP led a statewide Water Conservation Initiative to find ways to improve efficiency in all categories of water use. Hundreds of stakeholders participated in the initiative, which addressed all water use classes and subsequently offered alternatives to save water. Fifty-one cost-efficient alternatives were published in *The Florida Water Conservation Initiative* (FDEP 2002). These alternatives can be found in the *Consolidated Water Supply Plan Support Document* (SFWMD 2005–2006). The conservation methods best suited to the scope of the 2005–2006 LWC Plan Update are presented in **Appendix I**.

In addition to policy and regulatory measures, the following conservation measures were the highest ranked of the Water Conservation Initiative alternatives:

Agricultural Water Conservation

Agricultural irrigation accounts for one of the largest water uses in the LWC Planning Area. Improvements in the recovery and recycling of irrigation water and greater use of reclaimed water for irrigation have already resulted in significant water savings throughout the region.

Over 66 percent of the citrus acreage in the LWC Planning Area is now irrigated using low-volume technology or microirrigation, while the remaining acreage is irrigated by flood irrigation. Much of the acreage currently irrigated by flood irrigation is located in Chapter 298 Districts (Chapter 298, F.S.), where several growers use a method of rain harvesting, which recycles water after each use and moves it from one citrus grove to another. Conversion of citrus acreage from flood irrigation to microirrigation will continue to increase water savings. The U.S. Department of Agriculture–Natural Resources Conservation Service (USDA–NRCS) has promoted water conservation through conversion of flood irrigation systems to low-volume technology with its Environmental Quality Improvement Program (EQIP) cost-sharing program.

Urban Water Conservation

Landscape Irrigation

Landscape irrigation for watering lawns, ornamental plants and golf courses can be significantly reduced through more efficient irrigation system design, installation and operation, and by reducing the amount of landscape requiring intensive irrigation. Rain sensors can save an average of 27,000 gallons per year per home irrigation system. If 75 percent of homes in the LWC Planning Area were to install rain sensors, the region could annually save an estimated 9.9 MGD.

Indoor Water Use

Indoor water use accounts for a major portion of demands on public water supply. The greatest potential for conserving water in this sector is through increasing the number of Florida homes and businesses using water efficient toilets, clothes washers, showerheads, faucets and dishwashers. Plumbing retrofit programs were one of the Water Conservation Initiative's highest ranked alternatives and were recommended in the 2000 LWC Plan.

If 75 percent of homes built before 1984 were to retrofit at least one toilet and one showerhead, the LWC Planning Area could potentially achieve a total annual savings exceeding 12 MGD. Whenever indoor water use is reduced, there is also a reduction in wastewater. Achieving this savings is highly dependent on cooperating utilities, and several utilities have conducted small-scale retrofit projects.

The SFWMD will continue to devise programs for retrofits, provide Water Savings Incentive Program (WaterSIP) funding, technical assistance and outreach. The District's WaterSIP is tailored to assist the community to partially fund projects, such as large-scale retrofits, as recommended by this LWC Plan Update. Water pricing rate structures (including drought rates) and informative utility billing are effective techniques to encourage water users to conserve water. Each year the District sets parameters for WaterSIP proposals that stress water conservation options recommended in the regional water supply plans.

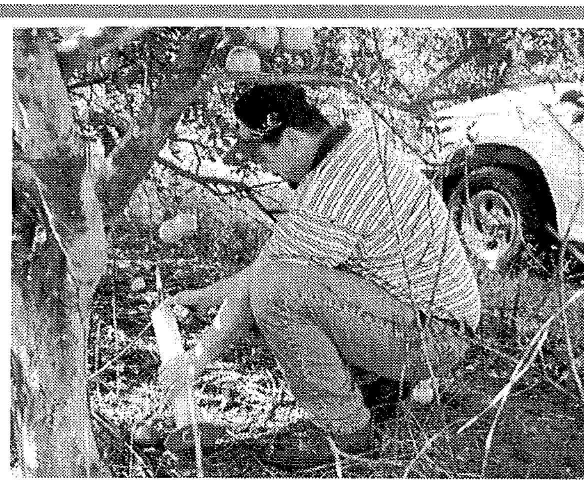
Industrial, Commercial and Institutional

Industrial, commercial and institutional users can improve water use efficiency through certification programs for businesses implementing industry-specific best management practices and through water use audits, improved equipment design and installation, and greater use of reclaimed water.

General Policy Considerations

Reuse of reclaimed water can be used more efficiently through pricing and metering. Metering of reclaimed water use and implementation of volume-based rates for reclaimed water is a major strategy contained in the *Water Reuse for Florida – Strategies for Effective Use of Reclaimed Water Report* (Reuse Coordinating Committee 2003) to promote efficient use of reclaimed water.

The role of education and outreach programs and the effect of cooperative funding programs, such as the Mobile Irrigation Lab (MIL) and other agricultural irrigation programs, were also reviewed to assess the potential for water conservation in the LWC Planning Area. Cooperative funding, cost-sharing, WaterSIP and other incentives to support cost-effective projects within all sectors of water use promoting increased efficiency have been effective.



Technician Collecting Discharge Volume from Microirrigation Spray Jet Emitter

The MIL Program began in south Florida in 1989 with an agricultural lab in the LWC Planning Area. The mission of the program is to educate and demonstrate to agricultural and urban water users how to irrigate efficiently. Currently, there are 15 operational labs in the SFWMD. Ten are District-funded and five are funded by other sources. Twelve counties are served by the labs Districtwide. Funding is provided by a multiagency partnership between federal, state, regional and local levels of government.

In addition to the agricultural lab, which provides evaluations in Collier, Lee, Hendry, Glades and Charlotte counties, two of the four urban labs in the LWC Planning Area are District-funded. The Collier County urban lab has been in operation since 2002, and the Lee County urban lab has been in operation since 1994.

In the past two years (2004 and 2005), recommendations for improvements to irrigation systems in the LWC Planning Area have yielded average potential water savings of 0.9 MGD (900,000 gallons per day). Districtwide, each urban MIL saves an average of 0.08 MGD (80,000 gallons per day) and each agricultural MIL saves an average of 0.41 MGD (410,000 gallons per day). Plans to start additional labs within the District's boundaries are under way.

More information on conservation efforts and plan recommendations for the LWC Planning Area can be found in **Appendix I**.

DISTRICT

Conserve Florida Program

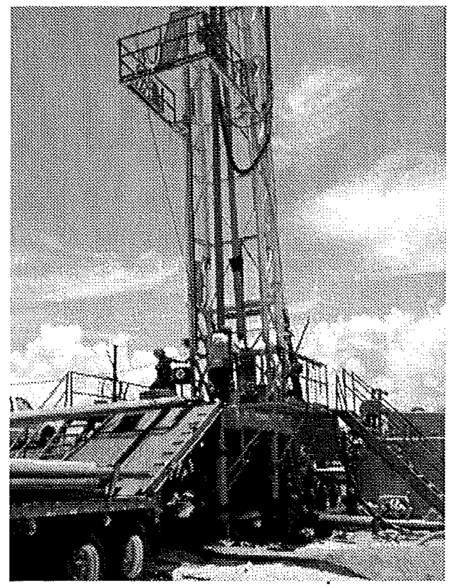
During finalization of this plan update, legislation was passed incorporating and codifying the development of the statewide Water Conservation Program for public water supply (Section 373.227, F.S.). The law provides goals that must be addressed as part of the program, called "Conserve Florida," which encourages conservation by utilities and stresses accountability.

As provided in Section 373.227(4), F.S., a water management district must approve a goal-based water conservation plan as part of a consumptive use permit if a utility provides reasonable assurance that the plan will achieve effective water conservation, at least as well as the water conservation requirements adopted by the appropriate water management district, and is otherwise consistent with the statute.

Also required by Florida House Bill 293, and included in the Conserve Florida Program, are guidelines that address Xeriscape™ landscaping and the development of a statewide model ordinance to increase landscape irrigation efficiency. In addition, the 2004 legislation allows water management districts to require the use of reclaimed water, if feasible, and to encourage metering of newly implemented reuse projects, enabling utilities to charge for the actual volume of water used. See Chapters 367, 373, 403, 570 of the Florida Statutes for specific legislative authority on the statewide Water Conservation Program.

SUMMARY

Rapid growth in the LWC Planning Area will add 197 MGD in new water demand by 2025. Demand will increase in all six major use categories with the largest increase in Public Water Supply. Additional supplies must be developed and conservation measures must be improved to meet future needs. Since the amount of additional freshwater supplies to meet 2025 demand is limited, development of new alternative supplies is essential. Viable alternative sources include brackish water, expansion of the reclaimed system and the capture of seasonally available surface water.



Aquifer Storage and Recovery Drill Rig

The addition of storage, most likely ASR, will be critical to expansion and maximum use of the reclaimed system, as well as augmentation of the system using wet-weather surface water flows. The expansion of storage also holds promise in providing new potable supply opportunities and potentially providing water that could be used to mitigate wetland impacts and improve freshwater wellfield yields.

ALTERNATIVE WATER SOURCE OPTIONS

Section 373.019, Florida Statutes (F.S.) provides:

"Alternative water supplies" means salt water; brackish surface and groundwater; surface water captured predominately during wet-weather flows; sources made available through the addition of new storage capacity for surface or groundwater; water that has been reclaimed after one or more public supply, municipal, industrial, commercial, or agricultural uses; the downstream augmentation of water bodies with reclaimed water; stormwater; and, any other water supply source that is designated as nontraditional for a water supply planning region in the applicable regional water supply plan.

BRACKISH WATER / SEAWATER Water containing significant amounts or concentrations of dissolved salts or total dissolved solids (TDS) that is treated for use as an alternative water source.

CAPTURED STORMWATER / SURFACE WATER Water captured predominantly during wet weather flow and stored aboveground or underground for future beneficial use.

RECLAIMED WATER Water that has received at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility.

OTHER Water from nontraditional sources identified in the water supply plans, or water from conveyance facilities or operable structures for water supply.

6

Water Resource Development Projects

Florida water law identifies two types of projects to meet water needs: Water Resource Development projects and Water Supply Development projects. Water Resource Development projects are generally the responsibility of a water management district, and are intended to assure the availability of an adequate supply of water for all competing uses deemed reasonable and beneficial, and to maintain the functions of natural systems. Water Supply Development projects are generally the responsibility of local users, such as utilities, and involve the water source development options described in **Chapter 5** to provide water to users.

> **LAW / CODE**
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> Water resource development is defined in Section 373.019(22), Florida Statutes (F.S.), as the formulation and implementation of regional water resource management strategies, including the collection and evaluation of surface water and groundwater data; structural and nonstructural programs to protect and manage water resources; the development of regional water resource implementation programs; the construction, operation and maintenance of major public works facilities to provide for flood control, surface and underground water storage, and groundwater recharge augmentation; and related technical assistance to local governments and to government-owned and privately owned water utilities.

This chapter addresses the role of the South Florida Water Management District (SFWMD or District) and other parties in Water Resource Development projects, and provides a summary of the Water Resource Development projects in the Lower West Coast (LWC) Planning Area, including schedules and costs for Fiscal Years 2006–2010. Water Supply Development projects are addressed in **Chapter 7**.

Water Resource Development projects support and enhance Water Supply Development projects, but often by themselves do not yield specific quantities of water. For example, hydrologic investigations and groundwater monitoring and modeling provide important information on aquifer characteristics, such as hydraulic properties and water quality. All of these efforts are useful in developing an appropriate facility design, identifying the safe yield and evaluating the economic viability of Water Supply Development projects. The Water Resource Development projects described in this chapter—drilling and testing, groundwater and wetland monitoring, groundwater and evapotranspiration assessments, Districtwide feasibility studies, minimum flows and levels, and reservations—do not produce water, but serve an important role in supporting the Water Supply Development projects described in the next chapter. The Water Conservation Program, which makes water available, is discussed in this chapter, and encourages measures to use water more efficiently so the water saved can be used to meet new needs. In effect, conservation expands current water supplies.

The following water resource efforts are organized according to the current budget categories the District uses for funding both new and ongoing Water Resource Development projects. The status of these projects and identification of implementing entities are included in project discussions.

Table 6 at the end of the chapter summarizes the estimated costs and time frames for completion of these projects. The District's Water Resource Development projects presented in this chapter encompass more than one region and are therefore considered Districtwide. Aspects of these Districtwide projects specifically pertaining to the LWC Planning Area are identified.

DRILLING AND TESTING PROGRAM

A Districtwide Drilling and Testing Program is providing an improved understanding of the geology and hydrology of the aquifers in south Florida as new exploratory/test wells are constructed during the next five years. Efforts will continue to evaluate conditions in the Floridan Aquifer System (FAS) as a brackish water supply source for the LWC Planning Area, and well construction activities at each site are yielding additional information on the aquifers and confining units above the FAS. These efforts will develop a more complete understanding of the hydrology and potential yields of the aquifer system, as well as support consumptive use permitting (CUP) and water supply development efforts.

GROUNDWATER AND WETLAND MONITORING

Well construction and monitoring efforts provide information on geology, aquifer characteristics and water level conditions to aid the SFWMD in the development of groundwater models, assessing groundwater conditions and management of this resource. Aquifer monitoring is an ongoing effort.

Groundwater Monitoring

Groundwater level and water quality monitoring in the LWC Planning Area was expanded between 2000 and 2005. Ongoing monitoring efforts continued in the

Surficial Aquifer System (SAS) and Intermediate Aquifer System (IAS), and an additional 23 recorders were installed on SAS wells in Hendry County to evaluate local water level trends. The FAS network was expanded to 12 sites within the LWC Planning Area. Continuous water-level recorders have been installed at these sites, and periodic water quality assessments are available.

Wetlands Monitoring Network

Wetlands serve a vital role in providing habitat for many species of plants and animals. Within the SFWMD, consumptive uses, drainage or other diversions of water may impact the hydrologic system supporting these wetlands. To better understand these systems, the District has expanded its network of wetland monitoring sites Districtwide.

GROUNDWATER AND EVAPOTRANSPIRATION ASSESSMENTS

A number of specialized hydrogeologic studies were completed by the U.S. Geological Survey (USGS) in cooperation with the District. The information learned from these studies is needed to enhance the understanding of aquifers and evapotranspiration (ET) rates across the District. Typically, each project requires several years of focused effort by the USGS professionals, giving a continuity and focus unique to the USGS. Some projects have the cooperation of other water management districts or other governmental agencies. The USGS reports, maps and data are peer reviewed and highly respected in the industry, making them invaluable references for District groundwater models, assessments and policy-making.

Current USGS projects include development of a water quality module for a new District model and a project to measure ET in five specific vegetation communities that occur throughout the District. In addition, a study of the salinity patterns and sediment runoff in Estero Bay is being conducted in the LWC Planning Area.

COMPREHENSIVE WATER CONSERVATION PROGRAM

The SFWMD's overall water conservation goal is to prevent and reduce wasteful, uneconomical, impractical or unreasonable uses of water resources. In addition to improving efficiency of water use, the statewide Water Conservation Program, known as "Conserve Florida," strives to improve management of traditional supplies and encourage development of alternative or diverse water supply sources. To better promote the conservation goal, the SFWMD funds outreach and educational programs to encourage water users to make efficient use of water resources through conservation and reuse.

Through the Water Savings Incentive Program (WaterSIP), the SFWMD provides matching funds up to $50,000 to water providers, such as utilities and homeowners associations, for water-saving technologies. These technologies include low-flow plumbing fixtures, rain sensors, fire hydrant flushing devices and other hardware. During Fiscal Years 2002–2006, 41 projects were funded Districtwide and cumulatively made 2.5 MGD of water available. For Fiscal Year 2007, 14 projects are proposed for funding and are anticipated to make 0.9 MGD (900,000 gallons per day) of water available. Based on the actual and proposed water savings for Fiscal Years 2002–2007, it is anticipated that a cumulative total of 3.4 MGD of water will be made available Districtwide. Since the program's inception in 2002 through 2011, it is estimated that 4.25 MGD of water will be made available by WaterSIP.


Mobile Irrigation Lab Program

The Mobile Irrigation Laboratory (MIL) Program consists of specialized labs on wheels designed to conduct irrigation audits of agricultural and urban irrigation systems. The MILs are operated by the Soil and Water Conservation Districts and provide recommendations to water users who implement the water savings recommendations. It is anticipated the MIL Program will make a cumulative total of 10 MGD available Districtwide between Fiscal Years 2007–2011. Since the program's inception in 1989 through 2006, it is estimated that 106 MGD of water has been made available by the MIL program.

Districtwide, there are 15 MILs serving 12 counties. Ten MILs are District-funded and five are funded by other sources. In the LWC Planning Area, there are five MILs, three of which are funded by the District. These include an urban lab in Collier County, an urban lab in Lee County, and an agricultural lab that provides evaluations in Collier, Lee, Hendry, Glades and Charlotte counties. See **Appendix I**: Conservation for more information about the MIL Program in the LWC Planning Area.

Rulemaking efforts are under way at the SFWMD to consider goal-based conservation as a permit condition. Workshops are being held concerning revisions to Chapter 40E-2, Florida Administrative Code (F.A.C.), and the *Basis of Review for Water Use Permit Applications* (SFWMD 2003) that would require individual water utilities to develop goal-based conservation programs. Goal-based conservation allows utilities to achieve a water management district agreed-upon conservation goal, such as a reduction in per capita or overall reduction in pumpage, using any method from a suite of methods the utility chooses, to satisfy CUP conservation requirements.

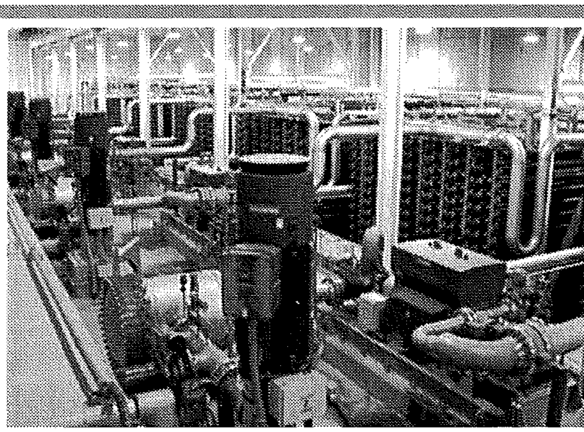
FEASIBILITY STUDIES

The SFWMD is performing feasibility studies to determine the viability of water resource development options in order to increase water supply through water resource alternatives. This effort involves collecting and analyzing data and modeling.

Water User and Supply Cost Relationships Feasibility Study

The objective of the Water User and Supply Cost Relationships Project is to develop engineering cost estimation relationships for evaluating water supply alternatives for the SFWMD's four planning regions. This effort will include options using groundwater, surface water, seawater, aquifer storage and recovery (ASR), and reclaimed water for reuse.

Co-Located Desalination Feasibility Study


Desalination Plant

As discussed in **Chapter 5**, saltwater desalination is a potential alternative source meriting future consideration. Seawater has been identified as a significant drought-proof and available resource. Recommended technologies for use or further study in the treatment of brackish water or seawater include reverse osmosis (RO). Advances in membrane technologies have substantially reduced the cost of RO treatment, creating recent interest in the implementation of RO in the coastal United States, including Florida, Texas and California. The 25-MGD Tampa Bay Water RO plant, co-located with the Tampa Electric Company's Big Bend

Power Plant, is expected to start producing water by December 2006. In California, the City of San Diego is implementing a 50-MGD co-located seawater RO facility in Carlsbad, based on the results of its successful demonstration project.

To demonstrate the feasibility of coastal water desalination and the benefits of co-locating large desalination plants with existing power plants in south Florida, the current study builds on the results obtained from the 2002 Desalination Feasibility Study. The study area will be streamlined to a small number of site-specific demonstration projects throughout the District, and final site selection will be based on the availability of willing partners, future water demand, and technical, regulatory and economic criteria. The study, which will be completed in October 2006, is expected to recommend specific demonstration projects and provide conceptual designs.

MODELING

The SFWMD funds modeling efforts supporting the establishment of minimum flows and levels (MFLs), water reservations and projects in the District's four regional planning areas.

Modeling for Minimum Flows and Levels

Minimum flows and levels are being developed pursuant to the requirements contained within the *Water Resources Act* and Sections 373.042 and 373.0421, Florida Statutes (F.S.), as part of a comprehensive water resources management approach to assure the sustainability of south Florida's water resources. As part of the MFL process, the SFWMD develops models to assist in determining the hydrologic relationships between MFL criteria and the water resources that need to be protected from significant harm.

Modeling for Regional Irrigation Distribution System (RIDS)

A recommendation of the *2000 Lower West Coast Water Supply Plan* (2000 LWC Plan) included conducting a feasibility and design study for a regional irrigation water distribution system (RIDS) to help meet the growing urban irrigation demands of the LWC Planning Area. Reclaimed water was to be used where available to serve the irrigation distribution systems. The RIDS Study was completed in 2004, and implementation began in 2005 with the District providing $500,000.

The RIDS Project is now funded through the SFWMD's Alternative Water Supply Program, and projects are managed by local governments and utilities.

The District's role is analysis, oversight and intergovernmental coordination, which potentially includes modeling efforts. The expected completion of RIDS is 2020. **Appendix G** provides more detailed information on the analyses and implementation of RIDS.

Surficial, Intermediate and Floridan Aquifer Model Development

In 2001, based on the recommendations in the 2000 LWC Plan, the District began development of regional groundwater models for the SAS, IAS and FAS in the LWC Planning Area. This ongoing effort involves the implementation of two new groundwater models: one for the SAS, including the water table, Lower Tamiami and Sandstone aquifers, and another for the IAS and FAS. Both models include finer grid resolution than previous regional efforts and the most current geologic, hydrologic and pumping data.

The SAS Model is a groundwater flow model developed using the USGS MODFLOW Program. The SAS Model implementation is being conducted by a private engineering firm under contract to the District. The FAS modeling is being conducted using the SEAWAT Program, which simulates variable density flow and transport conditions. The FAS Model is a joint effort between the District and Florida Atlantic University.

Due to time constraints imposed upon the water supply plan schedules from the adoption of state growth-management legislation in late 2005, the modeling efforts are on a parallel, but separate path from the production of the five-year update for the LWC Plan. The following model items will be completed after the update of the LWC Plan: calibration, documentation of the models and peer review.

MINIMUM FLOWS AND LEVELS ACTIVITIES

As part of the process of establishing and maintaining MFLs, the SFWMD is developing and implementing an electronic tracking system to determine whether MFL criteria are being met. Other efforts include producing documents and conducting scientific and peer reviews.

RESERVATIONS ACTIVITIES

The process of establishing water reservations for resource protection involves preparing documents, conducting scientific peer reviews, holding public workshops and providing administrative support. In some cases, the District assembles a team of experts to assist with analysis, interpretation, and presentation of technical issues and information needed to develop and implement a standardized methodology/approach for water reservations.

OTHER EFFORTS

Other efforts may be funded by District departments other than Water Supply and could include cofunding by local, state and federal agencies. Several efforts initially cited in the 2000 LWC Plan now fall under the auspices of the Comprehensive Everglades Restoration Plan (CERP) and Acceler8. These projects are discussed in **Chapter 3**.

SUMMARY

Water Resource Development projects serve various purposes in support of water supply development. The beneficial outcomes of the resource development projects discussed in this chapter include:

- Improved understanding of the hydrologic system that is the source of both traditional and alternative water supplies for the LWC Planning Area.
- Prevention of loss of natural resources.
- Preservation of existing supplies through better resource understanding, and management and implementation of regional resource improvement programs.
- Avoidance of potentially greater future expenditures associated with additional restoration of environmental degradation.
- Cost savings, including those savings associated with appropriate supply facilities design and use of existing resources.
- Increased future supply availability through testing or program implementation.

Table 6. Implementation Schedule and Costs for Districtwide Water Resource Development Projects Fiscal Years 2006-2010.

Project	Plan Implementation Schedule and Costs ($1,000s)					
	FY06 $	FY07 $	FY08 $	FY09 $	FY10 $	Total $
Drilling and Testing Est. start date: 1990 Est. finish date: ongoing	1,736	109	115	121	127	2,208
Groundwater and Wetland Monitoring Est. start date: 2002 Est. finish date: ongoing	810	581	610	640	627	3,268
Groundwater and ET Assessments Est. start date: 1954 and 2002, respectively Est. finish date: ongoing	385	270	284	298	313	1,550
Water Conservation Program Est. start date: 1977/2000 Est. finish date: ongoing	1,650	1,248	1,248	1,248	1,248	6,642
Districtwide Feasibility Studies Est. start date: 2001 Est. finish date: ongoing	950	550	600	600	600	3,300
Modeling Est. start date: 1998 Est. finish date: ongoing	100	195	205	215	226	941
MFLs Activities Est. start date: 1995 Est. finish date: ongoing	105	160	200	200	200	865
Reservations Activities Est. start date: 2004 Est. finish date: ongoing	425	195	200	200	200	1,220
Total	$6,161	$3,308	$3,462	$3,522	$3,541	$19,994

LAW / CODE

Section 373.196(3), Florida Statutes (F.S.), provides:

The primary roles of the water management districts in water resource development as it relates to supporting alternative water supply development are:

(a) The formulation and implementation of regional water resource management strategies that support alternative water supply development;

(b) The collection and evaluation of surface water and groundwater data to be used for a planning level assessment of the feasibility of alternative water supply development projects;

(c) The construction, operation, and maintenance of major public works facilities for flood control, surface and underground water storage, and groundwater recharge augmentation to support alternative water supply development;

(d) Planning for alternative water supply development as provided in regional water supply plans in coordination with local governments, regional water supply authorities, multijurisdictional water supply entities, special districts, and publicly owned and privately owned water utilities and self-suppliers;

(e) The formulation and implementation of structural and nonstructural programs to protect and manage water resources in support of alternative water supply projects; and

(f) The provision of technical and financial assistance to local governments and publicly owned and privately owned water utilities for alternative water supply projects.

7

Water Supply Development Projects

The population in the Lower West Coast (LWC) Planning Area is expected to increase by about 74 percent, growing to about 1.6 million by 2025. Net water demand for all users is projected to increase by approximately 197 million gallons per day (MGD) between 2005 and 2025 to 821 MGD. Water to serve increased future urban demand is expected to be developed primarily from alternative water supplies, including brackish groundwater resources, surface water captured during wet weather and expansion of reclaimed water systems. Agriculture, the largest water user in the LWC Planning Area, must continue to improve irrigation practices to conserve water and, where feasible, use alternative supplies, such as blended sources and tailwater/stormwater recovery systems.

WATER TO SERVE INCREASED FUTURE URBAN DEMAND IS EXPECTED TO BE DEVELOPED PRIMARILY FROM ALTERNATIVE WATER SUPPLIES, ...

This chapter provides a summary of the Water Supply Development projects anticipated to meet the needs of the LWC Planning Area for the next 20 years. Information is provided for each water use category, with a particular emphasis on the fast-growing Public Water Supply sector. Additional details about individual users, projects, quantities developed and project costs can be found in **Appendices A**, **B** and **D**.

LAW / CODE

Water supply development is defined in Section 373.019(24), Florida Statutes (F.S.), as the planning, design, construction, operation and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale or end use.

Local governments, government-owned and privately owned utilities, regional water supply authorities, multijurisdictional water supply entities, self-suppliers, and other water users are primarily responsible for Water Supply Development projects.

Water Supply Development projects selected for inclusion in this *2005–2006 Lower West Coast Water Supply Plan Update* (2005–2006 LWC Plan Update) primarily include alternative water supplies. As part of the planning process in preparing this plan update, the South Florida Water Management District (SFWMD or District) circulated a questionnaire to solicit information from municipal, agricultural and other water suppliers regarding the traditional and alternative water supply projects planned to meet their needs for the next 20 years. This process allowed local governments, water suppliers and water users to provide input on the proposed water supply projects included in the plan update.

Not all projects presented in the questionnaires are included in this plan update. Several factors were evaluated to determine a project's inclusion in the plan update, such as resource constraints, and whether a project actually contributes new water supply. Many projects submitted reflect such practices as maintenance of existing facilities and improvements in the distribution system. While these projects reflect good utility practice, they do not represent alternative water supply projects.

Furthermore, a project identified for inclusion in this plan update may not necessarily be selected for development by the utility. In accordance with Section 373.0361(6), Florida Statutes (F.S.), nothing contained in the water supply component of a regional water supply plan should be construed to require local governments, public or privately owned utilities, special districts, self-suppliers, multijurisdictional entities and other water suppliers to select that identified project. If the projects identified in this plan update are not selected by a utility, the utility will need to identify another method to meet its needs and advise the District of the alternate project(s), and a local government will need to include such information in its 10-Year Water Supply Facilities Work Plan.

Alternative water supply projects listed in this 2005–2006 LWC Plan Update include alternative water supply projects submitted by local suppliers specifically for consideration in this plan update; projects submitted and approved for cost-sharing funds from the District (and the Big Cypress Basin) in Fiscal Year 2006 under the alternative water supply portion of the new Water Protection and Sustainability Program; and, projects recommended by the District for utilities that showed an unmet future need. Thirty-five of the Fiscal Year 2006 alternative water supply projects were in the LWC Planning Area and received over $11.2 million in District allocated cost-share funding, and $5.8 million in Big Cypress Basin allocated funding. These funds are for construction of alternative water supply projects, and applicants must pay at least 60 percent of a project's construction costs.

The fact that an alternative water supply project has been included in this LWC Plan Update makes that project eligible for funding consideration, but does not guarantee District funding of that project. Inclusion in the plan update does not serve by itself as an application for funding. The alternative water supply funding requires completion and submittal (by the project owner) of a separate application for each project for which funding is requested on an annual basis.

The application for alternative water supply funding, as well as submittal time frames and requirements are available from the District's Web site at http://www.sfwmd.gov/watersupply. Detailed information about all projects can be found in **Appendix A**.

Demand and supply conditions for the six major water use categories are evaluated in this chapter. Because the majority of growth in demand during the next 20 years will occur in the urban sector, and more specifically within the public water systems, particular emphasis is placed on evaluating future needs and recommending water supply projects within the Public Water Supply category.

PUBLIC WATER SUPPLY

Public Water Supply (PWS) includes all potable uses served by municipal and private utilities. Public Water Supply demand is projected to grow from the current 128 MGD to 225 MGD in 2025. Public water demand is currently met through a combination of traditional groundwater and fresh surface water supplies, as well as alternative supplies, such as brackish groundwater.

Table 7 shows the comparison between projected Public Water Supply demand and future supply for each county in the LWC Planning Area for Year 2025. Regionwide, **Table 7** shows a surplus 2025 supply condition of about 99 MGD. Countywide information shows a range of surplus supply conditions. Utility summaries providing individual service area data are included later in this chapter. On a countywide basis, the largest projected surpluses occur in Lee and Collier counties, which account for about 98 percent of the Public Water Supply demands in the LWC Planning Area. **Chapter 2** and **Appendix D** provide additional details on the Public Water Supply demand and supply conditions.

The projected supplies in **Table 7** are based on existing permitted supplies; alternative water supply potable water projects submitted and approved for the District's 2006 alternative water supply funding; eligible potable water projects submitted by local water suppliers specifically for the 2005–2006 LWC Plan Update; and, District-recommended projects for those entities that did not supply project information and showed an unmet future need.

Table 7. Public Water Supply Demand and Supply Projections for 2025.

County	PWS Demand (MGD)	Projected Supplies (MGD)[a]	Projected Surplus or Deficit (MGD)
Charlotte[b]	0.0	0.0	0.0
Collier	109.3	147.0	37.7
Glades[c]	0.5	0.7	0.2
Hendry[c]	4.9	19.8	14.9
Lee[b]	110.7	156.7	46.0
Monroe[d]	0.0	0.0	0.0
Total	225.4	324.2	98.8

a. Projected supplies include only potable water in Public Water Supply systems. Projected finished water yields from only those PWS projects that have been included in the utility summaries later in this chapter are shown. Areas served by Domestic Self-Supply shown as "zero" values.

b. State BEBR projections did not capture proposed development at Babcock Ranch in Charlotte and Lee counties. Proposed development of this 17,800 acres and associated water supply lacked data and sufficient analysis to support inclusion of projects in this plan update.

c. Counties have projected growth beyond that projected by BEBR, but have not sought FDCA approval for an exception to the use of BEBR projections. Such exception data will be considered by the District when available.

d. No development expected in the mainland portion of Monroe County.

Traditional public water supplies in the LWC Planning Area have included fresh groundwater from the Surficial and Intermediate aquifer systems and fresh surface water, primarily from the Caloosahatchee River. Approximately 60 percent of the region's current public water demand is met using traditional supplies. Existing demand and environmental constraints will continue to limit development of new traditional supplies sufficient to meet the increasing water demand in the planning area. Although some new traditional supply development may be practicable given appropriate local conditions, reductions in historical water use and opportunities for addressing adverse impacts, the availability and permittability of new traditional supplies to meet projected demands through 2025 have not been demonstrated. As such, the yield from most proposed new traditional supply projects has not generally been included in this plan update as a component of supply available to meet future demand.

The decision not to include most new traditional supply development projects in the plan update should not be interpreted as precluding development of these sources so long as that development is done in compliance with the District rules. In fact, some traditional freshwater projects have been included in this plan update. These projects reflect expansion of small systems currently relying on fresh groundwater to meet their needs. Inclusion of these freshwater projects in the plan update does not confer any special permitting status or relieve the permit applicant for such systems from meeting all District rule criteria in order to qualify for a permit.

The availability of new supply from the freshwater aquifers in the LWC Planning Area is limited due to resource issues, including wetland protection, saltwater intrusion and aquifer protection criteria. Land use changes anticipated in the region include the reduction in agricultural acreage in Collier and Lee counties, but increased agricultural acreage in Hendry and Glades counties. These changes, especially the reduction in agricultural lands in Lee and Collier counties, may create opportunities for other water users to seek new freshwater allocations. Such opportunities should be addressed on a case-by-case basis due to the site-specific variations that occur in aquifer confining units and other factors.

Operational differences between use types (such as Agricultural and Public Water Supply) may play a major role in determining the availability of water for allocation. Existing agricultural uses are generally seasonal, retain water on-site, and frequently use flood irrigation systems, which tend to raise the water table. On the other hand, most urban uses, including Public Water Supply, are year-round and distribute the water for use in remote locations. Such uses do not result in recharge of groundwater in the immediate area of the wellfield and are prone to have greater resource impacts in the immediate area.

Thus, careful analysis will continue to be required in this rapidly growing region when considering proposals for new water uses to ensure the resource protection criteria can be met by the new use.

Combining the projects submitted for the LWC Plan Update, the 2006 projects in the LWC Planning Area that received funding, and the projects developed by the District, a total of 153 water supply projects were evaluated as part of this plan update development.

Fourteen traditional supply projects were evaluated, including 11 submitted by local utilities and three projects developed by the District to support an unmet future need by small local utilities. In total, if all of these projects were permittable and developed as proposed, they represent about 25 MGD in new supply capacity.

One hundred seventeen alternative water supply projects were evaluated in this process. The alternative sources these projects propose to use include the following:

- Brackish Water: 41 projects yielding a potential 231 MGD (finished water).
- Reclaimed Water: 55 projects with a total constructed capacity of 307 MGD.

- Aquifer Storage and Recovery (ASR): 13 projects with a total dry-season capacity of 32 MGD.
- Surface Water: 8 projects with a total design capacity of 42 MGD.

Water conservation is a critical part of the District's efforts to protect and preserve the region's water resources. Although individual water conservation projects are not included in this chapter, the District's Water Conservation Program and local components are discussed in **Chapter 5**. The SFWMD's programs include an annual funding initiative for water conservation efforts.

Other types of water supply projects submitted for consideration in this LWC Plan Update include monitoring systems, wastewater disposal wells and distribution system improvements, such as potable water interconnections between local governments, finished water storage tanks, pipelines, booster stations, pump upgrades and backup power supplies. While these types of projects are appropriate for utility management and maintenance, they do not generate new water supply and were not included in this plan update.

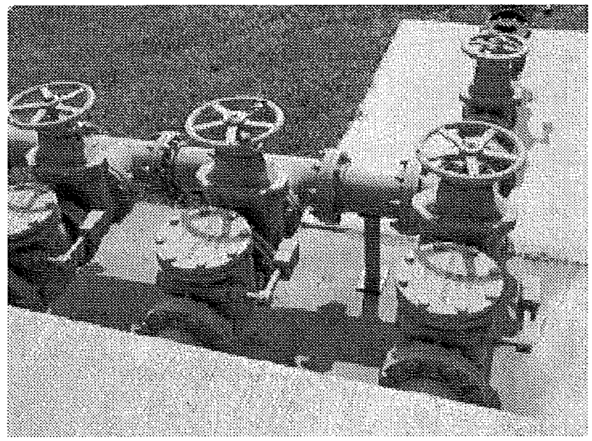
Individual summary pages are provided herein that identify demand and supply projections for the major utilities in the LWC Planning Area. Yield from existing supplies and new alternative water supply projects is compared with projected water demand for each service area in Years 2015 and 2025. Reclaimed and other nonpotable alternative water supply projects are shown, but not counted toward meeting future potable demand. The reuse of reclaimed water is widespread in the LWC Planning Area, and 55 additional projects have been proposed by major utilities to expand their systems during the next 20 years. The benefits of different reuse applications vary not only in terms of the project, but also in terms of location. For example, installing and mandating hook-ups to a reuse irrigation system in an area using treated drinking water from a municipal utility will lower the utility's per capita consumption and allow the utility to serve more customers with the same volume of potable water.

On the other hand, supplying reclaimed water to self-supplied operations, such as golf courses or other large users, can reduce competition for limited freshwater resources, but does not result in a reduction in demand on the potable water system. The replacement of a self-supplied withdrawal with reuse will not necessarily result in an additional freshwater allocation for the utility.

Other reuse projects, such as wetland or canal recharge, can be designed to support additional allocations by offsetting resource impacts that might preclude permitting of additional wells.

The SFWMD strongly supports reuse projects, and recognizes reuse applications have multiple benefits for the implementing utility. At the planning level, however, it is difficult to predetermine the potential offset without defining and analyzing the distribution of the reuse. Such offsets will be quantified on a case-by-case basis in the consumptive use permitting process based on the reclaimed water plans developed by the provider.

In the LWC Planning Area, 15 utilities had adequate supplies to meet future demand considering the combination of projects they submitted and existing supplies. Seven utilities in the planning area showed an unmet need in future supply and did not submit projects appropriate for consideration in the plan. In the case of unmet needs, the District has recommended projects for the local utilities to be included in the 2005–2006 LWC Plan Update.



Reclaimed Water Treatment Facility

UTILITY SUMMARY

CHARLOTTE COUNTY

Supply Entity: Charlotte County Utilities

Service Area: Charlotte County

Population and Supply Summary:
Proposed supply projects by 2015: Adequate
Proposed supply projects by 2025: Adequate

Water supplies in this area of Charlotte County are all Domestic Self-Supply, composed of traditional fresh groundwater. Future supplies shown for the area are also projected to be Domestic Self-Supply. The county has proposed development of a 40-MGD brackish supply on the Babcock Ranch to meet demand in its service area, but outside of the SFWMD. Projects that supply water outside of the SFWMD have not been included in the plan update and are not eligible for SFWMD funding. A proposed 17,800-acre development on the Babcock Ranch has not been considered in these projections.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population[a]	6,163	7,525	8,673
Per Capita (gallons per day finished water)	127	127	127
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	0.8	1.0	1.1
Volume from Traditional Sources[b]	0.0	0.0	0.0
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.0	0.0	0.0
Additional Potable Water Needed	0.0	0.0	0.0

a. Population within the portion of Charlotte County inside of the SFWMD.
b. All current and projected supply in this portion of the county is Domestic Self-Supply.

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	N/A
Alternative[a]			$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.0	0.0	
Other	0.0	0.0	
Total	0.0	0.0	$0.0

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

COLLIER COUNTY

Supply Entity: Ave Maria Utilities

Service Area: Ave Maria

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Ave Maria Utilities has a current permit for 1.3 MGD and proposes future water supplies from fresh groundwater. Proposals for increased withdrawals for fresh groundwater have generally not been included in this plan update due to uncertainties about resource issues. Exclusion of new freshwater proposals from this plan update does not limit or influence the permittability of these supply projects. Supporting studies will be needed to determine availability of traditional sources, which are limited by resources and other constraints. Due to the uncertainty of availability of the resource, the SFWMD recommends a brackish water supply project to meet future needs for this development.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	0	17,142	30,200
Per Capita (gallons per day finished water)	109	109	109
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	0.0	1.9	3.3
Volume from Traditional Sources	1.3	1.3	1.3
Volume from Alternative Sources	0.0	2.0	4.0
Reclaimed Capacity Available	0.0	2.3	4.7
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional[a]	0.0	0.0	N/A
Alternative			$20.6
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water[b]	2.0	4.0	
Seawater	0.0	0.0	
Reclaimed Water	2.3	4.7	
Other	0.0	0.0	
Total	4.3	8.7	20.6

a. Traditional project not shown included expansion of membrane softening plant and installation of additional Lower Tamiami production well capacity.

b. SFWMD proposed brackish water supply project totals 4 MGD RO capacity, six new production wells.

UTILITY SUMMARY

COLLIER COUNTY

Supply Entity: Collier County Public Utility Department

Service Area: Portions of Unincorporated Collier County

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Water supplies are currently about 50 percent traditional fresh groundwater and 50 percent alternative water supplies. The county proposal to develop approximately 15 MGD in new traditional project capacity by 2025 has not been included here. Exclusion of freshwater projects from this plan update does not limit or influence the permittability of these supply projects. Supporting studies will be needed to determine availability of traditional sources, which are limited by resources and other constraints.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	155,739	243,426	342,711
Per Capita (gallons per day finished water)	185	185	185
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	29.5	45.0	63.4
Volume from Traditional Sources	17.1	17.1	17.1
Volume from Alternative Sources	16.0	40.0	74.0
Reclaimed Capacity Available	21.6	33.5	50.8
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional[a]	0.0	0.0	$0.0
Alternative			$580.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	24.0	58.0	
Seawater	0.0	0.0	
Reclaimed Water[b]	11.9	29.2	
Other (finished water ASR)[c]	9.0	9.0	
Total	44.9	96.2	$580.0

a. Freshwater quantities associated with five projects submitted by the county not included.
b. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.
c. Finished water ASR capacity is a seasonal capacity. Quantity not included in Population & Supply Summary table above.

UTILITY SUMMARY

COLLIER COUNTY

Supply Entity: U.S. Water Corporation

Service Area: Everglades City

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Water supplies are currently 100 percent traditional fresh groundwater. U.S. Water Corp. operates and maintains the water and wastewater facilities under a contract with the city. Since no projects were submitted by the city or U.S. Water for the LWC Plan Update, the project listed below reflects a SFWMD-proposed project for the city to meet future water demand. Although the project contemplates fresh groundwater development, site-specific conditions evaluated during the permitting process will determine actual resource availability. The city should contemplate a back-up plan for supply, including additional conservation and alternative water supply development, in the event that local conditions do not support the project below.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	1,367	1,767	2,219
Per Capita (gallons per day finished water)	315	315	315
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	0.4	0.6	0.7
Volume from Traditional Sources	0.3	1.0	1.0
Volume from Alternative Sources	0.0	0.0	0.0
Reclaimed Capacity Available	0.1	0.1	0.1
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.7	0.7	$0.9
Alternative[a]			$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.0	0.0	
Other	0.0	0.0	
Total	0.7	0.7	$0.9

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

COLLIER COUNTY

Supply Entity: Florida Governmental Utility Authority (FGUA)

Service Area: Golden Gate

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Water supplies are currently 100 percent traditional fresh groundwater. A supply deficit condition is projected between 2011 and 2015. The FGUA did not provide any projects for the LWC Plan Update. The project listed below reflects a SFWMD-recommended project for FGUA to meet future demand. Although the project contemplates fresh groundwater development, site-specific conditions evaluated during the permitting process will determine actual resource availability. The FGUA should contemplate a back-up plan for supply, including additional conservation and alternative water supply development, in the event that local conditions do not support the project below.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	14,001	16,723	19,805
Per Capita (gallons per day finished water)	105	105	105
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	1.5	1.8	2.1
Volume from Traditional Sources	1.7	2.9	2.9
Volume from Alternative Sources	0.0	0.0	0.0
Reclaimed Capacity Available	0.9	0.9	0.9
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional[a]	1.2	1.2	$3.9
Alternative			$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water	0.0	0.0	
Other	0.0	0.0	
Total	1.2	1.2	$3.9

a. Project includes 1.2 MGD WTP increase, 0.2 MGD increase in permitted ADF and 0.5 MGD increase in permitted peak withdrawals.

UTILITY SUMMARY

COLLIER COUNTY

Supply Entity: Immokalee Water and Sewer District

Service Area: City of Immokalee

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies are composed of 100 percent traditional groundwater. A supply deficit condition is projected beginning in the 2006 to 2010 time frame. Since the Immokalee Water and Sewer District has not submitted any projects to address future demand increases, the project listed below represents a SFWMD-proposed project for the Immokalee Water and Sewer District to meet future demands.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	22,572	31,637	41,901
Per Capita (gallons per day finished water)	143	143	143
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	3.2	4.5	6.0
Volume from Traditional Sources	3.3	3.3	3.3
Volume from Alternative Sources	0.0	3.0	4.5
Reclaimed Capacity Available	2.5	2.5	2.5
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	Gross Capacity (MGD) 2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	$0.0
Alternative[a]			$22.8
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	3.0	4.5	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.0	0.0	
Other	0.0	0.0	
Total	3.0	4.5	$22.8

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

COLLIER COUNTY

Supply Entity: City of Marco Island Public Works Department

Service Area: City of Marco Island

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies are composed of about 60 percent traditional fresh surface water and 40 percent alternative water supplies. The majority of new potable supplies for Marco Island rely on harvest of wet season supply from Marco Lakes/Henderson Creek with ASR storage, and installation of new treatment capacity on the island.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	16,121	17,741	19,576
Per Capita (gallons per day finished water)	470	470	470
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	8.0	8.4	9.2
Volume from Traditional Sources[a]	5.2	5.2	5.2
Volume from Alternative Sources[a]	3.6	5.9	5.9
Volume of Reclaimed Water Made Available	1.4	3.9	3.9
Additional Potable Water Needed	0.0	0.0	0.0

a. Projected capacities reflect current CUP quantities.

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	N/A
Alternative[a]			$38.6
Captured Storm Water / Surface Water	2.3	2.3	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	2.5	2.5	
Other	0.0	0.0	
Total	4.8	4.8	$38.6

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

COLLIER COUNTY

Supply Entity: City of Naples Public Utility Department

Service Area: City of Naples

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies are composed of 100 percent traditional fresh groundwater. New potable supplies for the city will be developed from brackish groundwater.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	56,722	65,587	75,625
Per Capita (gallons per day finished water)	321	321	321
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	19.6	21.3	24.6
Volume from Traditional Sources	18.1	18.1	18.1
Volume from Alternative Sources	0.0	10.0	10.0
Reclaimed Capacity Available[a]	9.0	11.7	11.7
Additional Potable Water Needed	0.0	0.0	0.0

a. Reclaimed capacity available for 2015 and 2025 includes 2.7 MGD from stormwater capture project below.

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	N/A
Alternative[a]			$68.2
Captured Storm Water / Surface Water	2.7	2.7	
Brackish Water	10.0	10.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.0	0.0	
Other (potable water ASR)	0.0	0.0	
Total	12.7	12.7	$68.2

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

GLADES COUNTY

Supply Entity: Moore Haven Utilities

Service Area: City of Moore Haven

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies are composed of 100 percent traditional fresh groundwater. A deficit supply condition is projected beginning in the 2006-2010 time frame. Since Moore Haven Utilities did not submit any projects for the LWC Plan Update, the project listed below reflects a SFWMD-proposed project for the city to meet future demand. Although the project contemplates fresh groundwater development, site-specific conditions evaluated during the permitting process will determine actual resource availability. The city should contemplate a back-up plan for supply, including additional conservation and alternative water supply development, in the event that local conditions do not support the project below.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	3,156	3,627	3,947
Per Capita (gallons per day finished water)	127	127	127
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	0.4	0.5	0.5
Volume from Traditional Sources	0.4	0.7	0.7
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.0	0.0	0.0
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.3	0.3	$0.5
Alternative[a]			$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.0	0.0	
Other	0.0	0.0	
Total	0.3	0.3	$0.5

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

HENDRY COUNTY

Supply Entity: Clewiston Public Utilities

Service Area: City of Clewiston

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Water supplies are currently 100 percent traditional fresh surface water provided by U.S. Sugar Corp. The city's new brackish water facilities are expected to be completed by the summer of 2008, at which time U.S. Sugar water deliveries will be terminated and future water supplies will be 100 percent alternative water supplies. The new alternative water supply facilities will also serve demand (formerly served by U.S. Sugar) in the South-Shore Water Association (SSWA) service area adjacent to Clewiston. The SSWA is within the Lower East Coast Planning Area.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	15,881	18,677	20,949
Per Capita (gallons per day finished water)	115	115	115
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	1.8	2.1	2.4
Volume from Traditional Sources[a]	5.8	0.0	0.0
Volume from Alternative Sources	0.0	3.0	3.0
Reclaimed Water Capacity	1.5	2.5	2.5
Additional Potable Water Needed	0.0	0.0	0.0

a. Clewiston is currently supplied water by U.S. Sugar. Existing traditional source data reflect total permitted capacity of U.S. Sugar withdrawals.

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	N/A
Alternative[a]			$22.3
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	3.0	3.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	1.0	1.0	
Other	0.0	0.0	
Total	4.0	4.0	$22.3

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

HENDRY COUNTY

Supply Entity: Florida Department of Corrections

Service Area: Hendry Correctional Institution

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Water supplies are currently 100 percent traditional fresh groundwater. Future supplies are projected to remain 100 percent fresh groundwater.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	1,362	1,640	1,865
Per Capita (gallons per day finished water)	161	161	161
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	0.2	0.3	0.3
Volume from Traditional Sources	0.6	0.6	0.6
Volume from Alternative Sources	0.0	0.0	0.0
Reclaimed Capacity Available	0.4	0.4	0.4
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	N/A
Alternative[a]			$0.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.0	0.0	
Other	0.0	0.0	
Total	0.0	0.0	$0.0

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

HENDRY COUNTY

Supply Entity: LaBelle Utilities

Service Area: City of LaBelle

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies are composed of 100 percent traditional fresh groundwater. Future supplies are projected to be 100 percent alternative water supplies. Once the brackish supply system is completed (2009), the current fresh groundwater facilities will be decommissioned. Future supply capacities projected by LaBelle Utilities reflect growth well beyond BEBR projections. The city should work with FDCA to reconcile growth projections.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	5,279	7,150	8,671
Per Capita (gallons per day finished water)	135	135	135
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	0.7	1.0	1.2
Volume from Traditional Sources	0.6	0.0	0.0
Volume from Alternative Sources	0.0	5.0	8.0
Volume of Reclaimed Water Made Available	0.2	0.8	1.8
Additional Potable Water Needed	0.6	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	$0.0
Alternative[a]			$51.3
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	5.0	8.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.8	1.8	
Other	0.0	0.0	
Total	5.8	9.8	$51.3

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

HENDRY COUNTY

Supply Entity: Hendry County

Service Area: Portions of Unincorporated NW Hendry County

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies in this area are all Domestic Self-Supply. Future service to the area is proposed by the county as part of an integrated regional services network, including water and wastewater. Future supplies are proposed to consist of alternative water supplies. Future supply capacities projected by Hendry County reflect growth well beyond BEBR projections. The county should work with FDCA to reconcile growth projections.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	5,279	7,150	8,671
Per Capita (gallons per day finished water)	135	135	135
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	0.0	0.4	0.7
Volume from Traditional Sources	0.0	0.0	0.0
Volume from Alternative Sources	0.0	2.7	5.0
Volume of Reclaimed Water Made Available	0.0	1.2	3.0
Additional Potable Water Needed	0.6	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	$0.0
Alternative[a]			$27.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	2.7	5.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	1.2	3.0	
Other	0.0	0.0	
Total	3.9	8.0	$27.0

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

HENDRY COUNTY

Supply Entity: Port LaBelle Utilities

Service Area: Port LaBelle, Portions of Unincorporated Hendry and Glades Counties

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies are composed of 100 percent traditional fresh groundwater. Port LaBelle Utilities submitted three traditional projects to meet future demands. Only one of the projects, development of a 0.9 MGD membrane softening plant, is included in this utility summary. Although the project contemplates fresh groundwater development, site-specific conditions evaluated during the permitting process will determine actual resource availability.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	3,355	4,113	4,729
Per Capita (gallons per day finished water)	78	78	78
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	0.3	0.3	0.4
Volume from Traditional Sources	0.3	0.9	0.9
Volume from Alternative Sources	0.0	0.0	0.0
Volume of Reclaimed Water Made Available	0.3	0.8	2.3
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional[b]	0.9	0.9	$5.6
Alternative[a]			$12.0
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.5	2.0	
Other	0.0	0.0	
Total	1.4	2.9	$17.6

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process. Reclaimed water projects shown here reflect demand and facilities in excess of SFWMD projections.

b. Reflects proposed new 0.9 MGD membrane softening facility with net increase of 0.7 MGD in permitted ADF.

UTILITY SUMMARY

LEE COUNTY

Supply Entity: Bonita Springs Utilities, Inc.

Service Area: City of Bonita Springs, Portions of Unincorporated Lee County

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies are composed of about 46 percent traditional groundwater supplies and 54 percent brackish groundwater. New potable supplies developed by BSU will involve expansion of the existing brackish groundwater facilities.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	45,446	67,534	85,850
Per Capita (gallons per day finished water)	172	172	172
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	7.8	11.6	14.7
Volume from Traditional Sources	5.6	5.6	5.6
Volume from Alternative Sources	6.5	12.5	12.5
Volume of Reclaimed Water Made Available	10.3	10.3	10.3
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	$0.0
Alternative[a]			$29.9
Captured Storm Water / Surface Water	0.6	0.6	
Brackish Water	6.0	6.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.0	0.0	
Other	0.0	0.0	
Total	6.6	6.6	$29.9

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

LEE COUNTY

Supply Entity: Cape Coral Public Utility Department

Service Area: Cape Coral

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Water supplies are currently 100 percent alternative water supplies. Future supplies are projected to remain 100 percent alternative water supplies. Projected reclaimed capacity includes captured storm water and reclaimed from the Project Summary below.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	104,118	189,739	260,035
Per Capita (gallons per day finished water)	135	135	135
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	14.0	25.6	35.1
Volume from Traditional Sources	0.0	0.0	0.0
Volume from Alternative Sources	14.4	39.0	50.4
Reclaimed Capacity Available[a]	25.3	71.2	83.3
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional (3 projects)	0.0	0.0	$0.0
Alternative[a]			$778.0
Captured Storm Water / Surface Water	1.5	1.5	
Brackish Water	24.6	36.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	44.4	56.5	
Other	0.0	0,0	
Total	70.5	94.0	$778.0

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process. Reclaimed projects in this particular case also include harvest of surface water from local canals and an extensive ASR system supporting the reuse system.

UTILITY SUMMARY

LEE COUNTY

Supply Entity: Florida Governmental Utility Authority

Service Area: Lehigh Acres

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Water supplies are currently 100 percent traditional fresh groundwater. A supply deficit condition is projected between 2006 and 2010. Since no projects were submitted by FGUA for the LWC Plan Update, the project below reflects a SFWMD-proposed project for FGUA to meet future water demand.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	29,803	51,873	69,996
Per Capita (gallons per day finished water)	101	101	101
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	3.0	5.2	7.1
Volume from Traditional Sources	3.3	3.3	3.3
Volume from Alternative Sources	0.0	3.0	5.5
Reclaimed Capacity Available	2.4	2.4	2.4
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	$0.0
Alternative[a]			$27.5
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	3.0	5.5	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.0	0.0	
Other	0.0	0.0	
Total	3.0	5.5	$27.5

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

LEE COUNTY

Supply Entity: Fort Myers Public Utility Department

Service Area: City of Fort Myers

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Water supplies are currently 100 percent alternative water supplies (brackish). Future supplies are projected to remain 100 percent alternative water supplies.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	56,287	73,301	85,465
Per Capita (gallons per day finished water)	140	140	140
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	7.9	10.1	12.0
Volume from Traditional Sources	0.0	0.0	0.0
Volume from Alternative Sources	9.6	17.6	20.0
Reclaimed Capacity Available	1.5	15.0	15.0
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	N/A
Alternative[a]			$83.6
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	8.0	10.4	
Seawater	0.0	0.0	
Reclaimed Water[a]	13.5	13.5	
Other (finished water ASR)[b]	1.0	1.0	
Total	22.5	24.9	$83.6

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

b. Finished water ASR capacity is a seasonal capacity. Quantity not included in Population & Supply Summary table above.

UTILITY SUMMARY

LEE COUNTY

Supply Entity: Greater Pine Island Water Association

Service Area: Pine Island and Franchise Area within Cape Coral

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies are composed of 100 percent brackish groundwater. Since no projects were submitted by the Greater Pine Island Water Association (GPIWA) to address the projected increased demands, the project shown below reflects a SFWMD-proposed project for GPIWA to meet future demand. The GPIWA service area boundaries may be amended in the near future, which will affect the projected population and demand. These changes will be addressed in a subsequent LWC Plan Amendment or Update.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	12,024	17,078	22,870
Per Capita (gallons per day finished water)	122	122	122
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	1.5	2.2	2.8
Volume from Traditional Sources	0.0	0.0	0.0
Volume from Alternative Sources	1.3	3.3	3.3
Volume of Reclaimed Water Made Available	0.0	0.0	0.0
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	N/A
Alternative[a]			$9.3
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	2.0	2.0	
Seawater	0.0	0:0	
Reclaimed Water[a]	0.0	0.0	
Other	0.0	0.0	
Total	2.0	2.0	$9.3

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

UTILITY SUMMARY

LEE COUNTY

Supply Entity: Island Water Association

Service Area: City of Sanibel and Little Captiva Island

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

The present supplies are composed of 100 percent brackish groundwater. Treatment capacity exists to meet future demands. Island Water will need to apply for an increase in permitted average daily withdrawals from the brackish supply to meet future demand conditions.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	7,751	8,300	8,547
Per Capita (gallons per day finished water)	493	493	493
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	3.7	4.1	4.2
Volume from Traditional Sources	0.0	0.0	0.0
Volume from Alternative Sources	5.2	5.2	5.2
Reclaimed Capacity Available	1.7	1.7	1.7
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	$0.0
Alternative[a]			$1.5
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	0.0	0.0	
Seawater	0.0	0.0	
Reclaimed Water[a]	0.0	0.0	
Other (finished water ASR)[b]	1.2	1.2	
Total	1.2	1.2	$1.5

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

b. Finished water ASR capacity is a seasonal capacity. Quantity not included in Population & Supply Summary table above.

UTILITY SUMMARY

LEE COUNTY

Supply Entity: Lee County Utilities

Service Area: Portion of Unincorporated Lee County

Population and Supply Summary:

Proposed supply projects by 2015: Adequate

Proposed supply projects by 2025: Adequate

Present supplies are composed of 78 percent traditional fresh groundwater and 22 percent alternative water supplies. The county also purchases water from Bonita Springs Utilities, Fort Myers and Cape Coral.

Item	2005 (Existing)	2015 (Projected)	2025 (Projected)
Population	201,286	250,687	291,302
Per Capita (gallons per day finished water)	118	118	118
(Note: All potable volumes are finished water unless noted.)		MGD	
Potable Water Demand (average annual)	23.7	29.6	34.3
Volume from Traditional Sources	22.8	22.8	22.8
Volume from Alternative Sources	6.5	17.7	17.7
Volume of Reclaimed Water Made Available	14.3	18.8	19.8
Additional Potable Water Needed	0.0	0.0	0.0

Project Summary:

Project Type	Gross Capacity (MGD) 2015	2025	Est. Capital Cost ($ M)
Traditional	0.0	0.0	$0.0
Alternative[a]			$45.1
Captured Storm Water / Surface Water	0.0	0.0	
Brackish Water	11.2	11.2	
Seawater	0.0	0.0	
Reclaimed Water[a]	4.5	5.5	
Other (finished water ASR)[b]	0.4	0.4	
Total	16.1	17.1	$45.1

a. Reclaimed water in some applications may reduce per capita demands or offset some limitations on resource availability. This will be examined on a case-by-case basis during the permitting process.

b. Finished water ASR capacity is a seasonal capacity. Quantity not included in Population & Supply Summary table above.

AGRICULTURAL WATER USE

Agricultural water use includes supplies for crop irrigation. This plan update does not include estimates for livestock watering or aquaculture, the former because of its small size and the latter because most of the use represents a localized flow-through process in which the water returns to the source from which it was taken.


Citrus in the LWC Planning Area

Traditional water sources used for irrigation include fresh surface water and/or fresh groundwater. In the LWC Planning Area, overall agricultural acreage is expected to increase by about 13,400 acres to a total of 361,175 acres. Coastal counties, including Lee and Collier, will collectively lose about 12,300 acres of agricultural lands, primarily to urban development. Inland counties, such as Hendry and Glades, are projected to gain about 25,500 acres of agricultural production. Net water use by agriculture is expected to increase about 4 percent (17 MGD) to 422 MGD by 2025. Additional details about agricultural water use and projected demands are provided in **Appendix D**.

The shift in agricultural acreage from coastal counties to interior counties will produce a corresponding shift in the location of these demands. Traditional sources may or may not be available to meet all new irrigation requirements depending on the specific locations for new operations. Fresh groundwater may be available, but quantities will depend on local conditions, including other uses in the area. In summary, although freshwater resource conditions are expected to be adequate on a large scale to meet the projected future agricultural needs, site-specific conditions may affect availability. Under the circumstances, alternative water supply opportunities should be considered during planning of new agricultural operations in basins where water availability is limited.

As described earlier in this document, there are uncertainties in the availability of traditional water sources that cannot be resolved by this planning effort. This does not preclude agricultural water users from applying for and potentially acquiring consumptive use permits from traditional sources, so long as the conditions of permit issuance are satisfied.

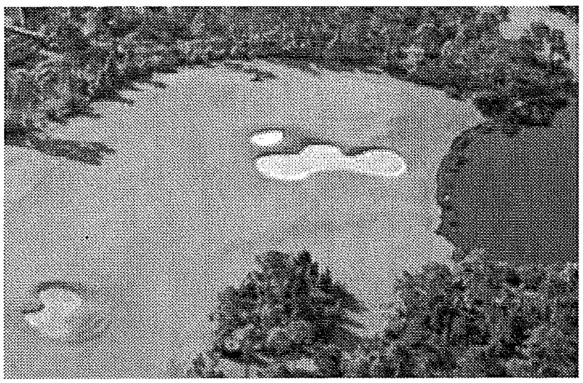
Alternative water supply opportunities for agriculture include storage and application of reclaimed water, storm water, blending (brackish and fresh water), and recapture and reuse of water normally lost to a farm's water management system (tailwater recovery). The type of irrigation system used for various agricultural operations has a significant effect on the amount of water needed to be withdrawn to meet crop demands. Although individual growers select the irrigation system used in their operations, their choice is influenced by the conservation and efficiency requirements in the District's consumptive use permitting (CUP) process as it applies to new installations and permit renewals. New permits for agricultural use generally are required to install low-volume irrigation systems, such as drip or under-tree spray irrigation. The District also offers irrigation audits through the mobile irrigation labs (MILs) serving the LWC Planning Area. These efforts are discussed in **Chapter 5** and **Appendix I**.

THERMOELECTRIC POWER GENERATION SELF-SUPPLY

Thermoelectric Power Generation water use in the LWC Planning Area is expected to grow by approximately 67 MGD during the next 20 years as Florida Power & Light (FPL), south Florida's major power generator, develops new facilities in the LWC Planning Area. Currently, the only power generation facility in the LWC Planning Area is the FPL facility east of Fort Myers. Cooling water for this facility is provided primarily through a brackish water intake on the Caloosahatchee River. The new projected quantity (67 MGD) represents the evaporative losses and boiler make-up water required each day to operate the future facilities, not the total water throughput for each plant. Cooling water sources were unspecified by FPL; however, cooling water needs at other power generation facilities in western and southern Florida are met through a variety of sources, including fresh groundwater, fresh surface water, brackish water and seawater.

No projects were submitted to meet future Thermoelectric Power Generation needs. Considering the expected net water demand for the proposed new FPL power plants (67 MGD), and the freshwater limitations in the LWC Planning Area, alternative water supplies, such as brackish water from the Lower Hawthorn Aquifer, surface water captured during high-flow events or a combination of these resources, are expected to provide the most feasible options to meet the cooling water needs at future power generation facilities.

RECREATIONAL SELF-SUPPLY


Golf Course in the LWC Planning Area

The Recreational Self-Supply category includes irrigation for large landscaped areas, such as parks, golf courses and cemeteries. Historically, irrigation supplies for this category include local fresh groundwater and surface water captured from canals or from ponds in stormwater management systems. In recent years, to meet CUP requirements, irrigation for new golf courses often includes blending brackish groundwater with surface water on-site to meet turf irrigation needs. In the LWC Planning Area, Recreational Self-Supply water demand is projected to increase from the current 39.5 MGD to 46.6 MGD in 2025.

Considering the projected modest increase for growth in this category, most future supplies will come from alternative water supplies and blended supplies (brackish groundwater and fresh surface water). Reclaimed water is primarily used for irrigating large landscaped areas, such as golf courses, parks and cemeteries, as well as for residential and commercial landscaping. Projects submitted by utilities and wastewater generators specify that significant additional reclaimed water will be made available in the future. In most cases, the specific users cannot be identified, but the overall annual average quantity of reclaimed water expected to be made available from new projects in the LWC Planning Area during the next 20 years is about 140 MGD. This includes quantities from reclaimed water treatment plants, and flows captured from seasonal surface water sources for use specifically in the reclaimed system. Of the total amount of new reclaimed supply, over 50 percent is estimated to be available for bulk distribution for such uses as recreational irrigation needs. This amount of newly generated reclaimed water supply is greater than the expected growth in Recreational Self-Supply demand in the LWC Planning Area, which will provide an opportunity to switch current users from traditional sources to reclaimed water.

COMMERCIAL AND INDUSTRIAL SELF-SUPPLY

Commercial and Industrial Self-Supply demand is estimated to grow from the current 26.6 MGD to 28.9 MGD in 2025. Many commercial and industrial water uses are met through public water supply utilities. Others are self-supplied small users located remotely from public water supply lines, and their use falls below the 0.1 MGD (100,000 gallons per day) limit for identification of individual users in this plan update. The estimates in this plan update include the larger self-supplied users, most of which have historically relied on fresh groundwater and, to a limited extent, fresh surface water.

Considering the minimal additional projected need and the lack of specific locations or projects submitted for future Commercial/Industrial Self-Supply, traditional supplies, such as fresh groundwater, are expected to be sufficient to meet future needs in this category. Although fresh groundwater supplies are generally considered adequate to meet the relatively small new demands projected for this use category, alternative water supply development may be warranted depending on local conditions. In addition, the availability and suitability of alternative water supplies, such as reclaimed water, to meet existing and new Commercial/Industrial demands will be evaluated in the CUP process.

DOMESTIC SELF-SUPPLY

Domestic Self-Supply demands in the LWC Planning Area are projected to increase from the current 24 MGD to 31 MGD in 2025. Domestic Self-Supply includes potable water from a private supply, typically a domestic well, serving a private residence. Typically, property owners relying on such systems own, operate and maintain their domestic wells. Domestic Self-Supply needs are met almost exclusively using fresh groundwater.

Considering the limited options for Domestic Self-Supply, all future needs in this use category are expected to be met using fresh groundwater supplies. However, areas of concentrated domestic wells, such as Cape Coral and Lehigh Acres, are experiencing chronic "dry well" problems each dry season. Continued urban development and the resulting increases in domestic well installations in those areas will exacerbate these problems and may eventually lead the District to consider limitations on new well installations to preserve resources. Potential solutions may include, but are not limited to, connection of such areas to the municipal supply system and adoption of additional landscape ordinances that serve to minimize outdoor irrigation needs. When municipal supply becomes available to a particular area, municipalities should consider requirements that Domestic Self-Supply be terminated, and that such wells be properly plugged and abandoned in that area.

CONCLUSION

Meeting the projected increase of 197 MGD in net water demand in the LWC Planning Area during the next 20 years will require continued emphasis on alternative water supply development, including development of brackish groundwater resources, reclaimed water and seasonally available surface water. Development of additional storage, such as ASR, will also be critical to improving access to seasonal supplies to help meet future needs. The District should focus resources on facilitating ASR and other large-scale storage opportunities to facilitate development of seasonal water supplies. Attention also must be focused on continued assessment of conditions in the brackish Floridan Aquifer to facilitate the most responsible development of this resource.

Traditional water supplies, including fresh groundwater and surface water from the Caloosahatchee River, are not expected be adequate to meet all projected demands. Although development may be practicable in some areas, permitting new traditional supplies will depend largely on local resource conditions.

The largest change in water demand during the next 20 years will be seen in the Public Water Supply sector, which will increase from the current 128 MGD to 225 MGD. Over 140 new public water supply projects were evaluated as part of this plan update. The result of this process is that proposed new public water supply project capacity exceeds the 2025 projected demand by 99 MGD. Projects specific to each major public water supplier are included and focus on development of alternative potable water supplies to meet future needs. Individual utilities may also find some component of their future need can be cost-effectively met through new demand management programs and/or reclaimed water projects.

Regionwide, traditional resources are expected to be sufficient to meet the projected 17 MGD increase in agricultural demand in the next 20 years. However, local conditions may limit the availability of freshwater resources for Agriculture (as well as other use categories). Agricultural users should also investigate and implement alternative supplies in basins where water availability is limited.

Domestic Self-Supply use is projected to increase by 7 MGD in the next 20 years. Concentrations of domestic wells in Cape Coral have resulted in rapidly declining Sandstone/Mid-Hawthorn aquifer levels. Similar concentrations of domestic wells in Lehigh Acres cause large, seasonal swings and a declining water level trend in the Sandstone Aquifer. The most obvious result of these conditions is the chronic well failures experienced in both areas during dry periods. These conditions are exacerbated each year with additional development of domestic wells. Local solutions, such as extending public water service to these areas, should be accelerated.

Thermoelectric Power Generation water supply needs are projected to increase by 67 MGD with the development of new power generation facilities in the LWC Planning Area. Specific locations for new facilities are unavailable. Investigation of water resource availability should factor heavily into site selection for these new facilities. Meeting these needs is likely to require use and/or development of alternative water supplies.

Other use categories, such as Recreational Self-Supply and Commercial/Industrial Self-Supply, are projected to grow by about 7.1 MGD and 2.3 MGD, respectively, in the next 20 years. These future needs are expected to be met largely through use and development of alternative water supplies.

The inclusion of specific Water Supply Development projects to address projected needs for the next 20 years is a new requirement of state law. The District recognizes there are public water supply utilities conducting detailed studies to estimate population and demand increases and identify the most appropriate water supply project options to meet those future needs. In addition, other large water users, especially thermoelectric utilities and agricultural users, will require time to identify the specific water supply projects to be developed once the locations of their water supply needs have been determined. For these reasons, the District will consider amending the regional water supply plans on an annual basis for the next three years to allow for the inclusion of additional, specific alternative water supply projects. Such amendments, if needed, are proposed to be done during January and February for the next three years. Only local governments that are affected by the additional alternative water supply projects would be required to amend their comprehensive plans, consistent with the requirements of Section 163.3177(6)(c), F.S. It is anticipated at the end of the three-year period, this annual plan amendment process would be re-evaluated.

This 2005–2006 LWC Plan Update contains a variety of water supply-related information useful to local governments in the preparation and amendment of their comprehensive plans. Within 18 months following the approval of this water supply plan update, local governments within the LWC Planning Area are required to revise their comprehensive plans and adopt revisions to their 10-Year Water Supply Facilities Work Plans to include specific water supply projects.

In addition, through the Water Protection and Sustainability Program, cost-sharing funds specifically for the construction of alternative water supply projects are provided on an annual basis through state revenues and matching District funds. Local governments whose alternative water supply projects are included in this plan update are eligible for consideration.

Glossary

1-in-10 Year Drought A drought of such intensity, that it is expected to have a return frequency of once in ten years. A drought, in which below normal rainfall, has a 90 percent probability of being exceeded over a twelve-month period. A drought event that results in an increase in water demand to a magnitude that would have a 10 percent probability of being exceeded during any given year.

1-in-10 Year Level of Certainty A water supply planning goal to assure at least a 90 percent probability, during any given year that all the needs of reasonable-beneficial water uses will be met while also sustaining water resources and related natural systems during a 1-in-10 year drought event.

Acceler8 Part of the Comprehensive Everglades Restoration Plan (CERP) program, Acceler8 accelerates eight restoration projects through SFWMD's issuance of "Certificates of Participation" bond revenue for construction finance. Acceler8 projects include: C-44 (St. Lucie Canal) Reservoir / Stormwater Treatment Area (STA), C-43 (Caloosahatchee River) West Reservoir, Everglades Agricultural Area (EAA) Reservoir - Phase 1 with Bolles & Cross Canals Improvements, Everglades Agricultural Area (EAA) Stormwater Treatment Areas (STAs) Expansion, Water Preserve Areas - Includes Site 1, C-9, C-11, Acme Basin B, WCA-3A/3B, Picayune Strand (Southern Golden Gate Estates) Restoration, Biscayne Bay Coastal Wetlands - Phase 1, and C-111 Spreader Canal.

Acre-foot The volume of water that covers one acre to a depth of one foot; 43,560 cubic feet; 1,233.5 cubic meters; 325,872 gallons.

Alternative Water Supply Salt water; brackish surface and groundwater; surface water captured predominately during wet-weather flows; sources made available through the addition of new storage capacity for surface or groundwater, water that has been reclaimed after one or more public supply, municipal, industrial, commercial, or agricultural uses; the downstream augmentation of water bodies with reclaimed water; stormwater; and any other water supply source that is designated as nontraditional for a water supply planning region in the applicable regional water supply plan. (Section 373.019, F.S.).

Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) A simple water budget model for estimating irrigation demands that estimates demand based on basin specific data.

Agricultural Self-Supplied Water Demand The water used to irrigate crops, to water livestock and for aquaculture (e.g., fish production) that is not supplied by a public water supply utility.

Annual Average Daily Flow The total volume of wastewater flowing into a wastewater facility during any consecutive 365 days, divided by 365 and expressed in units of MGD.

Aquifer A geologic formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs.

Aquifer Storage and Recovery (ASR) Stormwater, surface water, or reclaimed water is appropriately treated to potable standards and injected into an aquifer through approved Class V injection wells during wet periods with the intent to recover the water for treatment and reuse in the future during dry periods.

Aquifer System A heterogeneous body of intercalated permeable and less permeable material that acts as a water-yielding hydraulic unit of regional extent.

Area of Influence For groundwater systems the area of influence is defined by the cone of depression, and for surface water systems the area of influence is defined as the extent to which the withdrawal results in a measurable change in surface water levels or flows.

Artesian A commonly used expression, generally synonymous with Confined and referring to subsurface (ground) bodies of water which, due to underground drainage from higher elevations and confining layers of soil material above and below the water body (referred to as an Artesian Aquifer), result in underground water at pressures greater than atmospheric.

Available Supply The maximum amount of reliable water supply including surface water, groundwater and purchases under secure contracts.

Average Daily Demand A water system's average daily use based on total annual water production (total annual gallons or cubic feet divided by 365).

Average Rainfall Year A year having rainfall with a 50 percent probability of being exceeded over a twelve-month period.

Backpumping The practice of actively pumping water leaving an area back into a surface water body.

Basin (Groundwater) A hydrologic unit containing one large aquifer or several connecting and interconnecting aquifers.

Basin (Surface Water) A tract of land drained by a surface water body or its tributaries.

Basis of Review (BOR) From the District's publication, *Basis of Review for Water Use Permit Applications within the South Florida Water Management District.* Read in conjunction with Chapters 40E-2 and 40E-20, the Basis of Review further specifies the general procedures and information used by District staff for review of water use permit applications with the primary goal of meeting District water resource objectives.

Best Management Practices (BMPs) Agricultural management activities designed to achieve an important goal, such as reducing farm runoff or optimizing water use.

Biscayne Aquifer A portion of the Surficial Aquifer System, which provides most of the fresh water for public water supply and agriculture within Miami-Dade, Broward and southeastern Palm Beach County. It is highly susceptible to contamination due to its high permeability and proximity to land surface in many locations.

Blaney-Criddle A formula to calculate evapotranspiration (ET) based on mean temperature and number of daylight hours. The Water Supply Department allocates water using a version of the Blaney-Criddle that employs months as time increments. The 'Modified Blaney-Criddle' is a variation of Blaney-Criddle, which multiplies the ET from Blaney-Criddle by a coefficient that relates mean air temperature to the growth stage of a crop. Additionally, effective rainfall is calculated using the mean temperature and hours of daylight, the Blaney-Criddle ET, average monthly rainfall and a soil factor. Further calculations consider average rainfall to drought rainfall (1-in-10 year drought). The difference between monthly drought effective rainfall and monthly ET becomes the basis for water allocations.

Brackish Water, Saline Water or **Seawater** Water containing significant amounts or concentrations of dissolved salts or total dissolved solids (TDS). The concentration is the amount (by weight) of salt in water, expressed in "parts per million" (ppm) or milligrams per liter (mg/L). The terms fresh, brackish, saline and brine are used to describe the quality of the water. (~1 mg/L TDS = 0.5 mg/L of Chlorides.)

Capacity Capacity represents the ability to treat, move or reuse water. Typically, capacity is expressed in million gallons per day (MGD).

Captured Stormwater/Surface Water Water captured predominantly during wet weather flow and stored above ground or underground for future beneficial use.

Central and Southern Florida Project Comprehensive Review Study (C&SF Restudy) A five-year study effort that looked at modifying the current C&SF Project to restore the greater Everglades and south Florida ecosystem, while providing for the other water-related needs of the region. The study concluded with the Comprehensive Plan being presented to the Congress on July 1, 1999. The recommendations made within the Restudy, that is, structural and operational modifications to the C&SF Project, are being further refined and will be implemented in the Comprehensive Everglades Restoration Plan (CERP).

Central and Southern Florida Flood Control Project (C&SF Project) A complete system of canals, storage areas and water control structures spanning the area from Lake Okeechobee to both the east and west coasts and from Orlando south to the Everglades. It was designed and constructed during the 1950s by the United States Army Corps of Engineers (USACE) to provide flood control and improve navigation and recreation.

Commercial and Industrial Self-Supplied Water Demand Water used by commercial and industrial operations withdrawing a minimum water quantity of 100,000 gallons per day (GPD) from individual, on-site wells.

Comprehensive Everglades Restoration Plan (CERP) The framework and guide for the restoration, protection and preservation of the south Florida ecosystem. The CERP also provides for water-related needs of the region, such as water supply and flood protection.

Confining Unit A body of significantly less permeable material than the aquifer, or aquifers, that it stratigraphically separates. The hydraulic conductivity may range from nearly zero to some value significantly lower than that of the adjoining aquifers.

Conservation (See *Water Conservation.*)

Consumptive Use Any use of water which reduces the supply from which it is withdrawn or diverted

Consumptive Use Permitting (CUP) The issuance of permits by the SFWMD, under authority of Chapter 40E-2, F.A.C., allowing withdrawal of water for consumptive use.

Control Structure A man-made structure designed to regulate the level/flow of water in a canal or water body (e.g., weirs, dams).

Demand The quantity of water needed to be withdrawn to fulfill a requirement.

Demand Management Reducing the demand for water through activities that alter water use practices, improve efficiency in water use, reduce losses of water, reduce waste of water, alter land management practices and/or alter land uses.

Desalination A process that treats saline water to remove or reduce chlorides and dissolved solids, resulting in the production of fresh water.

Discharge The rate of water movement past a reference point, measured as volume per unit time (usually expressed as cubic feet or cubic meters per second).

Disinfection The process of inactivating microorganisms that cause disease. All potable water requires disinfection as part of the treatment process prior to distribution. Disinfection methods include chlorination, ultraviolet (UV) radiation and ozonation.

Disposal Effluent disposal involves the wasteful practice of releasing treated effluent back to the environment using ocean outfalls, surface water discharges and deep injection wells.

Domestic Self-Supplied (DSS) Water Demand The water used by households whose primary source of water is water treatment facilities and/or private wells with pumpages of less than 100,000 gallons per day (GPD).

Domestic Use Use of water for household purposes of drinking, bathing, cooking or sanitation.

Domestic Wastewater Wastewater derived principally from dwellings, business buildings, institutions and the like; sanitary wastewater; sewage.

Drainage District A locally constituted drainage, water management or water control district that is created by special act of the legislature and authorized under Ch. 298, F.S., to constrict, complete, operate, maintain, repair and replace any and all works necessary to implement an adopted water control plan.

Drawdown The vertical distance between the static water level and the surface of the cone of depression.

Drought A long period of abnormally low rainfall, especially one that adversely affects growing or living conditions.

Ecosystem Biological communities together with their environment, functioning as a unit.

Effluent Water that is not reused after flowing out of any plant or other works used for the purpose of treating, stabilizing, or holding wastes. Effluent is "disposed" of.

Electrodialysis Dialysis that is conducted with the aid of an electromotive force applied to electrodes adjacent to both sides of the membrane.

Elevation The height in feet above mean sea level according to North American Vertical Datum (NAVD). May also be expressed in feet above mean sea level (MSL) as reference datum.

Environmental Resource Permit (ERP) A permit issued by the SFWMD under authority of Chapter 40E-4, F.A.C. to ensure that land development projects do not cause adverse environmental, water quality or water quantity impacts.

Estuary The part of the wide lower course of a river where its current is met by ocean tides or an arm of the sea at the lower end of a river where fresh and salt water meet.

Evapotranspiration (ET) The total loss of water to the atmosphere by evaporation from land and water surfaces and by transpiration from plants.

Everglades Agricultural Area (EAA) An area of histosols (muck) extending south from Lake Okeechobee to the northern levee of WCA-3A, from its eastern boundary at the L-8 Canal to the western boundary along the L-1, L-2 and L-3 levees. The EAA incorporates almost 3,000 square kilometers (1,158 square miles) of highly productive agricultural land.

Everglades Protection Area This area is composed of the Water Conservation Areas and Everglades National Park.

Existing Legal Use of Water A water use that is authorized under a District water use permit or is existing and exempt from permit requirements.

Fallow Land left unseeded during a growing season. The act of plowing land and leaving it unseeded. The condition or period of being unseeded.

Fiscal Year (FY) The South Florida Water Management District's fiscal year begins on October 1 and ends on September 30 the following year.

Florida Administrative Code (F.A.C.) The Florida Administrative Code is the official compilation of the administrative rules and regulations of state agencies.

Florida Department of Agricultural and Consumer Services (FDACS) FDACS communicates the needs of the agricultural industry to the Florida Legislature, the FDEP and the water management districts, and ensures participation of agriculture in the development and implementation of water policy decisions. FDACS also oversees Florida's soil and water conservation districts, which coordinate closely with the federal Natural Resources Conservation Service (NRCS).

Florida Department of Environmental Protection (FDEP) The SFWMD operates under the general supervisory authority of the FDEP, which includes budgetary oversight.

Florida Statutes (F.S.) The Florida Statutes are a permanent collection of state laws organized by subject area into a code made up of titles, chapters, parts and sections. The Florida Statutes are updated annually by laws that create, amend or repeal statutory material.

Florida Water Plan State-level water resource plan developed by the FDEP under Section 373.036, F.S.

Floridan Aquifer System (FAS) A highly-used aquifer system composed of the Upper Floridan and Lower Floridan Aquifers. It is the principal source of water supply north of Lake Okeechobee and the upper Floridan Aquifer is used for drinking water supply in parts of Martin and St. Lucie counties. From Jupiter to south Miami, water from the Floridan Aquifer System is mineralized (total dissolved solids are greater than 1,000 mg/L) along coastal areas and in southern Florida.

Flow The actual amount of water flowing by a particular point over some specified time. In the context of water supply, flow represents the amount of water being treated, moved or reused. Flow is frequently expressed in millions of gallons per day (MGD).

Fresh Water Water with less than 1,000 mg/L of TDS, but drinking water, by EPA standards, must have less than 500 mg/L of TDS. (~1 mg/L TDS = 0.5 mg/L of Chlorides.)

Geographic Information Systems (GIS) The abstract representation of natural (or cultural) features of a landscape into a digital database, geographic information system.

Governing Board Governing Board of the South Florida Water Management District.

Groundwater Water beneath the surface of the ground, whether or not flowing through known and definite channels. Specifically, that part of the subsurface water in the saturated zone, where the water is under pressure greater than the atmosphere.

Harm As defined in Rule 40E-8, F.A.C., the temporary loss of water resource functions that results from a change in surface or groundwater hydrology and takes a period of one to two years of average rainfall conditions to recover.

Heterogeneity The condition of a sample of matter that is composed of particles or aggregates of different substances of dissimilar composition.

Hydrology The scientific study of the properties, distribution and effects of water on the earth's surface, in the soil and underlying rocks and in the atmosphere.

Hydroperiod The frequency and duration of inundation or saturation of an ecosystem. In the context of characterizing wetlands, the term hydroperiod describes that length of time during the year that the substrate is either saturated or covered with water.

Infiltration The movement of water through the soil surface into the soil under the forces of gravity and capillarity.

Intermediate Aquifer System (IAS) This aquifer system consists of five zones of alternating confining and producing units. The producing zones include the Sandstone and Mid-Hawthorn aquifers.

Intrusion (See *Saline Water of Saltwater Intrusion.*)

Irrigation The application of water to crops and other plants by artificial means.

Irrigation Efficiency The average percent of total water pumped or delivered for use that is delivered to the root zone of a plant.

Karst A topography formed over limestone, dolomite or gypsum and characterized by sinkholes, caves and underground drainage.

Lake Okeechobee Largest freshwater lake in Florida. Located in central Florida, the lake measures 730 square miles and is the second largest freshwater lake wholly within the United States.

Landscape Irrigation The outside watering of shrubbery, trees, lawns, grass, ground covers, vines, gardens and other such flora, not intended for resale, which are planted and are situated in such diverse locations as residential and recreation areas, cemeteries, public, commercial and industrial establishments, and public medians and rights of way.

Levee An embankment to prevent flooding or a continuous dike or ridge for confining the irrigation areas of land to be flooded.

Level of Certainty A water supply planning goal to assure at least a 90 percent probability, during any given year that all the needs of reasonable-beneficial water uses will be met while also sustaining water resources and related natural systems during a 1-in-10 year drought event.

Load Concentration times flow.

Maximum Daily Allocation The maximum quantity permitted to be withdrawn in any single 24-hour period.

Maximum Monthly Allocation The maximum quantity of water assigned to the permit to be withdrawn during the month in the growing season when the largest supplemental crop requirement is needed by the specific crop for which the allocation is permitted.

Microfiltration A membrane separation process in which particles greater than about 20 nanometers in diameter are screened out of a liquid in which they are suspended.

Microirrigation The application of small quantities of water on or below the soil surface as drops or tiny streams of spray through emitters or applicators placed along a water delivery line. Microirrigation includes a number of methods or concepts such as bubbler, drip, trickle, mist or microspray and subsurface irrigation.

Minimum Flow and Level (MFL) The point at which further withdrawals would cause significant harm to the water resources.

Mobile Irrigation Laboratory (MIL) A vehicle furnished with irrigation evaluation equipment, which is used to carry out on-site evaluations of irrigation systems and to provide recommendations on improving irrigation efficiency.

MODFLOW A fine-scale model code created by the U.S. Geological Survey. The District uses it for subregional and groundwater modeling.

Monthly Average Daily Flow The total volume of wastewater flowing into a wastewater facility during a calendar month, divided by the number of days in that month and expressed in units of MGD.

Natural Resources Conservation Service (NRCS) An agency of the U.S. Department of Agriculture (USDA) that provides technical assistance for soil and water conservation, natural resource surveys and community resource protection. Formerly the U.S. Soil Conservation Service (SCS).

Net Water Demand The water demands of the end user, after accounting for treatment and process losses and inefficiencies (e.g. irrigation inefficiency). When discussing public water supply, the term "finished water demand" is commonly used.

North American Vertical Datum (NAVD) The official civilian vertical control datum (reference for elevation data) for surveying and mapping activities in the United States.

Nutrients Organic or inorganic compounds essential for the survival of an organism. In aquatic environments, nitrogen and phosphorus are important nutrients that affect the growth rate of plants.

Outflow The act or process of flowing out of.

Per Capita Use Total use divided by the total population served.

Performance Measure Performance measures quantify how well or how poorly an alternative meets a specific objective. Good performance measures are quantifiable, have a specific target, indicate when a target has been reached, and measure the degree to which the goal has been met.

Permeability Defines the ability of a substrate to transmit fluid.

Phosphorus (P) An element that is essential for life. In freshwater aquatic environments, phosphorus is often in short supply; increased levels can promote the growth of algae and other plants.

Potable Water Water that is safe for human consumption.

Potentiometric Head The level to which water will rise when a well is pierced in a confined aquifer.

Potentiometric Surface A surface, which represents the hydraulic head in an aquifer and is defined by the level to which water will rise above a datum plane in wells that penetrate the aquifer.

Public Water Supply (PWS) Water that is withdrawn, treated, transmitted and distributed as potable or reclaimed water.

Public Water Supply (PWS) Demand All potable (drinking quality) water supplied by water treatment facilities with projected average pumpages greater than 100,000 gallons per day to all types of customers, not just residential.

Ratoon A shoot sprouting from a plant base, as in the banana, pineapple, or sugarcane. A Ratoon Crop A crop cultivated from the shoots of a perennial plant.

Raw Water Demand The amount of water that must be withdrawn from the groundwater or surface water system to meet a particular need. Withdrawal demands are nearly always higher than User/Customer Demand because of inherent treatment and process losses, and inefficiencies associated with delivering water from the source to the end user.

Reasonable-Beneficial Use Use of water in such quantity as is necessary for economic and efficient utilization for a purpose, which is both reasonable and consistent with the public interest.

Reclaimed Water Water that has received at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility. (Chapter 62-610, F.A.C.).

Recreational Self-Supplied Water Demand The water used for landscape and golf course irrigation. The landscape subcategory includes water used for parks, cemeteries and other irrigation applications greater than 100,000 gallons per day. The golf course subcategory includes those operations not supplied by a public water supply or regional reuse facility.

Regional Irrigation Distribution System (RIDS) An interconnection pipeline system to deliver irrigation water, which considers reuse and alternative water supplies, such as supplemental surface water.

Regional Water Supply Plan Detailed water supply plan developed by the District under Section 373.0361, F.S., providing an evaluation of available water supply and projected demands, at the regional scale. The planning process projects future demand for 20 years and recommends projects to meet identified needs.

Reservations of Water (See *Water Reservations.*)

Reservoir A man-made or natural water body used for water storage.

Restudy Shortened name for C&SF Restudy.

Retention The prevention of stormwater runoff from direct discharge into receiving waters; included as examples are systems which discharge through percolation, exfiltration, filtered bleed-down and evaporation processes.

Retrofit The replacement of existing equipment with equipment of higher efficiency.

Retrofitting The replacement of existing water fixtures, appliances and devices with more efficient fixtures, appliances and devices for the purpose of conservation.

Reuse The deliberate application of reclaimed water for a beneficial purpose. Criteria used to classify projects as "reuse" or "effluent disposal" are contained in Rule 62-610.810, F.A.C. The term "reuse" is synonymous with "water reuse."

Reverse Osmosis (RO) A membrane process for desalting water using applied pressure to drive the feedwater (source water) through a semipermeable membrane.

Runoff That component of rainfall which is not absorbed by soil, intercepted and stored by surface water bodies, evaporated to the atmosphere, transpired and stored by plants, or infiltrated to groundwater, but which flows to a watercourse as surface water flow.

Saline Water Any water that contains more than 1,000 mg/L of TDS. This may be brackish water (1000 to 15,000 mg/L of TDS), seawater (15,000 to 40,000 mg/L of TDS), or brine (more than 40,000 mg/L of TDS). It is common in the literature to define coastal water that is very brackish simply as saline water. (~1 mg/L TDS = 0.5 mg/L of Chlorides.)

Saline Water or Saltwater Interface The hypothetical surface of chloride concentration between fresh water and seawater where the chloride concentration is 250 mg/L at each point on the surface.

Saline Water or Saltwater Intrusion The invasion of a body of fresh water by a body of salt water, due to its greater density. It can occur either in surface water or groundwater bodies. The term is applied to the flooding of freshwater marshes by seawater, the upward migration of seawater into rivers and navigation channels, and the movement of seawater into freshwater aquifers along coastal regions.

Salinity Of or relating to chemical salts (usually measured in parts per thousand, or ppt).

Seawater, Saline Water or **Brackish Water** Water containing significant amounts or concentrations of dissolved salts or total dissolved solids (TDS). The concentration is the amount (by weight) of salts in water, expressed in "parts per million" (ppm) or milligrams per liter (mg/L). The terms fresh, brackish, saline, and brine are used to describe the quality of the water. (~1 mg/L TDS = 0.5 mg/L of Chlorides.)

Self-Supplied The water used to satisfy a water need, not supplied by a public water supply utility.

Semi-Confined Aquifer A completely saturated aquifer that is bounded above by a semi-pervious layer, which has a low, though measurable permeability, and below by a layer that is either impervious or semi-pervious.

Semi-confining Layers Layers with little or no horizontal flow, restricting the vertical flow of water from one aquifer to another. The rate of vertical flow is dependent on the head differential between the aquifers, as well as the vertical permeability of the sediments in the semi-confining layer.

Serious Harm As defined in Rule 40E-8, F.A.C., the long-term loss of water resource functions resulting from a change in surface or groundwater hydrology.

Service Area The geographical region in which a water supplier has the ability and the legal right to distribute water for use.

Significant Harm As defined in Rule 40E-8, F.A.C., the temporary loss of water resource functions, which result from a change in surface or groundwater hydrology, that takes more than two years to recover, but which is considered less severe than serious harm. The specific water resource functions addressed by a MFL and the duration of the recovery period associated with significant harm are defined for each priority water body based on the MFL technical support document.

Slough A channel in which water moves sluggishly, or a place of deep muck, mud or mire. Sloughs are wetland habitats that serve as channels for water draining off surrounding uplands and/or wetlands.

Stage The height of a water surface above an established reference point (datum or elevation).

Storm Water Water that does not infiltrate, but accumulates on land as a result of storm runoff, snowmelt runoff, irrigation runoff or drainage from areas such as roads and roofs.

Stormwater Treatment Area (STA) A system of constructed water quality treatment wetlands that use natural biological processes to reduce levels of nutrients and pollutants from surface water runoff.

Submerged Aquatic Vegetation (SAV) Wetland plants that exist completely below the water surface.

Subregional Groundwater Model A computer model that is used to simulate impacts on a smaller scale than the SFWMM, such as effects within public water supply service areas and impacts of individual wellfields.

Supplemental Irrigation Requirement (SIR) The volume of water, usually expressed in acre-inches, representing the difference between the estimated evapotranspiration of a given crop and the effective rainfall available in a specific geographic area over some prescribed time period and climatic event.

Supply-side Management The conservation of water in Lake Okeechobee to ensure that water demands are met while reducing the risk of serious or significant harm to natural systems.

Surface Water Water above the soil or substrate surface, whether contained in bounds created naturally or artificially or diffused. Water from natural springs is classified as surface water when it exits from the spring onto the earth's surface.

Surficial Aquifer System (SAS) Often the principal source of water for urban uses within certain areas of south Florida. This aquifer is unconfined, consisting of varying amounts of limestone and sediments that extend from the land surface to the top of an intermediate confining unit.

Swamp A frequently or continuously inundated forested wetland.

Thermoelectric Self-Supplied Water Demand The difference in the amount of water withdrawn by electric power generating facilities for cooling purposes and the water returned to the hydrologic system near the point of withdrawal.

Three-month Average Daily Flow The total volume of wastewater flowing into a wastewater facility during a period of three consecutive months, divided by the number of days in this three-month period and expressed in units of MGD. The three-month average daily flow also can be calculated by adding the three monthly average daily flows observed during this three-month period and dividing by three. The three-month average daily flow is a rolling average that is to be assessed for each month of the year.

Total Maximum Daily Load (TMDL) The maximum allowed level of pollutant loading for a water body, while still protecting its uses and maintaining compliance with water quality standards, as defined in the *Clean Water Act*.

Transmissivity A term used to indicate the rate at which water can be transmitted through a unit width of aquifer under a unit hydraulic gradient. It is a function of the permeability and thickness of the aquifer, and is used to judge its production potential.

Treatment Facility Any plant or other works used for the purpose of treating, stabilizing, or holding wastewater.

Tributary A stream that flows into a larger stream or other body of water.

Upconing Process by which saline water underlying fresh water in an aquifer rises upward into the freshwater zone as a result of pumping water from the freshwater zone.

User/Customer Demand (See *Net Demand.*)

Utility Any legal entity responsible for supplying potable water for a defined service area.

Wastewater The combination of liquid and water-carried pollutants from residences, commercial buildings, industrial plants and institutions together with any groundwater, surface runoff or leachate that may be present.

Water Conservation Reducing the demand for water through activities that alter water use practices, e.g., improving efficiency in water use, and reducing losses of water, waste of water and water use.

Water Conservation Areas (WCAs) Part of the original Everglades ecosystem that is now diked and hydrologically controlled for flood control and water supply purposes. These are located in the western portions of Miami-Dade, Broward and Palm Beach counties, and preserve a total of 1,337 square miles, or about 50 percent of the original Everglades.

Water Preserve Areas (WPA) Multipurpose water-holding areas located along the western border of southeast Florida's urbanized corridor.

Water Reservations State law on water reservations, in Section 373.223(4), F.S., defines water reservations as follows: "The governing board or the department, by regulation, may reserve from use by permit applicants, water in such locations and quantities, and for such seasons of the year, as in its judgment may be required for the protection of fish and wildlife or the public health and safety. Such reservations shall be subject to periodic review and revision in the light of changed conditions. However, all presently existing legal uses of water shall be protected so long as such use is not contrary to the public interest."

Water Resource Development The formulation and implementation of regional water resource management strategies, including the collection and evaluation of surface water and groundwater data; structural and nonstructural programs to protect and manage the water resources; the development of regional water resource implementation programs; the construction, operation and maintenance of major public works facilities to provide for flood control, surface and underground water storage and groundwater recharge augmentation; and related technical assistance to local governments and to government-owned and privately-owned water utilities. (Section 373.019, F.S.)

Water Reuse (See *Reuse.*)

Watershed A region or area bounded peripherally by a water parting and draining ultimately to a particular watercourse or body of water.

Water Shortage Declaration If there is a possibility that insufficient water will be available within a source class to meet the estimated present and anticipated user demands from that source, or to protect the water resource from serious harm, the governing board may declare a water shortage for the affected source class. (Rule 40E- 21.231, F.A.C.) Estimates of the percent reduction in demand required to match available supply is required and identifies which phase of drought restriction is implemented. A gradual progression in severity of restriction is implemented through increasing phases. Once declared, the District is required to notify permitted users by mail of the restrictions and to publish restrictions in area newspapers.

Water Supply Development The planning, design, construction, operation and maintenance of public or private facilities for water collection, production, treatment, transmission or distribution for sale, resale or end use. (Section 373.019(24), F.S.)

Water Supply Plan (See *Regional Water Supply Plan.*)

Water Table The surface of a body of unconfined groundwater at which the pressure is equal to that of the atmosphere; defined by the level where water within an unconfined aquifer stands in a well.

Water Use Any use of water, which reduces the supply from which it is withdrawn or diverted.

Water Well Any excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed when the intended use of such excavation is for the location, acquisition, development, or artificial recharge of groundwater. This term does not include any well for the purpose of obtaining or prospecting for oil, natural gas, minerals, or products of mining or quarrying; for inserting media to dispose of oil brines or to repressure oil-bearing or natural gas-bearing formation; for storing petroleum, natural gas, or other products; or for temporary dewatering of subsurface formations for mining, quarrying or construction purposes. (373.303(7), F.S.)

Wetland An area that is inundated or saturated by surface water or groundwater with vegetation adapted for life under those soil conditions (e.g., swamps, bogs and marshes).

Wetland Drawdown Study Research effort by the South Florida Water Management District to provide a scientific basis for developing wetland protection criteria for water use permitting.

Withdrawal Demand (See *Raw Water Demand.*)

Xeriscape™ Landscaping that involves seven principles: proper planning and design; soil analysis and improvement; practical turf areas; appropriate plant selection; efficient irrigation; mulching; and appropriate maintenance.

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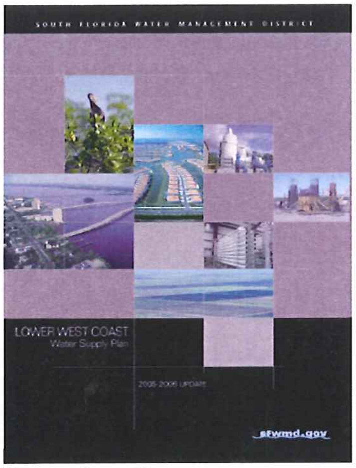

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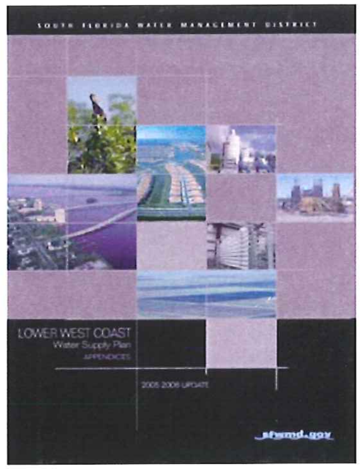

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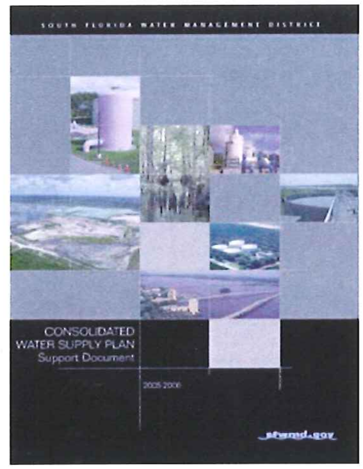

Support Document
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CD 1 – Contains the Lower West Coast Water Supply Plan Update including the Planning Document, Appendices and the Comprehensive Water Supply Plan Support Document

CD 2 – Contains the 2000 Lower West Coast Water Supply Plan Update

A GUIDE FOR LOCAL GOVERNMENTS IN PREPARING WATER SUPPLY COMPREHENSIVE PLAN AMENDMENTS AND WATER SUPPLY FACILITIES WORK PLANS

Florida Department of Community Affairs
Division of Community Planning

September 2007

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ATTACHMENTS

A. INTRODUCTION

Four of Florida's five water management districts have determined that traditional water supply sources currently used in their districts will not be sufficient to meet the demands of the growing population and the needs of the environment, agriculture and industry over the next twenty years. Only the Suwannee River Water Management District has concluded that its traditional water supplies will be sufficient to serve the district's needs over the next twenty years. As potential limitations on the continued use of traditional water supplies became increasingly apparent in recent years, the Florida Legislature enacted bills in 2002, 2004 and 2005 to more effectively address the state's water supply needs by improving the coordination between local land use planning and water supply planning.

2002

The focus of the 2002 legislation was to add requirements to Chapter 163, Florida Statutes (F.S.), for local governments to prepare 10-year water supply facilities work plans and to incorporate the work plans into their comprehensive plans. This legislative change emphasized the need for local comprehensive plans to consider the applicable regional water supply plans prepared by the water management districts. In 2004, the Legislature further amended Chapter 163 to give local governments until December 1, 2006, to prepare the 10-year water supply facilities work plans.

2004
2006

2005

In 2005, the Florida Legislature significantly changed Chapters 163 and 373, F.S., to improve the coordination of water supply and land use planning. Senate Bills 360 and 444 strengthened the statutory linkage between the regional water supply plans prepared by the water management districts and comprehensive plans prepared by the local governments. Implementation of the new water supply planning requirements will ensure that adequate water supplies and public facilities are available to serve the water supply demands of Florida's growing population.

Permitting
- Concurrency

This Guide has been prepared to help local governments understand their responsibilities under current law with regard to water supply planning. It addresses the scope and content of the comprehensive plan amendments required to comply with the current provisions of Chapter 163, F.S., the data and analysis that local governments must provide to support the amendments, the sources of information available to local governments, and the deadlines for adopting the required amendments.

- additional requirements for FLUM amends -08

In addition to this Guide, a second technical assistance document (*Recommendations for Preparing Water Supply and Facility Data and Analysis to Support Local Comprehensive Plan Amendments)* has been prepared to explain the water supply and facilities data and analysis that should be included with comprehensive plan amendments submitted for review to the Department of Community Affairs (Department). The *Recommendations* will soon be available from the Division of Community Planning and will be posted on the Department's website (www.dca.state.fl.us).

incorporates Updating the work prepared at that time as well incorporating additional requirements & requirements to meet the latest requirements

B. STATUTORY REQUIREMENTS

With regard to water supply, current statutory provisions direct each local government to:

① Coordinate

1. Coordinate appropriate aspects of its comprehensive plan with the appropriate water management district's regional water supply plan. [s. 163.3177(4)(a), F.S.] • 151.5 • 151.5.1

② FLUM

2. Ensure that its future land use plan is based upon the availability of adequate water supplies and public facilities and services. [s. 163.3177(6)(a), F.S., effective July 1, 2005.] Data and analysis demonstrating that adequate water supplies and associated public facilities will be available to meet projected growth demands must accompany all proposed Future Land Use Map amendments submitted to the Department for review. The submitted package must also include an amendment to the Capital Improvements Element, if necessary, to demonstrate that adequate public facilities will be available to serve the proposed Future Land Use Map modification. • Amendment Application

Future Amendment

③ Concurrency

policy 37.3.3 53.1.1 53.1.3

3. Ensure that adequate water supplies and facilities are available to serve new development no later than the date on which the local government anticipates issuing a certificate of occupancy and consult with the applicable water supplier prior to approving a building permit, to determine whether adequate water supplies will be available to serve the development by the anticipated issuance date of the certificate of occupancy. [s. 163.3180(2)(a), F.S., effective July 1, 2005.] This "water supply concurrency" is now in effect, and local governments should be complying with the requirement for all new development proposals. In addition, local governments should update their comprehensive plans and land development regulations as soon as possible to address these statutory requirements. The latest point at which the comprehensive plan must be revised to reflect the concurrency requirements is at the time the local government adopts plan amendments to implement the recommendations of the Evaluation and Appraisal Report. • 53.2 • 53.2.1

DO at permit

to reinforce

④ Revise Elements

4. For local governments subject to a regional water supply plan, revise the General Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element (the "Infrastructure Element"), within 18 months after the water management district approves an updated regional water supply plan, to:

   a. Identify and incorporate the alternative water supply project(s) selected by the local government from projects identified in the updated regional water supply plan, or the alternative project proposed by the local government under s. 373.0361(7), F.S. [s. 163.3177(6)(c), F.S.]; Identify alternative

   (Table 6

   Table 6 53.1.11 117.1.9

   b. Identify the traditional and alternative water supply projects, bulk sales agreements, and the conservation and reuse programs necessary to meet current and future water use demands within the local government's jurisdiction [s. 163.3177(6)(c), F.S.]; and Identify traditional policies?

   Refers to Work Plan - addressing each item

   c. Include a water supply facilities work plan for at least a 10-year planning period for constructing the public, private, and regional water supply facilities identified in the element as necessary to serve existing and new • 55.1.3 Work Plan for 10 years development. [s. 163.3177(6)(c), F.S.] Amendments to incorporate the water supply facilities work plan into the comprehensive plan are exempt from the twice-a-year amendment limitation. [s. 163.3177(6)(c), F.S.]

5. Revise the Five-Year Schedule of Capital Improvements to include any water supply, reuse, and conservation projects and programs to be implemented during the five-year period.

6. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Conservation Element to assess projected water needs and sources for at least a 10-year planning period, considering the appropriate regional water supply plan(s) or, ~~in the absence of~~ an approved regional water supply plan, the applicable District Water Management Plan, as well as applicable consumptive use permit(s). [s. 163.3177(6)(d), F.S.]

   If the established planning period of a comprehensive plan is greater than ten years, the plan must address the water supply sources necessary to meet and achieve the existing and projected water use demand *for the established planning period*, considering the appropriate regional water supply plan. [s. 163.3167(13), F.S.]

7. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Intergovernmental Coordination Element to ensure coordination of the comprehensive plan with applicable regional water supply plans and regional water supply authorities' plans. [s. 163.3177(6)(h)1., F.S.]

8. Address in the Evaluation and Appraisal Report (EAR), the extent to which the local government has implemented the 10-year water supply facilities work plan, including the development of alternative water supplies, and determine whether the identified alternative water supply projects, traditional water supply projects, bulk sales agreements, and conservation and reuse programs are meeting local water use demands. [s. 163.3191(2)(l), F.S.]

CIP

(6) Update Cons. Element

5 year

10 year

117.1.9

2030

55.1.3

117.1.9

(7) Update Intergovernmental Element

151.5

151.5.1

C. OVERVIEW OF WATER SUPPLY PLANNING REQUIREMENTS

Concurrency

1. Effective July 1, 2005, **all local governments** must meet water supply concurrency requirements and ensure that their future land use plans (the Future Land Use Element and Future Land Use Map) are based upon the availability of adequate water supplies and associated public facilities. [*See* Paragraphs B.2.-3. above.] All local governments are advised to update their comprehensive plans and land development regulations as soon as possible to address the water supply concurrency requirement. [*See* Section E below.] Data and analysis to demonstrate that adequate water supplies and associated public facilities are (or will be) available to meet projected growth demands must accompany all proposed Future Land Use Map amendments submitted to the Department for review. [*See Recommendations for Preparing Water Supply and Facility Data and Analysis to Support Local Comprehensive Plan Amendments.]*

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2. **Local governments subject to a regional water supply plan** must revise their comprehensive plans within 18 months after the water management district approves a regional water supply plan or its update, to ensure that:

   a. The Infrastructure Element identifies alternative and traditional water supply projects, and conservation and reuse programs necessary to meet the projected water demands identified within the local government's jurisdiction; incorporates the alternative water supply project(s) the local government has selected from the regional water supply plan or proposed as an alternative under s. 373.0361(7)(b), F.S.; and includes a minimum 10-year work plan for building public, private, and regional water supply facilities necessary to serve existing and new development.

   b. The Capital Improvements Element addresses the need for and location of public facilities, including those identified in the 10-year water facilities work plan. The financially feasible Five-Year Schedule of Capital Improvements must describe projects listed in the 10-year work plan that are to be implemented in the first five years of the plan, including both publicly and privately funded water supply projects that are necessary to ensure that adopted level-of-service standards are achieved and maintained. [s. 163.3177(3)(a)5., F.S.]

   c. The Conservation Element includes an assessment of current and projected water needs and sources for a minimum 10-year period, considering the appropriate regional water supply plan and consumptive use permit. If the established planning period of the comprehensive plan is greater than ten years, the assessment must address the water supply needs and sources *for the longer planning period.*

   d. The Intergovernmental Coordination Element addresses coordination of the comprehensive plan with the applicable regional water supply plan(s) and regional water supply authorities' plans.

   For local governments that lie within more than one water management district, the due date for adopting the amendments is 18 months from the approval date of the last regional water supply plan (or update) applicable to the local government.

   See Attachment A for a map depicting areas that are subject to regional water supply plans. Attachment B identifies the dates by which amendments to local comprehensive plans must be adopted to incorporate the 10-year water supply facilities work plans. See Attachment C for an overview of regional water supply plans.

3. **Local governments that are *not* subject to a regional water supply plan** (*see* Attachment A) must address the following in their next Evaluation and Appraisal Reports (EARs) and adopt the necessary EAR-based amendments to ensure that:

a. The Conservation Element identifies the current and projected water needs and sources for a minimum 10-year period, considering the appropriate district water management plan, consumptive use permit and associated water supply assessment reports. If the established planning period of a comprehensive plan is greater than ten years, the assessment must address the water supply needs and sources *for the longer planning period.*

b. The Intergovernmental Coordination Element addresses coordination with regional water supply authorities, where the local government is served by a regional water supply authority.

See Section F for additional information about addressing water supply issues in Evaluation and Appraisal Reports.

D. PREPARING THE WORK PLAN

1. **Work Plan Objective:** Local governments *subject to a regional water supply plan* must prepare a minimum 10-year work plan for building public, private, and regional water supply facilities to serve existing and new development within the local government's jurisdiction and adopt the work plan into the comprehensive plan within 18 months after the water management district approves a regional water supply plan or its update. The work plan and the comprehensive plan amendment must address the development of traditional and alternative water supplies, bulk sales agreements, and conservation and reuse programs that are necessary to serve existing and new development for at least a 10-year planning period. In areas where local governments rely on regional water supply authorities or other public or private water suppliers to provide all or a portion of the community's water supply, the work plan must contain information about the provider's water supply and infrastructure plans and the local government's own water supply and infrastructure needs (*i.e.,* address each utility that provides water and infrastructure within the local government's jurisdiction).

2. **Adoption Deadlines:** Each local government must determine the date by which its work plan and comprehensive plan amendment must be adopted (*see* Section C and Attachment B of this Guide). The local government must then determine the date by which it must transmit the *proposed* work plan and plan amendment in order to adopt the final work plan and amendment by the scheduled due date. The work plan amendment is exempt from the twice-per-year amendment limitation. [s.163.3177(6)(c), F.S.]

3. **Coordination with Water Management Districts:** When preparing the work plan, the local government should coordinate with the water management district regarding population and water supply demand projections, areas to be served, the use of traditional and alternative water supplies, bulk sales agreements, and water conservation and reuse strategies necessary to meet projected demand. Local governments must base their population projections on the mid-range population projections prepared by the University of Florida, Bureau of Economic and Busi-

ness Research, unless the local government has been specifically approved by the Department of Community Affairs to use an alternative professionally approved methodology. Projections of water demand must be based upon a professionally accepted and applied methodology.

The local government should identify one person at the water management district as a point-of-contact for information and assistance. A single point-of-contact will greatly facilitate coordination between the local government and the district. Close coordination between the parties can help avoid questions or concerns that could otherwise surface when the district reviews the proposed work plan and the comprehensive plan amendment.

Districts' regional water supply plans are prepared for 20-year planning horizons and include water use demand projections for 5-year increments, such as 2010, 2015, 2020, and 2025. In developing the work plan, the local government should consult with the appropriate water management district(s) to determine the feasibility of using compatible planning increments to facilitate the sharing of consistent data.

4. **Coordination with Water Suppliers:** In addition to coordinating with the water management district, each local government should also work closely with local water utilities that supply water to the community. This could be a city or county water department, the water utility of another local government, a private water supplier, a regional water supply authority or some combination thereof. After identifying the water supplier(s) that serve the community, the local government should request the designation of a single point-of-contact to assist with preparation of the work plan amendment.

   Section 163.3177(6)(c), F.S., encourages local governments, public and private utilities, regional water supply authorities, special districts, and water management districts to cooperatively plan for multijurisdictional water supply facilities, including the development of alternative water sources to supplement traditional sources of ground and surface water. Planning for the use of multijurisdictional water supply facilities on a countywide or multi-county basis is recommended, especially for the development of alternative water supply sources. Cooperative water supply planning can avoid non-productive competition for limited water resources and conflicts over future service areas; promote equitable cost-sharing in the development of alternative water supply projects; and promote water reuse programs between local governments.

   Many small developments, such as trailer parks and condominiums, are self-supplied or serviced by small public supply systems. These small utilities should be inventoried and reported in the data and analysis submitted with the proposed work plan, but need not be considered part of the local government's 10-year water supply work plan due to their limited development potential.

5. **Define Extent of Responsibility:** Each local government should determine the

10-35
10-352

Attach 2

extent to which it plans to be involved in the planning, financing, construction and operation of the water supply facilities that will serve the community, whether the facilities will be provided by a local government utility, a regional water supply authority, or another public or private water supplier. Local government involvement can range from none to total control of the withdrawal, treatment and distribution of potable water and reclaimed water. The local government must address all of the water supply, treatment, distribution facilities, and bulk sales agreements that are planned by all entities providing service within its jurisdiction, regardless of ownership or responsibility for the individual facilities. It must also address any infrastructure or water supply, including bulk sales, that it will provide outside its own jurisdiction and any current and future water conservation activities.

BSU a ✓ b ✓ c ✓ d ✓ e ✓

6. **Information to Obtain from Water Suppliers:** The following information should be obtained from all water suppliers serving the local government:

FGUA a ✓ b ✓ c ✓ d ✓ e ✓

   a. The current consumptive use permit (CUP) number, authorized average and maximum daily water withdrawals under the CUP by source, any applicable source limitations, required alternative water supply projects and/or conservation and reuse projects, and the CUP expiration date for the listed sources, as well as water supply commitments made through bulk sales agreements.

Gasparilla Island a ✓ b ✓ c ✓ d ✓ e ✓

   b. Projected demand for each applicable water use category for at least a 10-year planning period. The local government's projected demand, the water suppliers' projected demand, and the water management district's projections for areas served should be in agreement.

   c. A map that shows existing and future areas to be served by each water supplier.

Greater Pine Island a ✓ b ✓ c ✓ d ✓ e ✓

   d. Identification of existing and planned future water sources. The source(s) of water identified by each supplier should correlate with those described in the regional water supply plan, including the alternative water supply projects to be implemented. Each local government should coordinate with the water management district regarding the ability of the water supplier to meet the projected need, particularly with respect to water sources, source limitations, and the use of appropriate water conservation and reuse strategies.

Island Water a ✓ b ✓ c ✓ d ✓ e ✓

   e. Identification of water supply facilities needed to serve the agreed-upon projected need.

   f. If another local government is a water supplier, verify that its 10-year work plan identifies the sources and facilities needed to meet the recipient government's projected needs – in addition to the supplier's other water supply commitments – for the area served.

7. **Information to Include in the Work Plan:** The work plan should be a planning document based upon information relevant to each local government's unique circumstances. The recommended format and level of detail for the work plan should be similar to the Potable Water, Sanitary Sewer, Solid Waste, and Stormwater Management Sub-Elements that currently comprise the local government's Infrastructure Element. Data and analysis; goals, objectives, and policies; and a financially feasible five-year schedule of capital improvements should be included. The work plan should address the following water supply and water supply facility issues:

   - Water supply projections for at least the next 10 years; if the comprehensive plan has a longer planning horizon, projections should cover that time frame;

   - An assessment of the traditional (current) water sources and whether they will be adequate to meet the projected demand;

   - If alternative water sources will be needed to meet projected demand, coordination with the water management district to identify and include the alternative water supply projects the local government will implement;

   - An identification of the water conservation and reuse programs that the local government will expand or implement and a determination of how much of the future water demand will be offset by those programs;

   - A determination of when alternative water supply projects, water conservation and reuse programs will be implemented and how much they will cost;

   - An identification of the capital improvements projects to be implemented in the first five years of the plan, including both publicly and privately funded water supply projects necessary to achieve and maintain adopted level-of-service standards, and a financially feasible Five-Year Schedule of Capital Improvements. The financial feasibility of privately funded projects must be demonstrated by enforceable development or interlocal agreements. The work plan should also include a general description of the water supply projects and infrastructure needs for the long-term planning time frame;

   - If the local government relies on a service provider, a demonstration (by data and analysis) that the local government has coordinated with the service provider to ensure that its short- and long-term water supply needs will be met (*i.e.,* reserved capacity, CUP allocations, source limitations, bulk sales, interlocal agreements, timing of capital improvements, periodic updates, and concurrency coordination); and

   - An identification of the goals, objectives, and policies that will be needed to implement the work plan and water supply concurrency requirements.

To address the water supply and water supply facility issues described above, the work plan should include the following specific information:

a. **Data and Analysis**

(1) An inventory of all potable and reuse water service providers within the jurisdiction of the local government, including small public supply systems, reuse providers, and significant non-potable (*e.g.,* commercial and industrial users, golf courses, etc.) water service providers. Describe the extent to which the local government is (or plans to be) involved in the planning, financing, construction or operation of the facilities that will supply water within its jurisdiction, even if the facilities will be provided by regional water supply authorities or other public or private water suppliers. The local government's involvement can range from none to total responsibility for the withdrawal, treatment and distribution of potable water and reuse water.

(2) Geographic service area maps for the potable and reuse water service providers and indications of whether the areas depicted are different from the actual area(s) currently served. Composite maps of potable and reuse service providers should be provided, if possible. Self-supplied and similar small public supply systems can be shown as points, if necessary. To evaluate areas for future water service expansion and reuse, indicate where private wells and septic systems are used and will continue to be used.

(3) The term "water supply facilities" includes all infrastructure necessary to withdraw water from its source and to transport, treat and distribute the water, together with any associated storage facilities. For each potable water service area, other than those of the self-supplied and similar small public supply systems, identify the existing facilities, including the general location of existing and planned water wells and intake points from surface water sources, treatment and storage facilities, and distribution mains. For each reuse service area, identify treatment and storage facilities and distribution mains.

(4) Information on the design capacity of the production and treatment facilities, the current demand on the facilities, the geographic area served, and relevant consumptive use permit conditions and duration. If the local government is not responsible for all the listed water supply facilities, identify the responsible entities by service area and describe existing and proposed agreements for any aspect of potable or reuse water service delivery, including agreements with other local governments, public and private utilities, regional water supply authorities, special districts, and water management districts.

(5) An identification of conservation and reuse practices and regulations, including those that apply only to particular service areas.

(6) A determination of future needs for each service area, other than those of the self-supplied and similar small public supply systems. Provide the following information for the base planning year and for the next 5-year and 10-year increments, plus any additional increments necessary to cover the entire planning period established in the comprehensive plan:

(a) Population and water demand projection figures for all water use categories, comparable to those used in the development of the applicable regional water supply plan, for that portion of its jurisdiction located in the service area.

(b) A facility capacity analysis noting capacity surpluses and deficiencies and consumptive use allocations for each facility, and including relevant information for each facility, such as capacity in average daily flow and maximum daily flow, and relationship to permitted flows, treatment and distribution losses, and current commitments for water supply.

The following tables illustrate a convenient format for comparing projected demand, facility capacity and permit conditions. Table 1 reveals the need to increase permitted withdrawals to accommodate anticipated growth and system expansion. Table 2 shows one way to portray a situation where the permitted allocation is unlikely to be expanded due to source limitations and a deficit is avoided by planning to purchase raw water from an adjacent supplier.

Please note that additional information relevant to each local government's situation may need to be included in the calculations, such as bulk sales, treatment and distribution losses, and currently committed water supplies.

TABLE 1

	2005	2008	2010	2015
Population Served	1,722	3,073	3,598	3,955
Avg. Daily Demand (GPD)	268,632	479,388	546,896	593,250
Demand per Capita (GPD)	156	156	152	150
Available Facility Capacity (GPD)	350,000	700,000	700,000	700,000
Facility Capacity Surplus (Deficit)[1]	81,368	220,612	153,104	106,750
Permitted Amount (GPD Annual Avg.)	300,000	300,000	300,000	300,000
Permitted Surplus (Deficit)[2]	31,368	(179,388)	(246,896)	(293,250)
GPD = Gallons Per Day				
[1] Calculated by subtracting Average Daily Demand from Available Facility Capacity				
[2] Calculated by subtracting Average Daily Demand from Permitted Amount				

TABLE 2

	2005	2008	2010	2015
Population Served	21,935	28,733	29,867	32,828
Avg. Daily Demand (MGD)	3.40	4.31	4.48	4.76
Demand per Capita (GPD)	155	150	150	145
Available Facility Capacity (MGD)	8.712	9.360	9.360	10.152
Facility Capacity Surplus (Deficit)[3]	5.312	5.05	4.88	5.392
Permitted Amount (MGD Annual Avg.)	3.46[1]	5.88[2]	5.88[2]	5.88[2]
Permitted Surplus (Deficit)[4]	0.06	1.57	1.40	1.12

MGD=Million Gallons Per Day; GPD=Gallons Per Day
[1]CUP for 3.46 MGD annual average expires September 2006
[2]Includes CUP for 3.46 MGD and 2.42 MGD wholesale purchase from XYZ Utility
[3]Calculated by subtracting Average Daily Demand from Available Facility Capacity
[4]Calculated by subtracting Average Daily Demand from Permitted Amount

(c) Identification of potable and reuse water supply sources and facilities needed to serve projected growth and development, including relevant information for each facility, such as capacity and consumptive use allocations in average daily flow and maximum daily flow. Include any reuse, conservation, traditional, or alternative water supply projects, and conservation and reuse measures, selected from the regional water supply plan or stipulated in the CUP. Provide general planning-level detail for projects proposed as alternatives to the projects identified in the regional water supply plan. Identify the amount and timing of water supply expected to be produced by each project.

(d) Identification of current and prospective conservation and reuse practices and regulations that will be utilized to meet projected demand. Identify those that apply jurisdiction-wide and those that apply only to particular service areas or specific water users. Provide an estimate of the reduction in water use attributable to conservation and reuse allowed as an offset in the CUP.

(e) Identification of current or prospective participation in any county-wide or other multijurisdictional planning initiatives to meet future water supply needs, including the development of alternative water supplies.

(f) Facilities maps showing the location of water sources (wells and surface waters), storage facilities (in-ground and above-ground), and the extent of the distribution system. The maps should be at a scale and level of detail appropriate to the local government's situation. For example, it would be impractical to depict the smallest lines serving individual customers in a county. For a small city, however, that information may be readily available and easily displayed. Maps depicting the location of water distribution mains should be included.

b. **Capital Improvements**

(1) The work plan's data and analysis should identify and discuss the capital improvements required to build all public, private, and regional water supply facilities to serve the existing and new development within the local government, even if the local government is not responsible for the improvements. If a local government is a service provider, the data and analysis should identify the capital improvements that will be needed to serve existing and planned development within the utility's service area.

(2) All capital improvements that will be provided by a water supplier other than the recipient local government should be identified in the data and analysis, but only those publicly and privately funded projects necessary to serve development in the next five years must be included in the recipient local government's Five-Year Schedule of Capital Improvements.

(3) A local government that is a water supply provider will need to identify (in its financially feasible Five-Year Schedule of Capital Improvements) the capital improvements for water supply projects and other water supply infrastructure needed in the next five years. Funding provided through an interlocal agreement, or by private contributions through an enforceable development agreement, must be referenced in the schedule of capital improvements to demonstrate financial feasibility. Interlocal and development agreements should address the cost of the capital improvement, the funding source, the entity responsible for funding and constructing the improvement, the populations to be served, and the construction time line.

Privately funded projects must also be included in the schedule if the local government intends to rely on those projects to achieve and maintain adopted level-of-service standards when approving new development.

To demonstrate financial feasibility, committed funding sources must be identified for the first three years of the Five-Year Schedule of Capital Improvements. Committed or planned revenue sources can be identified for years four and five. If the local government intends to use planned revenue sources that require referenda or other actions to secure the revenue source, the plan must (in the event the referenda are not passed or required actions do not occur) identify other existing revenue sources that will be used to fund the capital projects or otherwise amend the schedule to ensure financial feasibility [see Sections 163.3164(32) and 163.3177(3)(a)5, F.S.].

(4) Local governments do not need to demonstrate that funding is currently available or will be available through planned revenue sources to address water supply projects needed *beyond* the Five-Year Schedule of Capital Improvements. Instead, strategies should be included in the comprehensive plan policies that identify the funding programs that the local government intends to utilize to address those future needs. The programs may include a plan for new funding sources.

(5) For more information about capital improvements planning, interested readers are referred to the Department's technical assistance report, *A Guide to the Annual Update of the Capital Improvements Element.* The report is available from the Division of Community Planning and posted on the Department's website (www.dca.state.fl.us).

c. **Goals, Objectives, and Policies**

Local governments should review their comprehensive plans to identify the goals, objectives and policies (GOPs) that address water supply sources and facilities, as well as conservation and reuse programs. Typically, these GOPs will be located in the following plan elements: Future Land Use, Infrastructure (particularly the Potable Water and Sanitary Sewer Sub-Elements), Conservation, Capital Improvements, and Intergovernmental Coordination.

The work plan should include an assessment of current GOPs and identify any new or revised GOPs needed to implement the work plan. The following list of issue areas where new or revised GOPs may be appropriate is based on the comprehensive plan requirements in Chapter 9J-5, Florida Administrative Code (F.A.C.). The list is provided as an example of issues that may need to be considered. Each local government will need to develop its own list of issues to be addressed through new or revised GOPs, based on the work plan and its supporting data and analysis.

(1) Coordination of land uses and future land use changes with the availability of water supplies and water supply facilities;

(2) Revision of potable water level-of-service standards for residential and non-residential users;

(3) Provision for the protection of water quality in the traditional and new alternative water supply sources;

(4) Revision of priorities for the replacement of facilities, correction of existing water supply and facility deficiencies, and provision for future water supply and facility needs;

(5) Provision for conserving potable water resources, including the implementation of reuse programs and potable water conservation strategies and techniques;

(6) Provisions for improved or additional coordination between a water supply provider and the recipient local government concerning the sharing and updating of information to meet ongoing water supply needs;

(7) Coordination between local governments and the water supply provider in the implementation of alternative water supply projects, establishment of level-of-service standards and resource allocations, changes in service areas, and potential for annexation;

(8) Coordination of land uses with available and projected fiscal resources and a financially feasible schedule of capital improvements for water supply and facility projects; and

(9) The need for additional revenue sources to fund water supply and facility projects.

8. Adopting the Work Plan Into the Comprehensive Plan

As described in Section 7 above, the format of the work plan is like that of a "sub-element," similar to the Potable Water and Sanitary Sewer Sub-Elements included in the Infrastructure Element of most local comprehensive plans. The sub-element format – with its data and analysis, list of capital improvements, and GOPs incorporated as sub-sections within the Infrastructure Element – is the recommended format for the work plan. A five-year schedule of capital improvements for water supply and infrastructure projects could be adopted as part of the Infrastructure Element, or those projects could be included in the Capital Improvements Element's Five-Year Schedule of Capital Improvements.

Other alternatives for incorporating the work plan into the comprehensive plan include:

a. Incorporating the work plan as a set of GOPs, exhibits or attachments in the Infrastructure Element and making related GOP changes in other elements, with a five-year schedule of capital improvements either as part of the Infrastructure Element or incorporated in the Five-Year Schedule of Capital Improvements located in the Capital Improvements Element;

b. Including the work plan data and analysis, GOPs, and five-year schedule of capital improvements in the various elements of the comprehensive plan (*e.g.*, Future Land Use, Infrastructure, Conservation, Coastal Management, Inter-governmental Coordination, and Capital Improvements Elements). If this option is utilized, the local government should identify where the various portions of the work plan are located in the comprehensive plan; or

c. Adopting the work plan by reference in a policy of the Infrastructure Element. This option is not recommended, however, because the comprehensive plan would have to be amended each time the work plan is revised, including any revision to sections that would not otherwise require an amendment to the comprehensive plan.

No dev would be approved applicable. W/ not exceed Unit 4 Plant 1 capacity max capacity

E. ADDITIONAL AMENDMENTS TO THE COMPREHENSIVE PLAN

All local governments must revise their comprehensive plans to address water supply concurrency and to ensure their Five-Year Schedules of Capital Improvements are financially feasible. In 2005, s. 163.3180(2)(a), F.S., was amended to add water supply as a concurrency requirement. The 2005 legislation also revised s.163.3177(6)(a), F.S., to require the future land use plan be based on the availability of water supplies and public facilities, and added a definition of "financial feasibility" [s.163.3164(32), F.S.]. The following section provides guidance for addressing requirements associated with concurrency and the financial feasibility of the Five-Year Schedule of Capital Improvements. See Paragraphs B.2. and C.1. for requirements associated with changes to the Future Land Use Element.

1. **Water Supply Concurrency:** The local government's concurrency management system will require revision to formalize the consultative process between the local government and the water supplier. The GOPs that establish the local government's concurrency management system and the land development regulations that implement the concurrency management system could, for example, be revised to require the local permitting entity to request and obtain from the water supplier a written statement regarding the availability of water to serve a proposed project. Such a statement should clearly identify the available water supply for all existing and proposed water demands, consistent with the supplier's consumptive use permit and the applicable regional water supply plan.

2. **Annual Updates to the Five-Year Schedule of Capital Improvements:** All local governments must annually update their Five-Year Schedules of Capital Improvements to maintain financial feasibility. Annual updates should include water supply development projects for which the local government is responsible, including reuse facilities and the development of any alternative water supply projects; new potable water facilities and upgrades; and all other publicly and privately funded capital improvement projects needed to achieve and maintain adopted level-of-service standards for the next five years. For any privately funded project that will be paid for through individual developer contributions, an executed (and enforceable) agreement must be provided as data and analysis and referenced in the Five-Year Schedule of Capital Improvements to demonstrate that financial feasibility requirements have been met. An amendment to the comprehensive plan is required to update the schedule on an annual basis or to eliminate, defer, or delay the construction of any facility listed in the five-year schedule.

F. EVALUATION AND APPRAISAL REPORTS

under 9J 1.3 or 33

All local governments, including those within the Suwannee River Water Management District, must address water supply planning in the Evaluation and Appraisal Report (EAR) process and subsequently adopt amendments based on the EAR findings. In addition, local governments subject to a regional water supply plan must also address the extent to which they have implemented their 10-year water supply facilities work

No development order will be approved, applicable facility, not exceeding water supply based on CUP.

plans and identified water supply projects necessary to address the water needs identified in the applicable regional water supply plan. The two sets of requirements are described below. For additional guidance regarding EAR requirements, please see the Department's website at http://www.dca.state.fl.us/fdcp/dcp/EAR/index.cfm.

1. In the EAR process, local governments that are not subject to a regional water supply plan, including those in the Suwannee River Water Management District, must:

   a. Update the comprehensive plan to identify the capital improvement projects needed within the next five years and within the minimum ten-year planning horizon to ensure the availability of potable water supplies and infrastructure to meet the anticipated residential and non-residential demands for those two planning periods. The identification of capital improvements should include the water supply projects, the infrastructure improvements for the treatment and delivery of potable water, and the water conservation and reuse projects to be implemented to meet projected demands. Any capital improvements projects needed in the first five-year period must be included in the financially feasible Five-Year Schedule of Capital Improvements.

   b. Update the Conservation Element to include an assessment of current and projected water needs and sources for at least a ten-year period, considering the applicable District Water Management Plan and consumptive use permit. If the established planning period of a comprehensive plan is greater than ten years, the plan must address the water supply sources necessary to meet and achieve the existing and projected water use demand *for the established planning period*. [s. 163.3167(13), F.S.]

   c. Update the Intergovernmental Coordination Element to address cooperative efforts with other local governments, public and private utilities, regional water supply authorities, special districts, and water management districts with regard to potable and reuse water service delivery. Any local government that relies on a regional water supply authority for its water supply must review this element to determine if coordination with the regional water supply authority has been addressed. If not, the comprehensive plan must be revised to address this requirement. The requirements for data and analysis and goals, objectives, and policies outlined in Rule 9J-5.015, F.A.C., for the preparation of the Intergovernmental Coordination Element can be used to address this requirement.

2. In the EAR process, local governments that are subject to a regional water supply plan must:

   a. Address items 1.a. through 1.c., above.

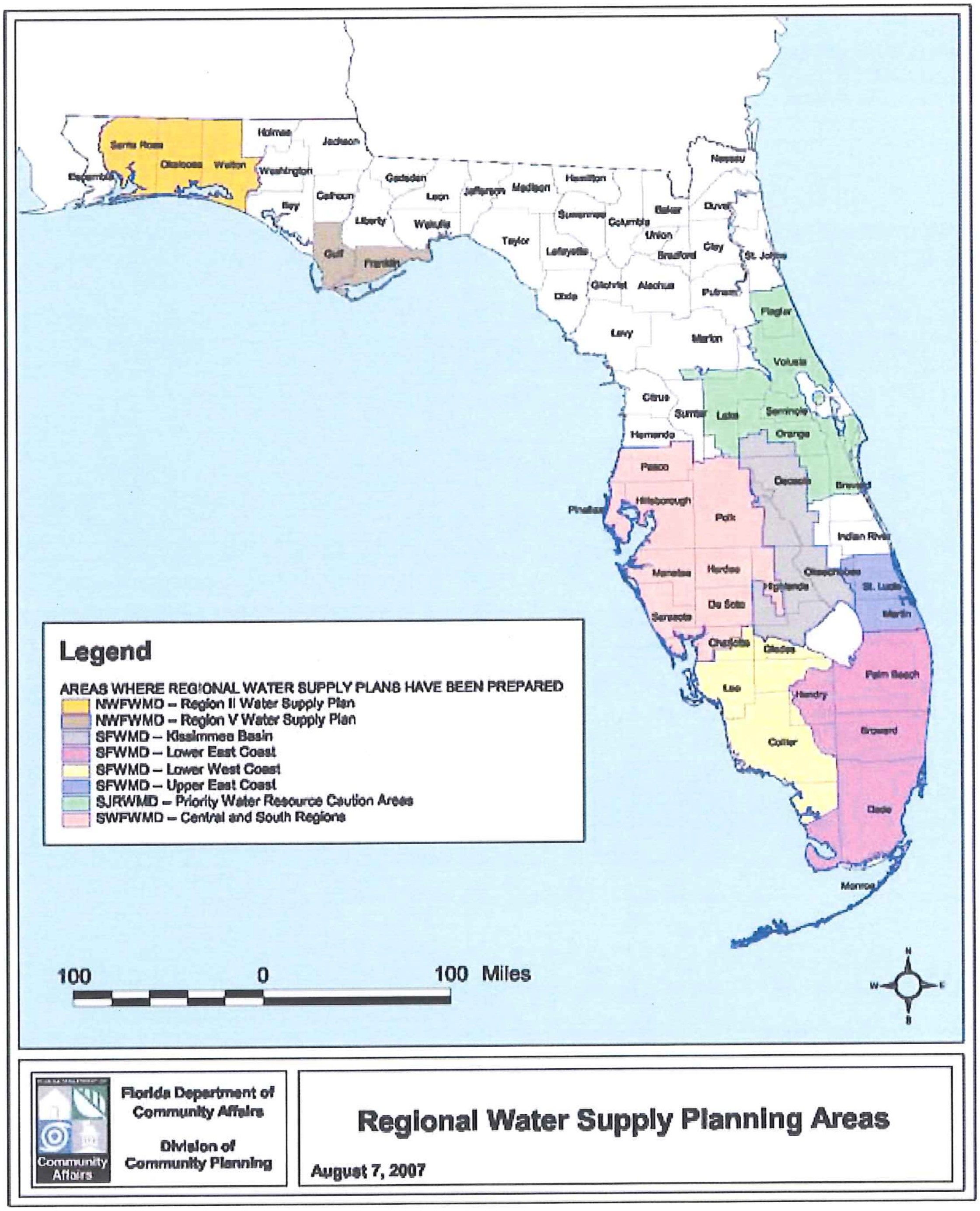
   b. Indicate the extent to which the local government has implemented the work plan for building public, private and regional water supply facilities, including the development of alternative water supplies, to meet local water use needs identified in the Infrastructure Element.

c. Indicate the extent to which the local government has been successful in identifying alternative water supply projects, traditional water supply projects, bulk sales agreements, and conservation and reuse programs to meet the water needs identified in the applicable regional water supply plan.

d. Based on the evaluations described in paragraphs b. and c. above, update the comprehensive plan to include new or revised programs and activities to address any shortcomings in the implementation of the water supply facilities work plan, including the development of alternative water supplies, bulk sales agreements, and the implementation of conservation and reuse programs to meet current and future needs.

ATTACHMENT A

Map of Regional Water Supply Planning Areas



ATTACHMENT B

Due Dates for Work Plan Amendments

1. The following local governments are located in the **Northwest Florida Water Management District**'s Region II Water Supply Planning Area. An update of the area's regional water supply plan was approved by the District's Governing Board on October 26, 2006. The following local governments must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by April 26, 2008 (18 months after the District Governing Board approved the updated regional water supply plan) [s. 163.3177(6)(c), *F.S.*]:

   a. Okaloosa County and all municipalities located in the county

   b. Santa Rosa County and all municipalities located in the county

   c. Walton County and all municipalities located in the county

   The following local governments are located in the **Northwest Florida Water Management District**'s Region V Water Supply Planning Area. A regional water supply plan for Region V was approved by the District's Governing Board on January 25, 2007. The following local governments must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by July 25, 2008 (18 months after the District Governing Board approved the regional water supply plan) [s. 163.3177(6)(c), *F.S.*]:

   d. Franklin County and the municipalities of Apalachicola and Carrabelle

   e. Gulf County and the municipalities of Port St. Joe and Wewahitchka

2. The following local governments are located in the **St. Johns River Water Management District**'s Priority Water Resource Caution Area (PWRCA), a water supply planning region where existing and reasonably anticipated sources of water may not be adequate to supply water for all existing legal uses and anticipated future needs while sustaining water resources and related natural systems. The regional water supply plan for the PWRCA area (District Water Supply Plan 2005) was approved by the District Governing Board on February 7, 2006, and an addendum affecting some local governments was approved on October 10, 2006. The following local governments located within the PWRCA must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by August 7, 2007, except as noted [s. 163.3177(6)(c), *F.S.*]:

   a. Brevard County and the municipalities of Cape Canaveral, Cocoa, Cocoa Beach, Indialantic, Indian Harbour Beach, Melbourne, Melbourne Beach, Melbourne Village, Palm Shores, Rockledge, Satellite Beach and West Melbourne; the municipality of Titusville has a deadline of April 10, 2008.

   b. Flagler County and all municipalities located in the county

c. Lake County and the municipalities of Astatula, Clermont, Eustis, Groveland, Howey-in-the-Hills, Lady Lake, Leesburg, Mascotte, Minneola, Montverde, Mount Dora and Tavares; the municipalities of Fruitland Park and Umatilla have a deadline of April 10, 2008.

d. Marion County (part of the County – but no municipalities – is in the PWRCA) has a deadline of April 10, 2008.

e. Orange County municipalities of Apopka, Belle Isle, Eatonville, Edgewood, Maitland, and Winter Park; the municipality of Oakland has a deadline of April 10, 2008. Note: the unincorporated area of the County and the municipalities of Ocoee, Orlando and Winter Garden are split with the SFWMD – see item 4 below for the applicable deadline).

f. Osceola County is split with SFWMD – see item 4 below for deadline

g. Seminole County and all municipalities located in the county

h. Volusia County and the municipalities of Daytona Beach Shores, DeBary, DeLand, Deltona, Edgewater, Holly Hill, Lake Helen, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange and South Daytona; the municipalities of Daytona Beach and New Smyrna Beach have a deadline of April 10, 2008.

3. The following local governments are located in the **Southwest Florida Water Management District**'s Central and Southern Region, a regional water supply planning area. An updated regional water supply plan for the Central and Southern Region was approved by the District Governing Board on November 30, 2006. The following local governments located in the Central and Southern Region must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by May 30, 2008 (18 months after the District Governing Board approves the updated regional water supply plan) [s. 163.3177(6)(c), *F.S.*]:

   a. Charlotte County and its municipality

   b. DeSoto County and its municipality

   c. Hardee County and all municipalities located in the county

   d. Avon Park, Lake Placid, and Sebring

   e. Hillsborough County and all municipalities located in the county

   f. Manatee County and all municipalities located in the county

   g. Pasco County and all municipalities located in the county

   h. Pinellas County and all municipalities located in the county

   i. All municipalities located in Polk County

   j. Sarasota County and all municipalities located in the county

4. Two of the four regional water supply plans for the **South Florida Water Management District** (the Upper East Coast plan and the Lower West Coast plan) were approved by the District's Governing Board on July 12, 2006. The following local governments located in those planning regions must prepare their 10-year water supply facilities work plans and update their comprehensive plans by January 12, 2008 (18 months after the District Governing Board approved each regional water supply plan) [s. 163.3177(6)(c), *F.S.*]:

   a. Collier County and all municipalities located in the county

   b. Hendry County and all municipalities located in the county

   c. Lee County and all municipalities located in the county

   d. Martin County and all municipalities located in the county

   e. St. Lucie County and all municipalities located in the county

   The regional water supply plan for the Kissimmee Basin was approved by the District's Governing Board on December 14, 2006. The following local governments located in the Kissimmee Basin planning region must prepare their 10-year water supply facilities work plans and update their comprehensive plans by June 14, 2008 (18 months after the District Governing Board approved the regional water supply plan). [s. 163.3177(6)(c), *F.S.*]:

   f. Glades County and its municipality

   g. Highlands County

   h. Okeechobee County and its municipality

   i. Orange County, Bay Lake, Lake Buena Vista, Ocoee, Orlando, Reedy Creek, Windermere, and Winter Garden

   j. Osceola County and all municipalities located in the county

   k. Polk County

   The regional water supply plan for the Lower East Coast was approved by the District's Governing Board on February 15, 2007. The following local governments located in the Lower East Coast planning region must prepare their 10-year water supply facilities work plans and update their comprehensive plans by August 15, 2008 (18 months after the District Governing Board approved the regional water supply plan). [s. 163.3177(6)(c), *F.S.*]:

   n. Broward County and all municipalities located in the county

   o. Miami-Dade County and all municipalities located in the county

   p. Monroe County and all municipalities located in the county

   q. Palm Beach County and all municipalities located in the county

ATTACHMENT C

Overview of Regional Water Supply Plans

The following briefly summarizes the content and application of regional water supply plans (RWSPs) and describes the types of information and assistance that are available from the water management districts. The map in Attachment A depicts the areas of the state for which RWSPs have been prepared.

A RWSP includes a 20-year projection of future population and associated water supply demands, as well as an identification of water supply projects that could meet those demands. The RWSP is intended to provide the framework for future water supply decisions in areas where existing and reasonably anticipated sources of water and conservation efforts may not be adequate to provide for all existing legal users and reasonably anticipated future needs, while sustaining water resources and related natural systems.

For planning purposes, water use is separated into six categories: agriculture; public supply; domestic self-supply (including small public supply systems); commercial/industrial and mining/dewatering; thermoelectric power production; and recreational irrigation. The RWSP identifies potential sources of water capable of meeting projected demand and options for developing those sources. Typical sources include (1) new groundwater wellfields; (2) increased use of reclaimed water; (3) storage reservoirs; (4) surface water withdrawals; (5) aquifer storage and recovery; (6) reverse osmosis/desalination; and (7) conservation. The RWSP includes planning-level analyses for each of these potential sources of water to quantify available water supplies, identify project development options, and estimate costs associated with water supply development.

The RWSP identifies potential water supply development projects, including conservation, reuse, traditional, and alternative water supply projects that will exceed the needs projected by the district. The RWSP also estimates the associated costs for developing the projects. The water supply projects identified in the RWSP represent a "menu" of possible options from which each identified local government, government-owned and privately owned utility, self-supplier or other entity may choose to address its water supply needs. The individualized project options are provided as reasonable concepts that water users in the region can pursue through water supply planning. Water users may also propose specific alternative water supply projects for inclusion in the regional water supply plan. If the water management district determines that the proposed projects meet the goals of the plan, they will be included in the approved regional water supply plan. Additionally, the plan provides information to assist water users in developing funding strategies to construct water supply development projects, and the inclusion of a specific *alternative* water supply project in the plan indicates that state and water management district funding assistance may be available for the project.

Each RWSP is to be updated at least every five years. Local governments should consult with their respective districts to obtain the latest and most detailed information available.

ATTACHMENT D

Sources of Information and Contacts

Data and Information Sources:

1. Water Management District publications, such as Regional Water Supply Plans, water supply assessments, and District Water Management Plans.

2. Monthly Public Supply Water Withdrawal tables, available from the USGS. Contact Richard Marella at (850) 942-9500, for Northwest Florida WMD, Suwannee River WMD and South Florida WMD. Contact St. Johns River WMD and Southwest Florida WMD for similar tables.

3. Regional Water Supply Authority plans and publications.

4. Comprehensive plans of adjacent local governments if they supply water to portions of your jurisdiction.

5. Plans or other documents from public or private utilities serving areas within your jurisdiction.

Agency and District Contacts:

Florida Department of Community Affairs

Vicki Morrison, Principal Planner
(850) 921-3775; Suncom 291-3775
E-mail: vicki.morrison@dca.state.fl.us

Website: www.dca.state.fl.us

Florida Department of Environmental Protection

Janet Llewellyn, Director
Division of Water Resources Management
(850) 245-8676; Suncom 205-8676
E-mail: janet.llewellyn@dep.state.fl.us

Website: www.dep.state.fl.us

Northwest Florida Water Management District

Paul Thorpe, AICP, Director, Resource Planning Section
(850) 539-5999; (800) 913-1518, ext. 254
E-mail: paul.thorpe@nwfwmd.state.fl.us

Website: www.nwfwmd.state.fl.us

St. Johns River Water Management District

Peter Brown, Policy Analyst
(386) 329-4311; (800) 451-7106
E-mail: pbrown@sjrwmd.com

Website: www.sjrwmd.com

Suwannee River Water Management District

David Still, Deputy Executive Director
(386) 362-1001 or (800) 226-1066
E-mail: still_d@srwmd.state.fl.us

Steven Minnis, Senior Resource Development Coordinator
(386) 362-1001 or (800) 226-1066
E-mail: minnis_s@srwmd.state.fl.us

Website: www.srwmd.state.fl.us

Southwest Florida Water Management District

Rand Frahm, AICP, Planning Manager
(352) 796-7211 or (800) 423-1476, ext. 4411
E-mail: Rand.Frahm@watermatters.org

Miki Renner, AICP, Planning Manager
(352) 796-7211 or (800) 423-1476, ext. 4413
E-mail: Miki.Renner@watermaters.org

Website: www.watermatters.org

South Florida Water Management District

Jim Jackson, AICP, Senior Supervising Planner
(561) 682-6334; (800) 432-2045, ext. 6334; Suncom 229-6334
E-mail: jjackson@sfwmd.gov

Jane Bucca, Alternative Water Supply Program Manager
(561) 682-6791; (800) 432-2045, ext. 6791; Suncom 229-6791
E-mail: jbucca@sfwmd.gov

Henry Bittaker, AICP, Senior Planner
Comprehensive Planning Issues
(561) 682-6792; (800) 432-2045, ext. 6792; Suncom 229-6792
E-mail: hbittak@sfwmd.gov

Website: www.sfwmd.gov

Lower East Coast Regional Water Supply Plan

Barbara Powell, AICP, Plan Manager
(561) 682-2236 or (800) 432-2045, ext. 2236
E-mail: bpowell@sfwmd.gov

Kissimmee Basin Regional Water Supply Plan

Chris Sweazy, Plan Manager
(407) 858-6100 or (800) 432-2045, ext. 3822
E-mail: csweazy@sfwmd.gov

Upper East Coast Regional Water Supply Plan

Linda Hoppes, Plan Manager
(561) 682-2213 or (800) 432-2045, ext. 2213
E-mail: lhoppes@sfwmd.gov

Lower West Coast Regional Water Supply Plan

Terry Bengtsson, Regional Coordinator
(239) 338-2929 or (800) 432-2045, ext. 7740
E-mail: tbengts@sfwmd.gov

Regional Water Supply Authorities

Peace River/Manasota Regional Water Supply Authority
(Charlotte, DeSoto, Manatee and Sarasota Counties)

Patrick J. Lehman, Executive Director
(941) 316-1776
E-mail: peacemana@aol.com
Website: www.regionalwater.org

Tampa Bay Water
(Hillsborough, Pasco, and Pinellas Counties and the Cities of New Port Richey, Tampa and St. Petersburg)

Paula Dye, AICP, Chief Environmental Planner
(727) 796-2355
E-mail: pdye@tampabaywater.org
Website: www.tampabaywater.org

Walton/Okaloosa/Santa Rosa Regional Utility Authority
(Okaloosa, Santa Rosa and Walton Counties)

Terry A. Joseph, Executive Director
(850) 595-8910
E-mail: josepht@wfrpc.dst.fl.us
Website: www.wfrpc.dst.fl.us

Withlacoochee Regional Water Supply Authority
(Citrus, Hernando, and Sumter Counties and all municipalities in those Counties, and the City of Ocala)

Jackson E. Sullivan, Executive Director
(850) 385-0220
E-mail: jsullivan@carltonfields.com
Website: www.wrwsa.cc

AGENCY COORDINATION OF COMPREHENSIVE PLANNING AND WATER SUPPLY PLANNING IN FLORIDA

Department of Community Affairs
Department of Environmental Protection
Water Management Districts

October 2007

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APPENDICES

I. Introduction

In 2002, the Florida Departments of Community Affairs (DCA) and Environmental Protection (DEP) and the state's water management districts (WMDs or districts)* examined the Agencies' statutory and regulatory authorities, as well as their processes for providing technical assistance to local governments, to determine whether water supply planning and local government comprehensive planning could be better integrated. The result of the original assessment, published in November 2002, was a guide entitled *Agency Coordination of Comprehensive Planning and Water Supply Planning in Florida.* In that guide, the Agencies noted the following conclusions:

- A commitment by DCA and the WMDs to actively pursue cooperative interagency training, outreach and technical assistance to local governments, and the Agencies' review of comprehensive plan amendments and evaluation and appraisal reports are critical to achieving the desired integration.

- Water management districts' completion of regional water supply plans provides a significant opportunity to effectuate improved integration.

- Adequate statutory and rule authority exists to support improved integration of comprehensive planning and water supply planning by the Agencies.

In 2005, the Florida Legislature made significant changes to Chapters 163, Part II, and 373, Florida Statutes (F.S.), to improve the coordination of water supply planning and land use planning. The legislation strengthened the statutory linkage between the regional water supply plans prepared by the WMDs and the comprehensive plans, plan amendments and evaluation and appraisal reports (EARs) prepared by local governments.

As a result of the 2005 legislation, the Agencies have reviewed and updated the previous Agency Coordination guide. This revised guide describes and updates the protocols implemented by the Agencies to improve the integration of comprehensive planning and water supply planning through technical assistance and the review of comprehensive plan amendments and EARs. The guide also describes existing responsibilities and authorities of the Agencies related to comprehensive planning and water supply planning.

* DCA, DEP and the WMDs will be collectively referred to as the Agencies

II. Statutory Authority

Although the 1985 Growth Management Act required local governments to address water supply issues in their comprehensive plans, the practical focus of those considerations – prior to the 2005 legislative changes – was often the extent to which adequate infrastructure would be available to serve development within the land uses reflected in the plan. Equal attention was not always given to the question of whether there would be sufficient water supplies from appropriate sources to meet future development needs. Current statutory and regulatory authority can support better coordination and integration of comprehensive land use planning and water supply planning, especially in light of statutory changes made during the 2005 legislative session. Appendix A contains an analysis of current growth management statutes and rules related to water supply. The following is a brief description of statutory changes that led to the current authority of the Agencies to coordinate land use planning and water supply planning.

In 1997, the Florida Legislature amended Chapter 373, F.S., to include a new process for regional water supply planning. The statute requires the WMDs to prepare district-wide water supply assessments to determine whether anticipated sources of water will be sufficient to serve projected future needs. Based on the assessments, the districts developed regional water supply plans (RWSPs) for areas where water supplies were determined inadequate to supply projected demand for the plans' 20-year planning period. The WMDs also provide technical information and assistance to local governments during the development and revision of local plans, and have a responsibility to comment on proposed comprehensive plans, plan amendments and developments of regional impact. The districts' statutory responsibility for water supply planning is briefly discussed in Appendix B.

The 2002 Florida Legislature enacted requirements for the coordination of local comprehensive plans with WMDs' regional water supply plans. Local governments were required to amend their comprehensive plans to better integrate water-related provisions with regional water supply plans. The legislation directed each local government to include in its comprehensive plan's Potable Water Sub-Element, a work plan for building the water supply facilities necessary to serve existing and new development and for which the local government was responsible. The legislation required that the work plan cover at least a 10-year period, and that each local government adopt and transmit the work plan to the DCA by January 1, 2005, or the date by which the local government must submit its next EAR. In 2004, the Legislature further amended Chapter 163, Part II, F.S., to give local governments until December 1, 2006, to prepare the work plans, and to require that comprehensive plans address the water supply sources necessary to meet and achieve the existing and projected water use demand for the established long-range planning period of the comprehensive plan.

In 2005, the Legislature again amended Chapters 163 and 373, F.S., to better describe the coordination necessary between water supply planning and comprehensive planning. Senate Bills 360 and 444[1] encouraged local governments located in areas subject to regional water supply plans to cooperate with the WMDs in the development of alternative water supplies. The legislation also reemphasized the need for local governments to implement water conservation and reuse programs.

[1] Ch. 2005-290 and Ch. 2005-291, respectively, 2005 Fla. Laws.

Each local government located in a regional water supply planning area must now prepare a water supply facilities work plan for a minimum 10-year period, describing the public, private, and regional water supply facilities – and alternative water supply projects, reuse, and conservation – that will be developed to address future water needs. Significant funding was appropriated in 2005 and 2006 to assist local governments and other water suppliers with the development of alternative water supplies.

The 2005 legislation also required local governments to base their future land use plans (the Future Land Use Element and Future Land Use Map) on the availability of adequate water supplies and public facilities, and included requirements for water supply concurrency and intergovernmental coordination between local governments and regional water supply authorities. Future EARs must also include a review of the progress made by the local governments in implementing alternative water supply projects, as well as conservation and reuse projects.

Current statutes and rules (described in Appendices A and B) authorize or direct the districts to provide substantive input during the local government comprehensive planning process and thereby participate in and shape the integration of regional water supply planning with local land use planning. Chapter 163, F.S., provides opportunities for governmental agencies – including DEP and the WMDs – to review local governments' comprehensive plan amendments and EARs and provide DCA with comments and recommendations on provisions related to water supply and public infrastructure. Meaningful integration of comprehensive planning and water supply planning therefore depends on four related factors:

1. The WMDs' implementation of statutory authority to assess and plan for adequate water supplies to serve existing and future demands and its responsibility to provide local governments with technical assistance on water supply issues;

2. Local governments' assessment of their current and future water needs, including the consideration and use of WMD input on water supply issues;

3. The review of comprehensive plan amendments and EARs by the DEP, WMDs and other governmental agencies and the submission of comments to DCA by those agencies; and

4. DCA's assistance to local governments in addressing water supply issues in their comprehensive plans and its facilitation and support of the agencies' review of comprehensive plan amendments and EARs.

III. Water Supply-Related Plan Amendments

A. Overview

Four of the five water management districts have updated their regional water supply plans for portions of their districts. Only the Suwannee River Water Management District has determined that no part of its district requires a regional water supply plan. Each local government in the four water management districts subject to a regional water supply plan must revise certain elements of its comprehensive plan within 18 months after the water management district approves a regional water supply plan or its update. The required revisions include updating the Sanitary

Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Recharge ("Infrastructure") Element to identify alternative water supply project(s) selected from the regional water supply plan, and identifying any other alternative and traditional water supply projects, conservation, and reuse programs necessary to meet projected water demands. Projects that will be implemented in the next five years must be included in a financially feasible Five-Year Schedule of Capital Improvements in the Capital Improvements Element (CIE). Projects to be implemented beyond the Five-Year Schedule must also be addressed in the CIE, but need not be accompanied by a demonstration that they are financially feasible.

For local governments within more than one water management district, the due date for adopting the required plan amendments is 18 months from the approval date of the last regional water supply plan (or update) applicable to the local government. A map showing the regional water supply planning areas and work plan due dates is located in Appendix C.

B. Protocol for Technical Assistance to Local Governments for Development of Water Supply-Related Plan Amendments

The Agencies will continue to assist local governments with the development and preparation of their 10-year water supply facilities work plans and other water supply-related plan amendments by establishing a training program for local governments and other water suppliers, and by developing technical assistance guides describing the work plan and the comprehensive plan elements that must be updated, as well as the data and analysis necessary to support those amendments.

1. During 2005-2006, the Agencies conducted 11 regional workshops for local governments and other water suppliers to explain the changes resulting from the Legislature's passage of Senate Bills 360 and 444. Topics included the districts' updates of regional water supply plans, the 10-year water supply facilities work plans, and other required changes to comprehensive plan elements.

2. In addition to providing technical assistance to local governments upon request, the Agencies have completed the following technical assistance guide for local governments: *A Guide for Local Governments in Preparing Water Supply Comprehensive Plan Amendments and Water Supply Facilities Work Plans,* and is available on the Department's website, http://www.dca.state.fl.us/fdcp/DCP/publications/index.cfm. An additional guide entitled *Recommendations for Preparing Water Supply and Facility Data and Analysis to Support Local Comprehensive Plan Amendments* should be available soon

IV. THE COMPREHENSIVE PLAN AMENDMENT PROCESS

A. Overview

The DCA reviews local government comprehensive plan amendments under the provisions of Chapter 163, Part II, F.S., and Rules 9J-5 and 9J-11, Florida Administrative Code (F.A.C.). Local governments must transmit copies of proposed amendments to DCA, the appropriate regional planning council, WMDs, and the Departments of Environmental Protection, Transportation and State. In addition, municipal amendments must be sent to the county, and county amendments must be provided to the Florida Fish and Wildlife Conservation Commission and the Department of Agriculture and Consumer Services. Amendments related to the Public School Facilities Element also must be submitted to the Office of Education Facilities, Department of Education.

Typically, all proposed comprehensive plan amendments submitted to DCA are reviewed by the Division of Community Planning. Even if a local government does not request review of a proposed amendment, the DCA may still elect to review the amendment. DCA must review a proposed amendment if requested by the submitting local government, the applicable regional planning council, or an affected party. If DCA is weighing whether to initiate review of a proposed amendment, it will consider the advice and recommendations of other reviewing agencies (including the DEP and WMDs) when making that decision. It is therefore critical that the WMDs notify DCA if review of an amendment is needed to address a water supply issue.

A regional planning council or affected person also may request review of a proposed amendment. The request must be received by DCA within 30 days after the local government transmits the proposed amendment to DCA.[2] If the regional planning council referred the amendment to another regional agency for review, the council must provide written comments to DCA specifying any objections, recommendations and comments that the other regional entity may have submitted.[3] "Other regional agencies" could, for example, include the local metropolitan planning organization or the appropriate soil and water conservation district.

Once the DCA has determined that the submitted amendment package is "complete" (i.e., all necessary supporting data and analysis, exhibits and attachments have been submitted), DCA notifies the reviewing agencies – including the DEP and WMDs – of the date by which it must receive the agencies' comments on the amendment (30 days after DCA's receipt of a "complete" amendment package).

If DCA initiates review of a proposed plan amendment or if it is directed by statute to review a submitted amendment, it must issue a report detailing its objections, recommendations and comments (ORC) on the proposed amendment within 60 days after receipt of the complete amendment package.[4] Rule 9J-11.010(2), F.A.C.,[5] directs DCA to consider the comments, objections and recommendations submitted by reviewing agencies when it formulates the ORC report. In addition, DCA must attach to its ORC report "the written responses received from the reviewing agencies"[6] and send a copy of the complete ORC report to the reviewing agencies.

In developing their comments, objections and recommendations on a proposed amendment, the DEP and WMDs review those items related to their statutory responsibilities and those areas required to be addressed in the comprehensive plan by Sections 163.3177 and 163.3178,

[2] FLA. STAT. § 163.3184(6)(a).
[3] FLA. STAT. § 163.3184(4).
[4] FLA. STAT. § 163.3184(6)(c).
[5] Unless otherwise noted, the citation of rules refers to the latest compilation of the Florida Administrative Code.
[6] Rule 9J-11.010(3), *F.A.C.*

F.S., and Rule 9J-5, F.A.C.[7] Those statutes and rules direct local governments to include elements in their comprehensive plans that address potable water supply and facilities, conservation, the use and protection of water, and capital improvements for public facilities.

Upon receipt of DCA's ORC report, the local government may (a) adopt, (b) modify and then adopt, or (c) not adopt the proposed comprehensive plan amendment at a public hearing.[8] The local government must transmit a copy of the adopted amendment to DCA, which then has 45 days to determine whether the amendment is "in compliance" with statutory and regulatory requirements. The plan amendment must be consistent with the state comprehensive plan, the applicable strategic regional policy plan, the requirements of Section 163.3177 (plan elements), Section 163.3178 (coastal management), Section 163.3180 (concurrency), Section 163.3191 (EAR), and Section 163.3245 (sector plans), F.S., Rule 9J-5, F.A.C., and theWekiva Parkway and Protection Act in Chapter 369, Part III, F.S. If DCA reviewed the proposed amendment, its compliance determination for the adopted amendment is limited to the issues raised in its ORC report or any additions or modifications the local government may have made to the proposed amendment prior to adoption. DCA must publish notice of its intent to find the amendment in compliance or not in compliance.

If DCA finds that the amendment is in compliance with statutory and regulatory requirements, an affected person may challenge that determination through the administrative hearing process described in Sections 120.569 and 120.57, F.S. In such a proceeding, the petitioner (the affected party) has the burden of proving that DCA's compliance determination is not fairly debatable. If DCA finds that the amendment is not in compliance, the notice of intent is automatically sent to the Division of Administrative Hearings, which will conduct a hearing under Sections 120.569 and 120.57, F.S. In that proceeding, DCA bears the burden of proving that its non-compliance determination is supported by a preponderance of the evidence.

B. Agency Review of Comprehensive Plan Amendments

The Agencies will review comprehensive plan amendments related to water supply issues in accordance with existing rules that require review and comment by state and regional agencies. The reviews of the WMDs and DEP will focus on the following types of plan amendments to the extent water supply issues are raised:

1. Future land use map changes;

2. EAR-based amendments;

3. Optional sector plans, including the specific area plans;

4. Changes to Future Land Use, Potable Water, Capital Improvements, and Conservation Elements of comprehensive plans, such as changes to potable water level-of-service standards, water sources and supplies, provisions related to wetlands

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7 Rule 9J-11.010(6)(a), F.A.C.

8 FLA. STAT. § 163.3184(7).

and regional water supply planning areas, and aquifer recharge areas and wellfields;

5. Plan amendments that would allow or authorize local governments to regulate the consumptive use of water in violation of Chapter 373, F.S.; and

6. Other amendments affecting water resources of the state.

In their review of water supply-related issues and information in comprehensive plan amendments, the WMDs and DEP will primarily focus on areas of the state depicted as Regional Water Supply Planning Areas in Appendix C. They will screen proposed plan amendments to identify those that raise water supply issues and provide comments to DCA, as appropriate. The districts and DEP will designate contact persons for coordinating the review of proposed and adopted comprehensive plan amendments that affect water supply.

The DEP Office of Intergovernmental Programs (OIP) is responsible for that Department's review of comprehensive plan amendments throughout the state. OIP will coordinate and consult with the applicable WMD when reviewing water supply-related amendments.

DCA will be responsible for coordinating the state and regional review of plan amendments – including those related to water supply – and will conduct the objections, recommendations and comments (ORC) review. DCA will include the WMDs and OIP in its coordination of plan amendment reviews.

Each WMD will provide technical assistance to DCA, DEP and the local government to help resolve disputes arising from water supply-related issues reflected in the ORC Report, to the extent the district was involved in the development of DCA's report. The DEP and WMDs will assist DCA with negotiations and litigation arising from DCA's compliance decisions that relate to water supply, to the extent the DEP or district was involved in development of the decision.

V. Evaluation and Appraisal Reports (EARs)

A. Overview

Every seven years, each local government must adopt an evaluation and appraisal report (EAR) that assesses the progress made in implementing the local comprehensive plan.[9] The evaluation must respond to changes in state, regional and local planning policies; reflect changes made to statutes or rules; analyze existing conditions and evolving trends; ensure effective intergovernmental coordination; and identify major growth management issues within its jurisdiction. The current EAR cycle began with Miami-Dade County in November 2003 and will conclude with Calhoun, Okeechobee, and Sumter Counties in January 2010, with the last of the cities' reports due by November 2011. The current schedule of EAR due dates is posted on the DCA website. The next cycle of EAR submittal dates is expected to begin in November 2010.

[9] Fla. Stat. § 163.3191.

The local government's development of the EAR should include active participation by state agencies, regional agencies, adjacent local governments and the public. The EAR is a summary audit of actions the local government has undertaken to implement its plan, and it identifies changes the local government may need to make. The EAR does not require a comprehensive revision of the elements within the local plan, unless the local government chooses to do so, or unless the EAR identifies where updates to the comprehensive plan are needed.

Section 163.3191(2), F.S., describes the contents of the EAR. Specifically, the report must evaluate and assess the existing comprehensive plan and include appropriate statements to update the plan as it relates to:

1. Population growth and changes in land area;

2. The extent of vacant and undevelopable land;

3. The financial feasibility of providing needed infrastructure to achieve and maintain adopted level of service standards and sustain concurrency through capital improvements, as well as the ability to address infrastructure backlogs and meet the demands of growth on public services and facilities;

4. The location of existing development in relation to the location of development anticipated in the plan, such as areas designated for urban growth;

5. Major issues affecting the local government and, where pertinent, the potential social, economic, and environmental impacts of those issues;

6. Relevant changes in growth management laws (the State Comprehensive Plan, the appropriate strategic regional policy plan, Chapter 163, Part II, F.S., and Rule 9J-5, F.A.C.;

7. The achievement of plan objectives within each element, as they relate to major issues, and whether unforeseen and unanticipated changes in circumstances have resulted in problems or opportunities with respect to major issues in each element;

8. The successes and shortcomings related to each element;

9. Any actions or corrective measures, including whether plan amendments are anticipated, to address the major issues identified and analyzed in the report. Such identification shall include, as appropriate, new population projections, new revised planning time frames, a revised future conditions map or map series, an updated Capital Improvements Element, and any new and revised goals, objectives and policies for the major issues identified within each element;

10. Public participation activities undertaken by the local government in preparing the report;

11. The success or failure of coordinating future land use and residential development with existing school capacity, coordinating local government and school board processes for establishing appropriate population projections, and planning and siting of public school facilities;

12. **The extent to which identified alternative water supply projects, traditional water supply projects, conservation, and reuse have met local water supply needs and the degree to which the local government has implemented the 10-year water supply facilities work plan for building public, private, and regional water supply facilities, including the development of alternative water supplies to serve existing and new development;**

13. Any portion of the local government's jurisdiction located within the coastal high-hazard area, and whether any past reduction in land use density impairs the property rights of current residents when redevelopment occurs, including redevelopment following a natural disaster. The property rights of current residents must be balanced with public safety considerations. The local government must identify strategies to address redevelopment feasibility and the property rights of affected residents. The strategies may include the authorization of redevelopment up to the actual built density in existence on the property prior to the natural disaster or redevelopment;

14. The success of criteria adopted to achieve compatibility with military installations;

15. The extent to which transportation concurrency exception areas, transportation concurrency management areas, and multimodal transportation districts have achieved their intended purposes; and

16. The need to change the methodology for measuring impacts on transportation facilities to implement a concurrency management system coordinated with the municipalities and counties.

A voluntary scoping meeting may be conducted by the local government or several local governments within the same county. If a scoping meeting is held, the local government must invite each state and regional reviewing agency, as well as adjacent and other affected local governments. The purpose of the scoping meeting is to identify or distribute data and resources available to assist the local government in preparing the EAR, provide input on major issues to be addressed in the report, and provide advice on the detail needed to address the EAR requirements summarized in items 1 through 16, above. State and regional agencies should provide the local government with a list of new data available and major issues that have emerged since adoption of the original comprehensive plan or the last EAR update to the comprehensive plan. The scoping meeting must be completed at least one year prior to the established adoption date of the EAR.

Through voluntary scoping meetings and technical assistance (described below), state and regional agencies will advise and assist local governments as they address water supply issues in their EARs and subsequent comprehensive plan updates.

B. Process for Preparing and Adopting the EAR

THE PROPOSED EAR

Ninety days before a local government is scheduled to adopt its EAR, it "may" provide a copy of the *proposed* report to DCA and "regional commenting agencies as prescribed by rule."[10] Rules 9J-11.009(6) and 9J-11.018(2)(d), F.A.C., expressly provide that DEP and WMDs are commenting agencies and that their comments must be filed with DCA and the local government within 30 days after receipt of the proposed EAR. DCA must also provide its comments to the local government within the same 30-day period. Thus, reviewing agencies should prepare and provide comments to DCA within a maximum of 25 days so that DCA has sufficient time to incorporate the comments in its response to the local government.

THE ADOPTED EAR

After considering the comments of DCA and the commenting agencies on the proposed EAR, the local government must then adopt a final report and furnish copies to DCA and the reviewing agencies.[11] Although Chapter 163 provides that reviewing agencies must be furnished copies of the adopted EAR, there is no corresponding statutory requirement for the reviewing agencies to provide comments to DCA on that final report. It will continue to be DCA's practice to ask reviewing agencies (including water management districts and DEP) to review the adopted EAR and provide comments.

Within 60 days after it receives the adopted EAR, the DCA must make a preliminary determination regarding the sufficiency of the EAR, and within 90 days make a final sufficiency determination.[12] DCA's review concentrates on whether the EAR sufficiently fulfills the components of Sections 163.3191(2) and (7), F.S., and Rule 9J-11.018(4), F.A.C. The adopted report must identify "major issues for the jurisdiction and, where pertinent, the potential social, economic, and environmental impacts."[13] Ensuring adequate water supplies for people and the environment qualifies as a "major issue" for local governments located in regional water supply planning areas (see Appendix C).

If DCA determines that the EAR is insufficient, the statute requires the local government to adopt revisions and submit the revised report for additional sufficiency review.[14] Once DCA determines the EAR is sufficient, the local government must amend its comprehensive plan to implement the recommendations contained in the adopted EAR. Section 163.3191(10), F.S., directs the local government to adopt the necessary plan amendments within 18 months of DCA's sufficiency determination. A local government that has not adopted amendments to its comprehensive plan based upon the EAR by the due date is prohibited from amending its

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[10] FLA. STAT. § 163.3191(5).

[11] FLA. STAT. § 163.3191(6) [the local government must furnish a copy of the adopted EAR to the reviewing agencies that provided comments on the proposed report; if the local government did not provide the proposed EAR to reviewing agencies, it <u>must</u> send them a copy of the adopted report].

[12] *Id.*

[13] FLA. STAT. § 163.3191(2)(e).

[14] FLA. STAT. § 163.3191(7).

comprehensive plan until the EAR-based amendments have been adopted and transmitted to DCA.[15] The Administration Commission (Governor and Cabinet) can levy sanctions on any local government that fails to implement its EAR through "timely and sufficient amendments" to its comprehensive plan.[16]

C. Protocol for Technical Assistance to Local Governments for the Development of EARs

The EAR review process affords DEP and WMDs the opportunity to provide technical assistance and comments to local governments on water supply planning issues and to provide substantive comments to DCA on proposed and adopted EARs. DCA has the authority to review proposed and adopted EARs to determine whether local governments have sufficiently addressed the availability of adequate water supplies and facilities for both current and future users within its jurisdiction. Even so, an EAR could be proposed and adopted without review and comment by a WMD or DEP, since the local government is not required to provide proposed EARs to the reviewing agencies and the reviewing agencies are not required to comment on the adopted EAR. If the local government does not provide reviewing agencies with a copy of the proposed EAR, a copy of the adopted EAR must be provided to the reviewing agencies.[17] To assist local governments in the development and preparation of their EARs:

1. The Agencies will prepare for the current and next cycle of EAR submissions by sharing water supply-related information and establishing a training program for DCA and local government planners on the districts' regional water supply plans and other water supply-related issues.

2. DEP and WMDs will identify appropriate data sources and make them available to DCA and local governments for use in the EAR process.[18] Within the Regional Water Supply Planning Areas depicted on Appendix C,[19] the information will characterize water resources, describe major initiatives or issues, and provide summaries of water supply data for each local government, including a breakdown by utility service area to the extent available. The information will inform local governments of anticipated water supply deficiencies for the five-year, 10-year, and 20-year planning periods and identify potential alternative water supply sources and

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15 FLA. STAT. § 163.3191(10).

16 FLA. STAT. § 163.3191(11).

17 FLA. STAT. § 163.3191(6).

18 The WMDs may provide DCA a more specific identification of areas or municipalities within a Regional Water Supply Planning Area where water supply is expected to be a significant issue. The following water-related plans or processes also provide data and information for assimilation or consideration in local governments' preparation of comprehensive plan amendments and EARs: District Water Management Plans (including the associated county-level "Integrated Plans"), Regional Water Supply Plans, and the watershed planning efforts of the WMDs and DEP. The districts have also developed information systems that describe the hydrologic conditions of surface and groundwater sources and suggest conservation alternatives.

19 The Regional Water Supply Planning Areas illustrated in Appendix C depict the most sensitive water supply areas of the state, where potential deficiencies of adequate water supplies have been identified in the regional water supply plans. The Appendix reflects a "snapshot" of water supply-sensitive areas within the state as of September 18, 2006. As conditions change, the areas will be modified appropriately.

projects. Local governments can assimilate the information during preparation of their water supply facilities work plans and EARs and thereafter amend their comprehensive plans accordingly. Maintaining and sharing consistent data on the geographic distribution of water supply sources and water demand projections is a major objective of coordination and technical assistance between the WMDs and local governments.

3. DCA will conduct regional workshops and training sessions for local governments to explain the EAR process and any new requirements and critical data sources to be addressed in the EAR and comprehensive plan update, and request DEP and the appropriate WMD(s) to participate. During the current and upcoming EAR cycles, DCA will recommend that water supply be identified as a major issue for local governments located in Regional Water Supply Planning Areas and emphasize the need to address the requirements of Section 163.3191(2)(b), F.S. The regional workshops should occur at least 18 months prior to the due date of a county's report and will be phased according to the EAR filing schedule.

4. The Agencies will also participate in any voluntary scoping meetings conducted by local governments under Section 163.3191(3), F.S.

5. With assistance from the WMDs, DCA will provide the following additional outreach services related to the EAR process: distribution of updated EAR guidelines that include water supply planning for government entities, the regulated community, and the public; and dissemination of legislative changes since the last EAR cycle.

6. DCA will strongly encourage local governments to voluntarily provide proposed EARs to commenting agencies to facilitate early coordination and minimize the need for post-adoption amendments. DCA will continue to solicit comments from the WMDs and DEP on both proposed and adopted EARs.

7. Throughout the training sessions, workshops and outreach activities described above, the Agencies will educate local governments, citizens and stakeholders on the importance and necessity of addressing water supply-related issues in EARs. The Agencies will advise and assist local governments in collecting and compiling the information necessary for determining the water supply needs of their communities, as well as possible solutions or alternatives available to satisfy identified needs.

D. Protocol for Preparation and Review of EARs

In their review of water supply-related issues or information in the EARs, the Agencies will primarily focus on areas of the state where WMDs or local governments have identified water supply concerns or where potential deficiencies of adequate potable water supplies have been identified for the planning horizon. The most water supply-sensitive areas of the state have been depicted as Regional Water Supply Planning Areas in Appendix C.

All local governments must address water supply planning in their EARs. Local governments that are not subject to regional water supply plans, including the local governments within the Suwannee River Water Management District, will have a different set of EAR requirements than local governments that are subject to regional water supply plans. The two sets of requirements are provided below. For additional guidance regarding EAR requirements, please refer to DCA's web site at http://www.dca.state.fl.us/fdcp/dcp/EAR/index.cfm.

The following list of issues has been prepared to assist local governments as they prepare EARs or plan amendments:

1. In the EAR, local governments that are not subject to a regional water supply plan, including those in the Suwannee River Water Management District, must address the need to:

    a. Update the Infrastructure Element to address water needs and sources identified in the Conservation Element, water supply development, conservation, reuse, and cooperative planning efforts related to development of multi-jurisdictional water supply facilities, including development of alternative water sources to supplement traditional sources of groundwater and surface water supplies.

    b. Update the Conservation Element to include an assessment of current and projected water needs and sources for the new proposed planning horizon (at least a 10-year period), considering the applicable District Water Management Plan.

    c. Update the Intergovernmental Coordination Element to address cooperative efforts with other local governments, public and private utilities, regional water supply authorities, special districts, and water management districts with regard to potable and reuse water service delivery. Any local government that relies on a regional water supply authority for its water supply must review this element to determine if coordination with the regional water supply authority has been addressed. If not, the comprehensive plan must be revised to address this requirement. The requirements for data and analysis and goals, objectives, and policies outlined in Rule 9J-5.015, F.A.C., for the preparation of the Intergovernmental Coordination Element can be used to address this requirement.

2. As part of the EAR, local governments that are subject to a regional water supply plan must:

    a. Address items 1.a. through 1.c. above.

    b. After the local government has adopted its 10-year water supply facilities work plan, assess the extent to which the local government has implemented the work plan for building public, private and regional water supply facilities, including the development of alternative water supplies, to meet local water use needs identified in the Infrastructure Element.

c. Indicate the extent to which the local government has been successful in identifying alternative water supply projects, traditional water supply projects, and conservation and reuse programs to meet the water needs identified in the applicable regional water supply plan.

3. All local governments, including those within the Suwannee River Water Management District, should address the following in the EAR process:

a. Whether or not the water supply concurrency provisions of Section 163.3180(2)(a), F.S., have been implemented.

b. The adequacy of existing and planned water supply facilities to serve existing and new development and meet the potable water level-of-service standards in the adopted comprehensive plan, including facilities to withdraw, transmit, treat, store and distribute potable water to achieve and maintain adopted level-of-service standards. The EAR should also evaluate the ability of the comprehensive plan to address existing deficiencies. If adequate facilities do not (or will not) exist, the EAR must include a description of corrective actions or measures, including recommendations for amendments to the Capital Improvements Element to ensure the timely construction of facilities necessary to address existing deficiencies and to meet the demands of growth for at least a projected 10-year period, and to achieve and maintain adopted level-of-service standards and meet demands of growth for the planning horizon.[20]

c. An assessment of whether the objectives of the comprehensive plan related to water supply issues have been achieved. With regard to the Intergovernmental Coordination Element, for example, the assessment should consider how successful the local government has been in coordinating with other governmental entities, private water suppliers, regional water supply authorities, and independent special districts to satisfy the demand for potable water. Inquiries might include: Have the water supply planning efforts of the local government (or other water supply entity) been coordinated with regional water supply plans? Do area water suppliers have in place the necessary plans for water supply development to satisfy the demands of growth? Have the water suppliers provided the necessary public facility reports to facilitate coordination and development of the local government's potable water sub-element and evaluation and appraisal report?[22]

d. An evaluation of any shortcomings in the relevant elements of the comprehensive plan, including the extent to which water supply data and analysis are outdated and need to be revised. When evaluating the information reflected in its comprehensive plan (including data and analysis), the local government should use the technical information contained in the applicable regional water supply plan, as well as that provided by the WMD during the

[20] FLA. STAT. § 163.3191(2)(c).
[22] FLA. STAT. § 163.3191(2)(g).

regional workshops and scoping meetings. The Agencies recognize that in certain circumstances, more current or detailed data may be available that can augment or update information available from the regional water supply planning process.

e. The EAR must include any recommended actions or corrective measures necessary to address the water supply issues identified, such as recommendations for updating the comprehensive plan to include revised planning timeframes, updated population projections, recommended changes to capital improvements, and recommended goals, objectives and policies for the water supply issues identified.[23]

The water management districts will review adopted EARs and provide comments to DCA by the 45th day of the 60-day preliminary sufficiency review period. The Agencies will review all subsequent EAR-based comprehensive plan amendments that address water supply issues to ensure that the local government has implemented the recommendations contained in the EAR, as described above.[24]

E. EAR-Based Plan Amendments

As part of developing and adopting EAR-based plan amendments, local governments should update the following information reflected in their comprehensive plan:

1. Future water demand projections calculated on the basis of professionally accepted methodologies, including:

   a. Demand projections for different categories of water users;

   b. Demand projections that are coordinated with applicable water suppliers and users;

   c. Demand projections in district water supply assessments and RWSPs;

   d. Demand projections that use appropriate methodologies to forecast average and high water use demands, such as a 1-in-10-year drought event, peak daily consumption, and/or peak seasonal consumption; and

   e. The effect of measures implemented to increase water use efficiency, conservation, and the reuse of reclaimed water.

2. Water demand projections for at least two planning periods: a five-year period that coincides with the community's schedule of planned capital improvements, and another that covers a minimum 10-year planning horizon or the established long-range planning period if greater than 10 years. The Agencies strongly encourage local governments to extend their long-range planning timeframes to coincide with the 20-year projections of the districts' RWSPs.

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23 FLA. STAT. § 163.3191(2)(i).

24 FLA. STAT. § 163.3191(10) [within 18 months after DCA determines an EAR is sufficient, the local government must amend its comprehensive plan to conform to the recommendations contained in the report].

3. A potable water facility capacity assessment that takes into account future water demand based on Bureau of Economic and Business Research (BEBR) medium-range[25] population projections, existing levels of service, and average and maximum daily water demand based on historic levels. The future demand calculation should be compared to the amount of water available for withdrawal under consumptive use permits and conclude with a determination of anticipated water supply deficiencies to serve the projected demand. The capacity assessment should also identify potential sources of potable water to service the future demand, compatible with the districts' RWSPs; evaluate the feasibility of developing future sources of potable water using information contained in the districts' RWSPs; and describe the extent to which the local government conserves potable water resources, including improved water use efficiencies and the reuse of reclaimed water.

4. The adequacy of sources of water, including existing permitted quantities of water in consumptive use permits, to meet the demands of growth reflected in the comprehensive plan. If adequate sources of water are not available or currently permitted, the report must identify actions or corrective measures to address the needs of future growth, such as development of additional sources of water supply – including alternative water supplies, conservation and reuse – to meet the identified needs, compatible with the applicable regional water supply plans (RWSPs).[26]

5. The adequacy of existing and planned funding sources to address existing facility deficiencies, achieve and maintain adopted level-of-service standards, and meet the demands of growth through the planning horizon. If adequate funding sources do not currently exist, the report must also describe the corrective actions needed, such as the identification of possible future funding sources and recommended amendments to the schedule of major capital improvements for water supply development. Local governments can access a variety of supplementary funding sources to assist with development of the identified capital improvements, such as EPA grants and loans, state revolving loan funds, and WMD financial assistance.

VI. Review of Agency Protocols

From time to time, the Agencies will review and revise the protocols described herein as appropriate.

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[25] Local governments should be strongly encouraged to use consistent projections. Rule 9J-5.005(2)(e), F.A.C., recommends the use of BEBR medium range projections. Local governments may justify, and DCA approve, the use of low- or high-range BEBR projections or the use of their own projections using another professionally accepted methodology. One of the strengths of using BEBR medium-range projections is that the sum of individual projections is subject to the total state population projection. The WMDs generally use the medium-range BEBR projections in developing their regional water supply plans.

[26] *Id.*

APPENDIX A

Growth Management Statute and Rule Requirements Related to Water Supply

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Sources:
Chapter 163, Part II, Florida Statutes (2006) - The Local Government Comprehensive Planning and Land Development Regulation Act

Chapter 9J-5, Florida Administrative Code - Minimum Criteria for Review of Local Government Comprehensive Plans and Plan Amendments, Evaluation and Appraisal Reports, Land Development Regulations and Determinations of Compliance

I. WATER SUPPLY REQUIREMENTS FOR COMPREHENSIVE PLANS

A. Section 163.3167(13), F.S.: Each local comprehensive plan shall address the water supply sources necessary to meet and achieve the existing and projected water use demand for the established planning period, considering the applicable regional water supply plan developed pursuant to Section 373.0361, F.S.

> **Comment:** Local governments must address water supply sources for the planning time frame established in the comprehensive plan and consider the applicable regional water supply plan in this planning effort.

B. Section 163.3177(4)(a), F.S.: Local comprehensive plans must be coordinated with the appropriate water management district's regional water supply plan(s) approved pursuant to Section 373.0361, F.S.

II. REQUIRED AND OPTIONAL ELEMENTS OF COMPREHENSIVE PLANS

A. Section 163.3177(3)(a), F.S.: A Capital Improvements Element that addresses the need for and location of public facilities necessary to implement the comprehensive plan and includes principles for correcting public facility deficiencies.

> **Comment:** Local governments, regional water supply authorities, and publicly and privately owned utilities are primarily responsible for funding and implementing water supply planning and development, defined as "the planning, design, construction, operation, and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale, or end use.[27] The Capital Improvements Element must include funding for major capital projects needed for water supply development. Each local comprehensive

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[27] FLA. STAT. §§ 373.0831(2)(b), .019(20).

plan must be coordinated with the appropriate water management district's regional water supply plan approved pursuant to Section 373.0361, F.S.[28]

B. Section 163.3177(6)(a), F.S.: A Future Land Use Element designating the proposed distribution, location, and extent of future uses of land for all categories of public and private uses of land, such as residential, commercial, industrial, conservation and agriculture. The future land use plan must be based upon data and analysis that estimates the amount of land needed to accommodate anticipated growth and the availability of water supplies, public facilities and services, including those for potable water.

Rule 9J-5.006, F.A.C. – Future Land Use Element

1. Requires an analysis of the availability of facilities and services identified in the Sanitary Sewer, Solid Waste, Stormwater Management, Potable Water and Natural Groundwater Aquifer Recharge Element to accommodate existing development, as well as an analysis of the amount of land needed to accommodate projected population.

2. Requires that facilities and services meet locally established level-of-service standards and are available concurrent with the impacts of development.

   Comment: Local governments must coordinate the Future Land Use Element and Future Land Use Map, including the anticipated growth allowed by the Future Land Use Map, with the availability of potable water services. The Future Land Use Element must include data and analysis demonstrating the coordination.

C. Section 163.3177(6)(c), F.S.: A General Sanitary Sewer, Solid Waste, Drainage, PotableWater, and Natural Groundwater Aquifer Recharge Element correlated to principles and guidelines for future land use and indicating ways to provide for future potable water, drainage, sanitary sewer, solid waste, and aquifer recharge.

1. Requires each local government located within an area subject to a regional water supply plan to revise the element within eighteen months after the applicable water management district approves its regional water supply plan (or update) to:

   a. Identify and incorporate the alternative water supply project(s) selected by the local government from projects identified in the updated regional water supply plan, or the alternative project(s) proposed by the local government under Section 373.0361(7), F.S.;

   b. Identify the traditional and alternative water supply projects and the conservation and reuse programs necessary to meet current and future water use demands within the local government's jurisdiction [Section 163.3177(6)(c), F.S.]; and

[28] FLA. STAT. § 163.3177(4)(a).

c. Include a water supply facilities work plan for a minimum 10-year period, for building public, private, and regional water supply facilities, which are identified in the element as necessary to serve existing and new development. The work plan must be adopted into the comprehensive plan within eighteen months after the applicable water management district approves a regional water supply plan or its update.

2. Local governments, public and private utilities, regional water supply authorities, special districts, and water management districts are encouraged to cooperatively plan for the development of multijurisdictional water supply facilities.

3. Amendments to incorporate the work plan into the local comprehensive plan are exempt from the limitation on the number of adopted amendments allowed each year.

Rule 9J-5.011, F.A.C. – Sanitary Sewer, Solid Waste, Stormwater Management, Potable Water and Natural Groundwater Aquifer Recharge Element

1. Each local government must identify facilities that provide service within its jurisdiction, including the design capacity, current demand and level of service provided by the facility.

2. A facility capacity analysis must be based on the projected demand at the current level of service for the facility, the projected population and available surplus capacity. The element must also address correcting existing facility deficiencies.

3. The element must address conserving potable water resources and protecting natural groundwater aquifer recharge areas.

4. The element must establish level of service standards.

Comment: Each local comprehensive plan must include a Potable Water Sub-Element that is consistent with the Conservation Element, in terms of current and projected water needs and sources. The potable water system consists of a water supply source, a treatment plant and a distribution and storage network. Either surface or groundwater or some combination thereof usually constitutes the source. Many local governments focus their Potable Water Sub-Elements on the infrastructure capacity available from the potable water production and distribution system rather than the availability of water from a particular source. In analyzing future demand, however, the local government should use current consumptive use permit approvals and regional water supply plans to evaluate whether adequate water supplies are available to meet projected demand. The Potable Water Sub-Element should include recommendations to reduce existing facility deficiencies and to address projected needs, including alternatives or approaches that could provide the necessary water supply development to ensure water supplies meet future demand.

D. Section 163.3177(6)(d), F.S.: A Conservation Element for the conservation, use, and protection of natural resources in the area, including water, water recharge areas, wetlands, floodplains, rivers, bays, lakes and water wells. Local governments must assess current and projected water needs and sources for a minimum 10-year

period, considering the appropriate regional water supply plan. In the absence of a regional water supply plan, local governments must consider the district water management plan approved pursuant to Section 373.036(2), F.S.

Rule 9J-5.013, F.A.C. – Conservation Element

1. Current and projected water needs and sources must be identified and analyzed for the next 10-year period based on demands for industrial, agricultural, and potable water use and the quality and quantity of water available to meet those demands. The analysis must consider existing levels of water conservation, use, and protection and applicable WMD policies.

2. The element must also address the emergency conservation of water sources in accordance with plans of the applicable water management district.

E. Section 163.3177(6)(h)1, F.S.: An Intergovernmental Coordination Element that addresses coordination with applicable regional water supply plans and to ensure coordination with the plans of regional water supply authorities.

F. Sections 163.3177(8) and (10)(e), F.S.: All elements must be based on data appropriate to the element involved. Support data or summaries are not subject to compliance review, but goals, objectives and policies should be clearly based on appropriate data. The DCA may utilize support data to aid in its determination of compliance.

Rule 9J-5.005(2), F.A.C. – Data and Analysis Requirements

The comprehensive plan must be based on data and analysis applicable to each element. The data used must be best available existing data, unless the local government desires original data or special studies. The data must be taken from professionally accepted sources, including the water management districts.

> **Comment:** Regional water supply plans are data appropriate to the Potable Water Sub-Element, Conservation Element, and Capital Improvements Element of the comprehensive plan. Those elements must be internally consistent and must be supported by adequate data and analysis. The DCA may utilize information from the regional water supply plans to support a finding of compliance.

G. Section 163.3177(9)(b), F.S.: Elements of the comprehensive plan must be related and consistent with each other.

> **Comment:** The Potable Water Sub-Element must be consistent with the plan's Conservation Element and Capital Improvements Element. The local government must therefore consider projected water needs and sources in light of the natural resource protections in the Conservation Element and the schedule of facilities contained in the Capital Improvements Element. Similarly, the Capital Improve-

ments Element and the Five-Year Schedule of Capital Improvements should include the water supply projects identified in the Potable Water Sub-Element and the Conservation Element that the local government intends to construct during the five-year period to meet the projected potable water demand.

H. Section 163.3177(9)(h), F.S.: The Intergovernmental Coordination Element of the local comprehensive plan must identify the need for and the processes and procedures to ensure the coordination of development activities and services with other units of local government, regional planning agencies, water management districts, and state and federal agencies.

> **Comment:** Procedures should be included in the Intergovernmental Coordination Element to ensure the coordination of development activities, supporting public facilities and services, and water supplies with other local governments and to ensure coordination with district regional water supply plans.

III. CONCURRENCY

A. Section 163.3180(2)(a), F.S.: Adequate water supplies and potable water facilities must be in place and available to serve new development no later than the issuance of a certificate of occupancy or its functional equivalent by a local government. Prior to approving a building permit or its functional equivalent, the local government must consult with the appropriate water supplier to determine whether adequate water supplies will be available to serve the development no later than the anticipated date of issuance of a certificate of occupancy or its functional equivalent.

Rule 9J-5.0055, F.A.C. – Concurrency Management System

Potable water facilities must be (a) available to serve new development at the time a certificate of occupancy is issued or (b) guaranteed in an enforceable development agreement or development order issued pursuant to Chapter 380, F.S.

> **Comment:** The statutory definition of "public facilities" refers to major capital improvements and includes potable water systems and facilities.[29] "Potable water facilities" means a system of structures designed to collect, treat, or distribute potable water, and includes water wells, treatment plants, reservoirs, and distribution mains.[30] Thus by definition, the potable water system includes the facilities to collect the water from its source. To ensure potable water facilities are in place and available to serve new development, the Capital Improvements Element must address funding for major capital projects needed for water supply development, e.g., new wellfields or a reverse osmosis plant.

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[29] FLA. STAT. § 163.3164(24).

[30] RULE. 9J-5.003(93).

B. Section 163.3177(10)(f), F.S.: Local governments must adopt level of service standards to evaluate whether adequate potable water service will be available concurrent with development.

Rule 9J-5.011(2)(c)2.d., F.A.C. The element must contain policies for implementing each of the facilities or resources addressed in the element, including the establishment and utilization of level-of-service standards for minimum design flow, storage capacity, and pressure of potable water facilities.

Already in Plan.

> **Comment:** Level of service is defined in Rule 9J-5.003(62), F.A.C., to mean "an indicator of the extent or degree of service provided by, or proposed to be provided by, a facility based on and related to the operational characteristics of the facility. Level of service shall indicate the capacity per unit of demand for each facility." Typical level of service standards for potable water include gallons per capita, gallons per day per residential unit or residential equivalent, and gallons per square foot for nonresidential uses for potable water facilities.

IV. EVALUATION AND APPRAISAL REPORT (EAR)

A. Section 163.3191(1), F.S.: Local governments must adopt an EAR every seven years to assess and evaluate the progress made in implementing the local comprehensive plan.

> **Comment:** Water supply issues should be a major focus of each EAR cycle, particularly for local governments located in regional water supply planning areas.

B. Section 163.3191(1)(a), F.S.: The evaluation should respond to changes in state, regional and local planning policies; reflect changes made to statutes or rules; analyze existing conditions and evolving trends; ensure effective intergovernmental coordination; and identify major growth management issues.

C. Section 163.3191(1)(c), F.S.: In identifying major issues, the local government should include participation by state agencies, regional agencies, adjacent governments, and the public.

> **Comment:** Water supply should be a major issue of concern during the next EAR update, because it is a reflection of changes in planning and growth management policies and the alteration of conditions and trends.

D. Section 163.3191(2)(c), F.S.: As the basis for updating the comprehensive plan, the EAR must include an evaluation and assessment of the financial feasibility of providing needed infrastructure to achieve and maintain adopted level-of-service standards, address infrastructure backlogs, and meet the demands of growth on public services and facilities.

Comment: The financial feasibility assessment is intended to be a retrospective review of how well a local government has provided services at the adopted level of service standards. For water supply and facilities, the assessment should evaluate whether the local government's fiscal policies and financial resources corrected deficiencies as they occurred. The EAR should include recommendations for revising the comprehensive plan to correct any fiscal deficiencies identified.

E. **Section 163.3191(2)(g), F.S.: As the basis for updating the comprehensive plan, the EAR must include an assessment of whether plan objectives within each element as they relate to major issues have been achieved, and whether unforeseen and unanticipated changes in circumstances have resulted in problems or opportunities with respect to major issues in each element.**

Comment: Objectives related to water supply must be evaluated if the local government has identified water supply as a major issue.

F. **Section 163.3191(2)(h), F.S.: The EAR must include a brief assessment of the successes and shortcomings related to each element.**

Comment: The Future Land Use, Conservation, and Intergovernmental Coordination Elements as well as the Potable Water Sub-Element must be evaluated to briefly identify revisions necessary to adequately address water supply issues. Revisions may include new or revised goals, objectives, and policies.

G. **Section 163.3191(2)(l), F.S.: The EAR must evaluate the extent to which the local government has been successful in identifying alternative water supply projects, traditional water supply projects, conservation, and reuse necessary to meet the local water supply needs identified in the applicable regional water supply plan, and evaluate the degree to which the local government has implemented the 10-year work plan for building public, private, and regional water supply facilities, including the development of alternative water supplies to serve existing and new development.**

H. **Section 163.3191(3), F.S.: Voluntary scoping meetings may be requested by a local government, but must be completed at least one year prior to the scheduled EAR adoption date. The purpose of the scoping meeting is to distribute data and resources available to assist the local government in the preparation of its EAR, provide input on major issues to be addressed in the report, and provide advice on the detail needed to address the EAR requirements. State and regional agencies should provide a list of new data and major issues that have emerged since the adoption of the original comprehensive plan or the last EAR update to the comprehensive plan.**

Appendix B

Selected Provisions Related to Water Supply and Growth Management of the
Florida Water Resources Act of 1972
Chapter 373, Florida Statutes (2006)
Florida Air and Water Pollution Control Act
Chapter 403, Florida Statutes (2006)

I. **Section 373.036(2), F.S.:** Each water management district must develop a district water management plan that addresses water supply, water quality, flood protection and floodplain management, and natural systems. The plans must include a district-wide water supply assessment to determine whether existing and anticipated sources of water and conservation efforts are adequate to supply water for existing uses, anticipated future needs and to sustain water resources and natural systems for a minimum 20-year planning period.

II. **Section 373.0361, F.S.:** Regional water supply plans must be developed for areas where sources of water are not adequate to supply existing and future reasonable-beneficial uses and to sustain water resources and related natural systems for the minimum 20-year planning period. Regional water supply plans must include a water supply development component and a water resource development component.

A list of water supply project options, including traditional and alternative water supply projects, must be included in the water supply section of the regional water supply plan. Local governments, government-owned and privately owned utilities, regional water supply authorities, multijurisdictional water supply entities, self-suppliers, and others may choose water supply projects from the list in the regional water supply plan or propose projects to be included in the list.

The water resource development portion of the regional water supply plan must include a list of water resource development projects that support water supply development.

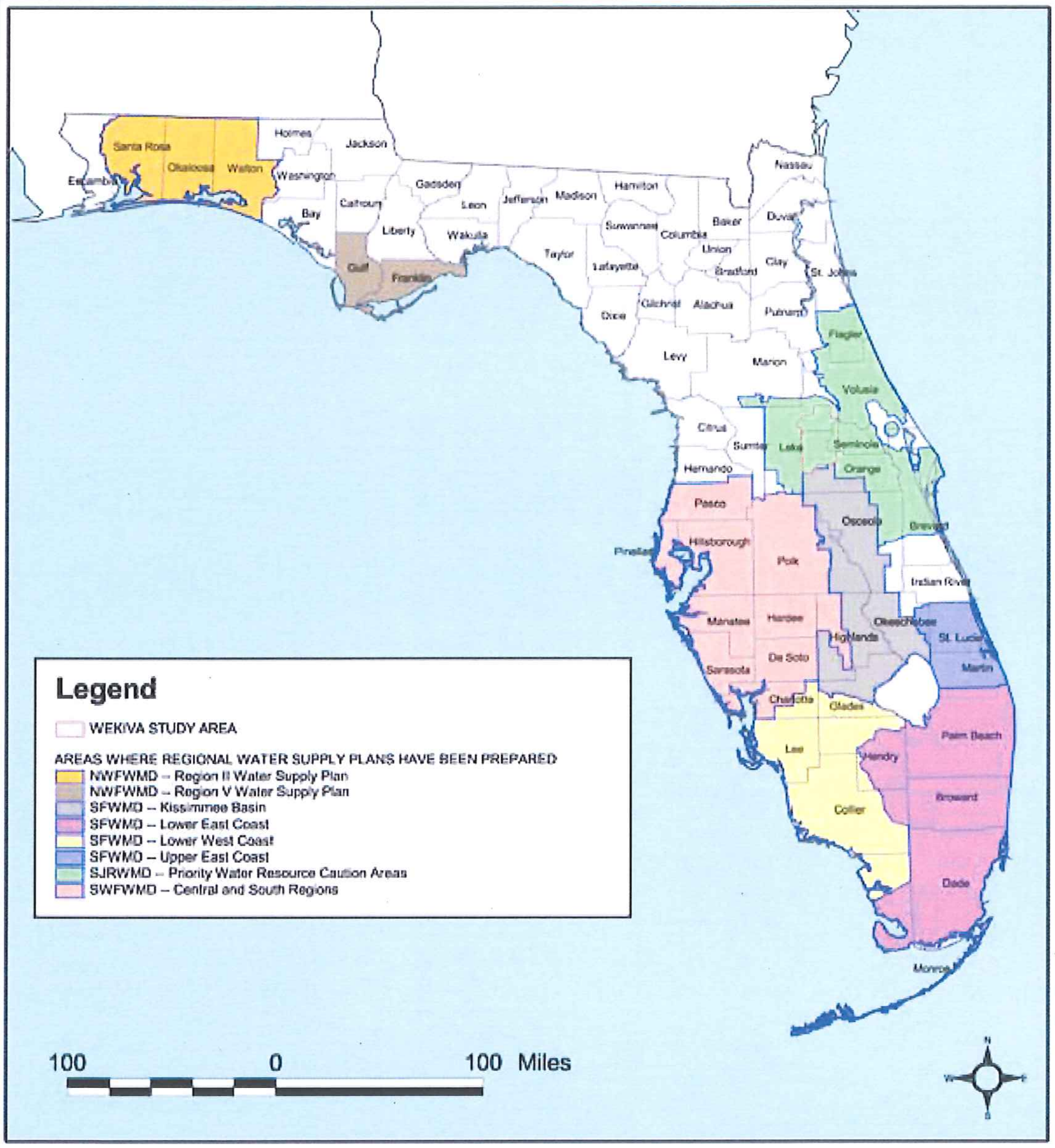
III. **Section 373.0391, F.S.:** Water management districts must provide information, data, and assistance on water resource issues to local governments to assist in the development and revision of the local government comprehensive plan elements or public facilities report required by Section 189.415, *F.S.*

IV. **Section 373.0831(1), F.S.:** The Legislature finds that:

(a) The proper role of the water management districts in water supply is primarily planning and water resource development, but this does not preclude them from providing assistance with water supply development.

(b) the proper role of local government, regional water supply authorities, and government-owned and privately owned water utilities in water supply is

Appendix C



Florida Department of Community Affairs
Division of Community Planning

Regional Water Supply Planning Areas

January 26, 2007

Due Dates for Work Plan Amendments

1. The following local governments are located in the **Northwest Florida Water Management District**'s Region II Water Supply Planning Area. An update of the area's regional water supply plan was approved by the District's Governing Board on October 26, 2006. The following local governments must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by April 26, 2008 (18 months after the District Governing Board approved the updated regional water supply plan) [s. 163.3177(6)(c), F.S.]:

   a. Okaloosa County and all municipalities located in the county

   b. Santa Rosa County and all municipalities located in the county

   c. Walton County and all municipalities located in the county

   The following local governments are located in the **Northwest Florida Water Management District**'s Region V Water Supply Planning Area. A regional water supply plan for Region V was approved by the District's Governing Board on January 25, 2007. The following local governments must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by July 25, 2008 (18 months after the District Governing Board approved the regional water supply plan) [s. 163.3177(6)(c), F.S.]:

   d. Franklin County and the municipalities of Apalachicola and Carrabelle

   e. Gulf County and the municipalities of Port St. Joe and Wewahitchka

2. The following local governments are located in the **St. Johns River Water Management District**'s Priority Water Resource Caution Area (PWRCA), a water supply planning region where existing and reasonably anticipated sources of water may not be adequate to supply water for all existing legal uses and anticipated future needs while sustaining water resources and related natural systems. The regional water supply plan for the PWRCA area (District Water Supply Plan 2005) was approved by the District Governing Board on February 7, 2006, and an addendum affecting some local governments was approved on October 10, 2006. The following local governments located within the PWRCA must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by August 7, 2007, except as noted [s. 163.3177(6)(c), F.S.]:

   a. Brevard County and the municipalities of Cape Canaveral, Cocoa, Cocoa Beach, Indialantic, Indian Harbour Beach, Melbourne, Melbourne Beach, Melbourne Village, Palm Shores, Rockledge, Satellite Beach and West Melbourne; the municipality of Titusville has a deadline of April 10, 2008.

   b. Flagler County and all municipalities located in the county

c. Lake County and the municipalities of Astatula, Clermont, Eustis, Groveland, Howey-in-the-Hills, Lady Lake, Leesburg, Mascotte, Minneola, Montverde, Mount Dora and Tavares; the municipalities of Fruitland Park and Umatilla have a deadline of April 10, 2008.

d. Marion County (part of the County – but no municipalities – is in the PWRCA) has a deadline of April 10, 2008.

e. Orange County municipalities of Apopka, Belle Isle, Eatonville, Edgewood, Maitland, and Winter Park; the municipality of Oakland has a deadline of April 10, 2008. Note: the unincorporated area of the County and the municipalities of Ocoee, Orlando and Winter Garden are split with the SFWMD – see item 4 below for the applicable deadline).

f. Osceola County is split with SFWMD – see item 4 below for deadline

g. Seminole County and all municipalities located in the county

h. Volusia County and the municipalities of Daytona Beach Shores, DeBary, DeLand, Deltona, Edgewater, Holly Hill, Lake Helen, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange and South Daytona; the municipalities of Daytona Beach and New Smyrna Beach have a deadline of April 10, 2008.

3. The following local governments are located in the **Southwest Florida Water Management District**'s Central and Southern Region, a regional water supply planning area. An updated regional water supply plan for the Central and Southern Region was approved by the District Governing Board on November 30, 2006. The following local governments located in the Central and Southern Region must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by May 30, 2008 (18 months after the District Governing Board approves the updated regional water supply plan) [s. 163.3177(6)(c), F.S.]:

a. Charlotte County and its municipality

b. DeSoto County and its municipality

c. Hardee County and all municipalities located in the county

d. Avon Park, Lake Placid, and Sebring

e. Hillsborough County and all municipalities located in the county

f. Manatee County and all municipalities located in the county

g. Pasco County and all municipalities located in the county

h. Pinellas County and all municipalities located in the county

i. All municipalities located in Polk County

j. Sarasota County and all municipalities located in the county

4. Two of the four regional water supply plans for the **South Florida Water Management District** (the Upper East Coast plan and the Lower West Coast plan) were approved by the District's Governing Board on July 12, 2006. The following local governments located in those planning regions must prepare their 10-year water supply facilities work plans and update their comprehensive plans by January 12, 2008 (18 months after the District Governing Board approved each regional water supply plan) [s. 163.3177(6)(c), F.S.]:

   a. Collier County and all municipalities located in the county
   b. Hendry County and all municipalities located in the county
   c. Lee County and all municipalities located in the county
   d. Martin County and all municipalities located in the county
   e. St. Lucie County and all municipalities located in the county

   The regional water supply plan for the Kissimmee Basin was approved by the District's Governing Board on December 14, 2006. The following local governments located in the Kissimmee Basin planning region must prepare their 10-year water supply facilities work plans and update their comprehensive plans by June 14, 2008 (18 months after the District Governing Board approved the regional water supply plan). [s. 163.3177(6)(c), F.S.]:

   f. Glades County and its municipality
   g. Highlands County
   h. Okeechobee County and its municipality
   i. Orange County, Bay Lake, Lake Buena Vista, Ocoee, Orlando, Reedy Creek, Windermere, and Winter Garden
   j. Osceola County and all municipalities located in the county
   k. Polk County

   The regional water supply plan for the Lower East Coast was approved by the District's Governing Board on February 15, 2007. The following local governments located in the Lower East Coast planning region must prepare their 10-year water supply facilities work plans and update their comprehensive plans by August 15, 2008 (18 months after the District Governing Board approved the regional water supply plan). [s. 163.3177(6)(c), F.S.]:

   n. Broward County and all municipalities located in the county
   o. Miami-Dade County and all municipalities located in the county
   p. Monroe County and all municipalities located in the county
   q. Palm Beach County and all municipalities located in the county

RECOMMENDATIONS FOR PREPARING

WATER SUPPLY AND FACILITY DATA AND ANALYSIS

TO SUPPORT

LOCAL COMPREHENSIVE PLAN AMENDMENTS

Florida Department of Community Affairs
Division of Community Planning

November 2007

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I. INTRODUCTION

Enacted by the 2005 Florida Legislature, Senate Bill 360 (Chapter 2005-290, Laws of Florida) amended Section 163.3177(6)(a), Florida Statutes (F.S.), by adding the availability of water supplies and public facilities to the list of surveys, studies and data upon which the Future Land Use Element (FLUE) and the Future Land Use Map (FLUM) must be based. The 2004 Legislature had earlier added a requirement that a local government comprehensive plan address the water supply sources necessary to meet and achieve the existing and projected water use demand for the established planning period (Section 163.3167(13), F.S.). These revisions to the growth management requirements were intended to improve the correlation between a local government's projected growth and the water supply sources and facilities needed to support and accommodate that growth.

The purpose of this document is to describe the water supply and facilities data and analysis that local governments should submit with proposed comprehensive plan amendments, particularly those that would change the FLUM to increase density or intensity. The examples provided in this guide describe the basic information and analysis that local governments should consider to support the adoption of a proposed land use change. Complex water supply scenarios should be discussed with the appropriate water management district and the Florida Department of Community Affairs (DCA or Department) to determine the level and detail of data and analysis necessary to support a proposed land use amendment. The examples contained in Section IV are provided for purposes of illustration only, and do not purport to cover all conceivable situations.

The discussion will concentrate on three major areas of concern: (1) the amount of potable water needed to support development of a proposed land use change; (2) whether the local government has an adequate supply of potable water to meet the proposed demand; and (3) whether the local government has adequate "public facilities" (i.e., water treatment, storage and distribution facilities) to support the proposed use.

This guide serves as a technical assistance document for local governments to assist with the preparation of appropriate data and analysis to support comprehensive plan amendments submitted for review to DCA. DCA prepared this guide with assistance from water management district staff involved in the review of comprehensive plan amendments and water resource and intergovernmental program staff of the Florida Department of Environmental Protection (DEP). A list of agency contacts is appended as Attachment A.

For more information about water supply planning requirements and amending a local comprehensive plan to comply with those requirements, please refer to *A Guide for Local Governments in Preparing Water Supply Comprehensive Plan Amendments and Water Supply Facilities Work Plans* available from the Department's website at http://www.dca.state.fl.us/fdcp/dcp/publications/indes.cfm.

II. GENERAL OVERVIEW

A local government proposing to adopt a plan amendment that includes map or policy changes to the land uses allowed on the FLUM must submit data and analysis to demonstrate that sufficient water supplies and water supply facilities will be available to meet the water demand for development allowed by the proposed land use change. The sections below provide a general description of the data and analysis that should be provided to support proposed land use changes that may impact water supply availability, together with examples of how the local government can demonstrate that adequate water supplies and facilities are (or will be) available to meet projected water demands.

Water supply is one of many factors DCA considers when reviewing comprehensive plan amendments. In general, all requirements in Chapter 163, Part II, F.S., and Rule 9J-5, Florida Administrative Code (F.A.C.) are considered in the review, including impacts to other public facilities such as roads, wastewater, solid waste, and recreation facilities. Urban sprawl, the amount of existing vacant land available to meet growth projections, and consistency with the goals, objectives and policies of the local comprehensive plan are other important considerations.

It should be noted that DCA does not make a concurrency determination when it reviews proposed land use changes. Instead, its review of the information submitted by the local government evaluates whether the local government is adequately planning for its water supply needs through the long-term planning period established in the comprehensive plan, which is 10 years at a minimum. The Department's review acts as a check to ascertain whether the local government should undertake additional water supply planning, update its water withdrawal or consumptive use permit, plan for new or expanded treatment and delivery facilities, or seek new alternative water resources. If a local government monitors its water use and plans for necessary improvements, it can avoid potential limitations on development that could otherwise result from concurrency requirements.

III. DATA AND ANALYSIS NECESSARY TO SUPPORT A PROPOSED LAND USE CHANGE

A. Potable Water Supplies and Treatment Facilities

In its supporting data and analysis, the local government should indicate how it will provide potable water to the site of the proposed land use change, which must be either self-supplied or supplied by one or more utilities. The water supplier and the area it serves, as well as any water treatment facilities that will provide the needed water supply, should also be identified.

Two permits are involved in determining whether adequate water supply will be available to serve a proposed land use: one that regulates the withdrawal of raw water from a groundwater, surface water or alternative water source, and one that regulates the operating capacity of the treatment facility that provides the finished water (i.e., drinking water). Through issuance of a water use or consumptive use permit (CUP), the water management districts (WMDs) regulate the amount of raw water that can be withdrawn from a water source for treatment and distribution as finished water. Raw water is processed in a water treatment facility designed and built to treat a specific quantity of water. The Florida Department of Environmental Protection (DEP) regulates the operating capacity of each water treatment facility (i.e., the amount of finished water that can be treated and distributed by the facility), which may be owned and operated by a local government utility or another public or private utility. Section D below describes the basic calculations for determining if raw water supplies and water treatment facility capacity are available to serve a proposed land use.

The amount of finished water produced by a treatment facility is not necessarily equal to the amount of raw water withdrawn from the permitted source, because some volume may be lost during treatment. In many cases, the disparity is not enough to warrant consideration in the review of comprehensive plan amendments. A differential of five percent or more is significant, however, and should be taken into account when determining the amount of finished water that will be available. If the treatment loss is five percent or more, three separate calculations should be included in the information submitted with the proposed land use amendment: the raw water supply calculation, the finished water supply calculation, and the water treatment facility operating capacity calculation.

The water supplier should be able to provide the following information necessary for determining available water supplies and treatment facility capacity:

- The amount of water that can be withdrawn from the source identified in the utility's CUP (including any timing and limiting conditions);
- The amount of water being withdrawn to meet current demand (including all distribution system losses);
- The total permitted operating capacity of the water treatment facility; and
- The amount of finished water currently being delivered from the facility.

B. Calculating the Projected Water Demand for a Proposed Land Use Change

The local government should provide the following data and analysis to support a proposed land use change: the adopted level-of-service standard(s) for potable water; the acreage of the area subject to the land use change; the sub-acreage for each proposed land use; the maximum density and intensity established in the comprehensive plan for each proposed land use; and a description of any density and intensity transfers from non-developable areas such as wetlands and floodplains. If a mixed-use land use is proposed, the residential and nonresidential components must be calculated separately and added together to determine the projected water demand.

When evaluating the water use demand for a proposed land use change, the local government should review its reserved and planned-for water supplies and facility capacities to determine whether the existing land use and the proposed change are already covered by those raw water allocations and planned facilities. An increase in development density or intensity on a site that already has water service reserved must only account for the increased water demand created by the change in land use. That is, if water supply and facility capacity have been reserved for a 20-acre parcel approved for five units per acre and the proposed land use change will increase density to 10 units per acre, the submitted data and analysis would need to demonstrate the availability of water supply and public facilities to meet the demand created by the additional 100 residential units rather than the entire 200 units being proposed.

For a proposed annexation, the data and analysis must demonstrate that adequate water supply and facility capacity are (or are planned to be) available to serve the parcel to be annexed, if not previously reserved for the site prior to annexation. The appropriate data and analysis must be submitted even if the density and intensity of development on the site remain unchanged.

If a proposed land use change has the potential to increase the demand for water on the site, the following calculations (and the data on which they are based) should be submitted with the proposed amendment:

> To calculate the water supply needs for a residential development, first determine the maximum development potential of the site by multiplying the proposed acreage by the maximum density allowed by the comprehensive plan for the land use category or categories proposed for the site. Then, multiply the maximum development potential by the adopted potable water level-of-service standard, assuming that the established standard is on a per-residential-unit basis. If the adopted level-of-service standard is a per-capita value, the standard must first be multiplied by the number of persons per household (to obtain the demand for each residential unit), then multiplied by the total number of residential units.
>
> A similar process should be used to determine water needs for non-residential land uses, but some conversion may be necessary. For example, if the land area is expressed in acres and the level-of-service standard is expressed on a per-square-foot basis, the acreage must first be converted to square feet (total acres x 43,560 square feet per acre) before multiplying by the maximum established intensity of use – usually a floor area ratio (F.A.R.). After converting the land area to square feet, the land area square footage should first be multiplied by the applicable F.A.R., then by the level-of-service standard to determine the total water needs for the non-residential development. If separate level-of-service standards for each type of non-residential land use have not been adopted, appropriate standard utility rates for the land use types may be used if they would constitute best available data. Note: if the projected demand includes water supply to serve the site at the existing density or intensity, then the amount of water available for the proposed land use change only needs to apply to the increased demand created by the increase in density or intensity.

C. Calculation of Reserved Allocations and Projected Growth Needs

When calculating whether adequate water supply will be available to serve a proposed land use change, the local government needs to account for the amount of water supply reserved for developments that have been approved but not yet built, as well as the projected water needs for the remaining long-term planning time frame established in the comprehensive plan. The amount of reserved water would be the total of (1) existing water demands, including allocation commitments under the local government's concurrency management system, and (2) other service encumbrances or commitments for approved site plans, subdivisions and other developments (including developments of regional impact). The latter commitments are usually provided through enforceable development agreements. The local government should provide the total amount of water subject to encumbrance and the timeframes covered by those commitments.

The local government must also account for the water demands projected to occur within its long-term planning period but not otherwise accounted for in the reserved water calculation. Those projected

If the numbers in Lines 7. and g. above are greater than or equal to the amount of water supply and facility capacity necessary to serve the proposed land use, then the availability of the water supply sources and treatment facilities will be considered sufficient to meet the projected demand associated with the proposed amendment. Each proposed amendment should be similarly evaluated and a cumulative assessment of impacts on water supply and water supply facilities included with the amendments. Although this approach is fairly simple to apply, unless the proposed land use changes involve small land areas or very low densities and intensities, the demand for water will often exceed the amount of water that is available in the CUP, and in some cases may exceed the residual capacity of the water treatment facility.

If either of the above calculations determines that there will not be sufficient water supply or facility capacity to serve the proposed land use, the local government must explain how both raw and finished water will be made available to meet the projected demand associated with the pro-posed amendment (see Example C. on pages 12-14). The explanation can include planning strategies to increase the supply of water through the development of new sources of water supply (including alternative sources), use of reclaimed water, increased conservation, capital improve-ments to increase treatment plant capacity (as established in a financially feasible Five-Year Schedule of Capital Improvements) or through an enforceable development agreement. Most of the foregoing alternatives will require amending the comprehensive plan, such as the adoption of site- or project-specific policies and/or projects, to ensure the availability of water supplies and public facilities consistent with the timing of the demands from the proposed land use. If the utility service area is within an area addressed by a WMD's Regional Water Supply Plan, the latest plan update provides an important starting place to identify potential water supply sources and projects that could be utilized to meet those demands.

If the local government cannot demonstrate that sufficient water supplies and water treatment facility capacity will be available to support the proposed land use change, it should not propose or adopt the amendment authorizing the land use change. However, a local government can also provide data and analysis – based upon professionally accepted and applied methodologies – to demonstrate that water supplies and facilities are (or will be) available due to a change in any of the following:

- growth projections,
- the evaluation of the impacts of the proposed land use change over the long-term planning period of the comprehensive plan (e.g., subdivision infill); or
- any phasing of the project necessary to coincide with the availability of the water supply and public facilities, including planned capital improvements.

The level of data and analysis to be provided will depend upon indicators such as the scale of development, the growth rate, whether the local government has adopted its 10-year water supply facilities work plan, and whether the local government is subject to a regional water supply plan.

E. Additional Considerations Regarding Impacts to Potable and Non-Potable Water Supplies and Public Facilities

In addition to evaluating water supply, treatment facilities, and distribution lines for potable water, local governments that were required to adopt a 10-Year Water Supply Facilities Work Plan should also address the availability of treatment facilities and transmission lines for non-potable water (e.g., water use demands can be calculated on the basis of growth projections for residential and non-residential development reflected in the local government's comprehensive plan for the five- and 10-year planning periods (or for a longer planning time frame established in the comprehensive plan).

D. Basic Calculations for Determining Available Potable Water Supply and Public Facilities to Support a Proposed Land Use Change

Whether adequate raw water supply is available to serve a proposed land use change can be determined by completing the following calculation (using consistent units such as gallons/day):

1.	Current water use allocation (CUP issued by WMD):		________
2.	Plus any raw water purchased from other suppliers:	+	________
3.	Less current demands, including distribution system losses:	–	________
4.	Less allocation(s) committed to other water suppliers:	–	________
5.	Less reserved allocations:	–	________
6.	Less projected demand:	–	________
7.	Equals amount available for proposed land use change:	=	________

Reserved allocations (Line 5) is the amount of water supply set aside for approved development, such as committed water service guaranteed through an enforceable development agreement and committed water service for any additional development not included in the five- and 10-yearprojected demands reflected on Line 6.

Projected demand (Line 6) is the water supply needed to meet anticipated growth based upon projections of residential and nonresidential development for both the short-term planning horizon (the next five years, coinciding with the local government's capital improvements plan) and the long-term planning period established in the local comprehensive plan (minimum 10-year period). Note: if the projected demand (Line 6) includes water supply to serve the site at the existing density or intensity, then the amount of water available for the proposed land use change (Line 7) only needs to apply to the increased demand created by the increase in density or intensity.

As noted earlier, if the water treatment loss is five percent or more, both the raw water supply calculation (shown above) and a finished water supply calculation should be included in the information submitted. The finished water facility operating capacity calculation (shown below) is a separate and distinct computation that should also be submitted.

The availability of finished water facility capacity to serve a proposed land use change can be calculated using the following formula:

a.	Current water treatment facility permitted capacity:		________
b.	Plus any finished water purchased from other suppliers	+	________
c.	Less amount of finished water allocated to existing development:	–	________
d.	Less quantity of finished water committed to other water suppliers:	–	________
e.	Less quantity of finished water reserved for approved development:	–	________
f.	Less quantity of finished water for projected demand:	–	________
g.	Equals amount of finished water facility capacity available:	=	________

DO – letter of availability
or
LCU Staff review

reclaimed water for irrigation) to serve the proposed land use change. Local governments should also address what water conservation measures will be applied to the development of the site.

All local governments must describe how the identified impacts have been (or will be) addressed in the Capital Improvements Element, the 10-year Water Supply Facilities Work Plan (if applicable), and the Potable Water Sub-Element of the comprehensive plan to address any needed capital improvements including capital improvements provided through an enforceable development agreement under Chapter 163, F.S.

Local governments are reminded that after determining that an adequate water supply and water treatment capacity are available to serve a proposed land use change, the five-year and long-term projections for water demand, water supply, and water treatment facility capacity must be re-evaluated to ensure that sufficient water supplies and facility capacity remain available to meet projected demand. If the projected demand can no longer be met as a result of the land use change, the local government must submit planning strategies and implementation actions with the proposed comprehensive plan amendment to ensure that water sources, supplies, and treatment facilities will be available to meet long-term projected water demands.

For more information about capital improvements planning, please see the Department's technical assistance report, *A Guide to the Annual Update of the Capital Improvements Element*, available on the Department's website at http://www.dca.state.fl.us/fdcp/DCP/publications/index.cfm.

IV. EXAMPLES OF WATER SUPPLY DATA AND ANALYSIS TO SUPPORT LAND USE CHANGES

The examples below are provided as guidance for local governments on the data and analysis that should be submitted with any plan amendment that proposes to change a future land use. Examples were selected to represent typical situations that apply to a broad range of local governments. If a local government encounters a situation that is not addressed in these guidelines, it is encouraged to contact DCA's Division of Community Planning for assistance.

If a local government submits data and analysis that refers to supporting materials, copies of the referenced materials should be included in the data and analysis submitted with the amendment.

A. Increase in Potable Water Demand in Utility Service Area (Sufficient Water Available)

- A 20-acre parcel is located in the County's utility service area, and the County has indicated that it will provide service. The proposed land use change is from Residential to Commercial. The undeveloped parcel does not have water service reserved.

- The proposed future land use designation will allow a maximum commercial area of 435,600 square feet based on a floor area ratio of 0.5 applied to the 20-acre site. The Potable Water Sub-Element indicates that the average daily water demand (level-of-service standard) is 0.15 gpd for each square foot of commercial development. The maximum potential water demand for the proposed Commercial land use is 435,600 square feet x 0.15 gpd/square foot = 65,340 gpd or 0.065 mgd.

- The County's CUP allows an annual average groundwater withdrawal of 1.38 million gallons per day (mgd). The current average daily withdrawal is 1.00 mgd (including distribution system losses). The County does not have any agreements to obtain water or provide water to other utilities, and its concurrency management system indicates that 0.12 mgd has been committed to previously approved development. To meet its growth projections, the County's projected water demand is 0.15 mgd. Utilizing the above information, the following calculation is made to determine if sufficient water supply is available through the consumptive use permit to meet the water demand for the proposed commercial use of the site:

1. Current water use allocation (CUP issued by WMD):	1.380 mgd
2. Plus any raw water purchased from other suppliers:	+ 0.000 mgd
3. Less current demand, including distribution system losses:	– 1.000 mgd
4. Less allocation(s) committed to other water suppliers:	– 0.000 mgd
5. Less reserved allocations:	– 0.120 mgd
6. Less projected demand:	– 0.150 mgd
7. Equals amount available for proposed land use change:	= 0.110 mgd

A sufficient supply of water is available to serve development of the site (0.065 mgd).

The permitted capacity of the County's water treatment facility for finished water is 2.30 mgd. The average daily potable water currently produced (finished water) at the plant is 0.95 mgd. To determine if the water treatment plant has sufficient permitted capacity to serve the commercial development of the site, the following calculation is made.

a. Current water treatment facility permitted capacity:	2.300 mgd
b. Plus any finished water purchased from other suppliers:	+ 0.000 mgd
c. Less amount of finished water allocated to existing development:	– 0.950 mgd
d. Less quantity of finished water committed to other water suppliers:	– 0.000 mgd
e. Less quantity of finished water reserved for approved development:	– 0.120 mgd
f. Less quantity of finished water for projected demand:	– 0.150 mgd
g. Equals amount of finished water facility capacity available:	= 1.080 mgd

The water treatment plant has sufficient permitted capacity to serve the commercial development of the site.

B. Increase in Potable Water Demand in Utility Service Area (Limited Water Supply)

In this example, the CUP does not allow sufficient water withdrawals for the proposed land use change in the current year. An alternative methodology is provided to demonstrate that sufficient water would be available if based upon planned incremental increases in water withdrawals for phased development. The St. Johns River Water Management District often issues a type of permit that allows incremental increases in water withdrawals. Other water management districts typically approve a single allocation over the lifetime of the permit. The undeveloped parcel does not have water service reserved.

- A 50-acre property is located in the City's utility service area and the City will provide service to the site. A land use change is proposed to increase residential density from five dwelling units per acre to 10 dwelling units per acre. Water supply and water treatment capacity have not been reserved for the five dwelling units per acre residential land use category. The project will be developed in phases of 50 units per year for 10 years.

- The proposed future land use designation will allow a maximum of 10 dwelling units per acre on the 50-acre site, which results in a maximum development potential of 500 dwelling units. The Potable Water Sub-Element indicates that the average daily water demand (level-of-service standard) is 300 gallons per day (gpd) for each dwelling unit. The maximum potential water demand for the new development would be calculated as follows: 500 dwelling units x 300 gpd/dwelling unit = 150,000 gpd or 0.15 mgd for development of the entire parcel.

- The City's CUP allows an annual average daily water withdrawal of 6.00 mgd with an annual increase of 0.25 mgd for each of the next 10 years; the current average daily withdrawal is 5.50 mgd. The City's concurrency management system indicates that 0.2 mgd has been committed for other approved developments over the next two years. In addition, the City's water demand to meet its 10-year growth projection (projected demand) is 0.16 mgd. The City does not have any agreements to obtain water or to provide water to other utilities. The following calculation reflects the availability of raw water under the CUP, based on the increase in water demand created by developing the entire site at 10 units per acre.

1. Current water use allocation (CUP issued by WMD):	6.00 mgd
2. Plus any raw water purchased from other suppliers:	+ 0.00 mgd
3. Less current demands, including distribution system losses:	– 5.50 mgd
4. Less allocation(s) committed to other water suppliers:	– 0.00 mgd
5. Less reserved allocations:	– 0.20 mgd
6. Less projected demand:	– 0.16 mgd
7. Equals amount available for proposed land use change:	= 0.14 mgd

- The methodology utilized above demonstrates that there is not sufficient water supply available to meet the demand for water created by the proposed land use change (0.15 mgd), if the water availability calculation is based on the entire site being developed in the current year.

- Under an incremental approach, however, the amendment could be adopted in the current year, if it limits development to 50 units per year. With the annual incremental increase of 0.25 mgd (this example only) applied to the City's CUP in subsequent years, the City could reserve water for 50 units per year through its concurrency management system. In the current year, when development approval is sought for the first 50 units (0.015 mgd for 50 units at 300 gpd/dwelling unit), the City's CUP will have sufficient water to serve the development (see line 6 above).

- The above calculation results in a surplus for the year of 0.125 mgd that can be carried forward into the next year (0.14 mgd less 0.015 mgd for the first 50 units).

Continuing the calculations through the 10-year build-out of the project shows that the City will have sufficient water supplies to serve the phased project, based on the annual incremental increases applied to the CUP by the water management district. With annual incremental increases of 0.25 mgd, the CUP will allow 8.5 mgd to be withdrawn from the permitted source by the 10th year (6.0 mgd in current allocation plus 2.5 mgd in incremental increases over 10 years = 8.5 mgd).

The following calculation shows the status of the City's CUP in the 10th year:

1. Water use allocation (CUP issued by WMD):	8.50 mgd
2. Plus any raw water purchased from other suppliers:	+ 0.00 mgd
3. Less demand in 10th year:	– 5.86 mgd*
4. Less allocation(s) committed to other water suppliers:	– 0.00 mgd
5. Less reserved allocations:	– 0.00 mgd
6. Less projected 10-year demand for the proposed land use change:	– 0.15 mgd
7. Equals amount remaining:	= 2.49 mgd

*5.50 mgd initial year plus 0.2 mgd for approved development in first two years plus 0.16 mgd to serve projected growth over the 10-year time frame

- The City has two interconnected water treatment facilities but a maximum withdrawal of 6 mgd for both, which together have a DEP-permitted capacity of 10.0 mgd. The current average daily amount of finished water produced at the facilities is 5.50 mgd (for this example, the amount of raw water withdrawn under the CUP is the same as the finished water produced at the treatment plant). The treated water capacity available to serve new development is 4.14 mgd, calculated as follows:

a. Current water treatment facility permitted capacity:	10.00 mgd
b. Plus any finished water purchased from other suppliers:	+ 0.00 mgd
c. Less amount of finished water allocated to existing development:	– 5.50 mgd
d. Less quantity of finished water committed to other water suppliers:	– 0.00 mgd
e. Less quantity of finished water reserved for approved development:	– 0.20 mgd
f. Less quantity of finished water for projected demand:	– 0.16 mgd
g. Equals amount of finished water facility capacity available:	= 4.14 mgd

Build-out of the parcel will require 0.15 mgd in finished water. The City's water treatment facilities can provide the necessary finished water to the proposed development.

- A site-specific policy must also be adopted into the Future Land Use Element to limit development on the site to 50 units per year.

C. Increased Potable Water Demand Requiring an Addition to the Service Area and Alternative Water Supply Development (Large Development)

- A 200-acre parcel is located in an unincorporated area of the County, adjacent to the service area of a private water utility, which has agreed to provide water service to the site. An updated utility service area map as part of the data and analysis that includes the

200-acre parcel will be added to the Potable Water Sub-Element simultaneously with the proposed land use change.

- The utility's CUP allows an annual average daily groundwater withdrawal of 0.65 mgd and the current annual average withdrawal is 0.64 mgd. The utility has a water treatment facility with a DEP-permitted capacity of 1.0 mgd. Although the existing Future Land Use designation of the parcel allows a maximum of two dwelling units per acre, the utility has no projected water demand associated with the parcel, because it lies outside the utility's future service area. The undeveloped parcel does not have water service reserved.

- The proposed Future Land Use designation would allow 10 units per acre, which would result in a maximum development potential of 2,000 dwelling units. The Potable Water Sub-Element indicates that the average daily water demand is 360 gpd for each dwelling unit. The potential water demand for 2,000 dwelling units is 720,000 gpd or 0.72 mgd. Because it was obvious that a development of this scale would exceed the water supply limits relative to the CUP and the facility capacity, the County provided detailed analysis indicating how water supply sources and facilities would be addressed.

- Development of the site subject to the land use change is expected to occur over the next 10 years and will provide housing for 4,500 residents, based on the County's household size of 2.25 persons. The County also proposes adjustments to its population projections.

- Support documents for the regional water supply plan indicate that the projected water demand for the utility in 2025 is 1.2 mgd, based on a total population of 7,500 and a projected water demand of 160 gallons per capita per day (gcd) or 360 gallons per day per dwelling unit, together with another 0.15 mgd for nonresidential uses (this local government has adopted separate level of service standards for residential and non-residential uses). The regional water supply plan indicates that the utility should develop an alternative surface water supply source and provide reclaimed water to new development to be able to meet the 2025 demand. The addition of 4,500 residents to the utility's service area will accelerate the need for development of alternative water supply projects and affect population and demand projections in future updates to the regional water supply plan.

- The developer will pay for development of the alternative surface water supply source and the reclaimed water project, which will be operational within three years. As part of the amendment package, the County will add to its 10-year water supply facilities work plan the information provided by the utility to the water management district regarding the proposed water sources, the quantity of water to be produced, and the status of project implementation, including funding and implementation schedules, permit status, and efforts to coordinate with other utilities to develop alternative water supplies. The County and utility will ensure that appropriate information will be provided to the water management district for the next update of the regional water supply plan.

- The County has included in the submitted amendment package an update to its data and analysis describing the construction of the alternative water supply project, the expansion of the water treatment facility, the upgrade of its wastewater treatment facility, and the extension of the water and reclaimed water lines. An enforceable development agreement under Chapter 163, F.S., will be used to implement the water and wastewater projects to serve the site. The agreement will be signed in conjunction with adoption of the comprehensive plan land use amendment and referenced in the County's data and analysis. The agreement will ensure the financial feasibility of the projects and require that the necessary water supply source, treatment facilities and transmission facilities are in place concurrent with any development allowed under the agreement.

- The utility will apply for a CUP modification to develop the surface water supply source and modify its service area, and the County has added this information to its Water Sub-Element and its 10-year water supply facilities work plan and updated its comprehensive plan, as appropriate.

- The utility will upgrade its wastewater treatment facility within three years to treat 3.0 million gallons of wastewater per day. The County has added this information to its Wastewater Sub-Element and its data and analysis.

- The County has included data and analysis updates to the Potable Water Sub-Element and the Conservation Element to account for the change in projected water needs and sources for both the next 10-year period and the overall long-term planning time frame established in the comprehensive plan.

- The development of the site will also be governed by a development of regional impact development order that will be adopted in conjunction with the comprehensive plan amendment. That development order will require that the necessary water supply sources, treatment facilities and transmission facilities be in place concurrent with any development allowed under the development order.

LOS for wtr supply

V. BASIS OF SUBMITTED DATA AND ANALYSIS

Prior to submitting a comprehensive plan amendment to the Department for review, the local government should verify that the data and analysis to ensure the water use demand projections and water supply and facility availabilities are based upon professionally accepted and applied methodologies and the following:

- The level-of-service standards adopted by the local government in its comprehensive plan;
- The maximum allowed densities and intensities established in the comprehensive plan for the proposed land use – not the proposed development density or intensity for the subject parcel – unless the site-specific development limitation is adopted as a policy in the comprehensive plan; and
- The annual average daily withdrawal rate specified in the CUP issued by the water management district – not the peak month daily rate for water withdrawal.

VI. FINAL COMMENT

The Department of Community Affairs is interested in knowing if these *Recommendations for Preparing Water Supply and Facility Data and Analysis to Support Local Comprehensive Plan Amendments* are providing useful guidance to local planners, consultants, utilities, residents, and other interested parties. Anyone who has comments or suggestions for improving this guide should provide your recommendations to:

Vicki Morrison, Principal Planner
Division of Community Planning
Florida Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399-2100
Phone: (850) 921-3775, Suncom 291-3775
vicki.morrison@dca.state.fl.us

ATTACHMENT A

Agency and District Contacts:

Florida Department of Community Affairs

Vicki Morrison, Principal Planner
(850) 921-3775; Suncom 291-3775
vicki.morrison@dca.state.fl.us
www.dca.state.fl.us

Florida Department of Environmental Protection

Janet Llewellyn, Deputy Director
Division of Water Resource Management
(850) 245-8676; Suncom 205-8676
janet.llewellyn@dep.state.fl.us
www.dep.state.fl.us

Northwest Florida Water Management District

Paul Thorpe, AICP, Director
Resource Planning Section
(850) 539-5999; (800) 913-1518; Suncom 771-2080, ext. 133
paul.thorpe@nwfwmd.state.fl.us
www.nwfwmd.state.fl.us

St. Johns River Water Management District

Peter Brown, Policy Analyst
(386) 329-4311; (800) 451-7106; Suncom 860-4311
pbrown@sjrwmd.com
www.sjrwmd.com

Suwannee River Water Management District

David Still, Deputy Executive Director
(386) 362-1001 or (800) 226-1066
still_d@srwmd.state.fl.us

Steven Minnis, Senior Resource Development Coordinator
(386) 362-1001 or (800) 226-1066
minnis_s@srwmd.state.fl.us
www.srwmd.state.fl.us

Southwest Florida Water Management District

Rand Frahm, AICP, Planning Manager
(352) 796-7211 or (800) 423-1476, ext. 4411
Rand.Frahm@watermatters.org

Miki Renner, AICP, Planning Manager
(352) 796-7211 or (800) 423-1476, ext. 4413
Miki.Renner@watermaters.org
www.watermatters.org

South Florida Water Management District

Jim Jackson, AICP, Senior Supervising Planner
(561) 682-6334; (800) 432-2045, ext. 6334; Suncom 229-6334
jjackson@sfwmd.gov

Henry Bittaker, AICP, Senior Planner
Comprehensive Planning Issues
(561) 682-6792; (800) 432-2045, ext. 6792; Suncom 229-6792
hbittak@sfwmd.gov
www.sfwmd.gov

B. **Section 163.3177(10)(f), F.S.: Local governments must adopt level of service standards to evaluate whether adequate potable water service will be available concurrent with development.**

Rule 9J-5.011(2)(c)2.d., F.A.C. The element must contain policies for implementing each of the facilities or resources addressed in the element, including the establishment and utilization of level-of-service standards for minimum design flow, storage capacity, and pressure of potable water facilities.

Already in Plan.

> **Comment:** Level of service is defined in Rule 9J-5.003(62), F.A.C., to mean "an indicator of the extent or degree of service provided by, or proposed to be provided by, a facility based on and related to the operational characteristics of the facility. Level of service shall indicate the capacity per unit of demand for each facility." Typical level of service standards for potable water include gallons per capita, gallons per day per residential unit or residential equivalent, and gallons per square foot for nonresidential uses for potable water facilities.

IV. EVALUATION AND APPRAISAL REPORT (EAR)

A. **Section 163.3191(1), F.S.: Local governments must adopt an EAR every seven years to assess and evaluate the progress made in implementing the local comprehensive plan.**

> **Comment:** Water supply issues should be a major focus of each EAR cycle, particularly for local governments located in regional water supply planning areas.

B. **Section 163.3191(1)(a), F.S.: The evaluation should respond to changes in state, regional and local planning policies; reflect changes made to statutes or rules; analyze existing conditions and evolving trends; ensure effective intergovernmental coordination; and identify major growth management issues.**

C. **Section 163.3191(1)(c), F.S.: In identifying major issues, the local government should include participation by state agencies, regional agencies, adjacent governments, and the public.**

> **Comment:** Water supply should be a major issue of concern during the next EAR update, because it is a reflection of changes in planning and growth management policies and the alteration of conditions and trends.

D. **Section 163.3191(2)(c), F.S.: As the basis for updating the comprehensive plan, the EAR must include an evaluation and assessment of the financial feasibility of providing needed infrastructure to achieve and maintain adopted level-of-service standards, address infrastructure backlogs, and meet the demands of growth on public services and facilities.**

<u>Comment</u>: The financial feasibility assessment is intended to be a retrospective review of how well a local government has provided services at the adopted level of service standards. For water supply and facilities, the assessment should evaluate whether the local government's fiscal policies and financial resources corrected deficiencies as they occurred. The EAR should include recommendations for revising the comprehensive plan to correct any fiscal deficiencies identified.

E. Section 163.3191(2)(g), F.S.: As the basis for updating the comprehensive plan, the EAR must include an assessment of whether plan objectives within each element as they relate to major issues have been achieved, and whether unforeseen and unanticipated changes in circumstances have resulted in problems or opportunities with respect to major issues in each element.

Comment: Objectives related to water supply must be evaluated if the local government has identified water supply as a major issue.

F. Section 163.3191(2)(h), F.S.: The EAR must include a brief assessment of the successes and shortcomings related to each element.

<u>Comment</u>: The Future Land Use, Conservation, and Intergovernmental Coordination Elements as well as the Potable Water Sub-Element must be evaluated to briefly identify revisions necessary to adequately address water supply issues. Revisions may include new or revised goals, objectives, and policies.

G. Section 163.3191(2)(l), F.S.: The EAR must evaluate the extent to which the local government has been successful in identifying alternative water supply projects, traditional water supply projects, conservation, and reuse necessary to meet the local water supply needs identified in the applicable regional water supply plan, and evaluate the degree to which the local government has implemented the 10-year work plan for building public, private, and regional water supply facilities, including the development of alternative water supplies to serve existing and new development.

H. Section 163.3191(3), F.S.: Voluntary scoping meetings may be requested by a local government, but must be completed at least one year prior to the scheduled EAR adoption date. The purpose of the scoping meeting is to distribute data and resources available to assist the local government in the preparation of its EAR, provide input on major issues to be addressed in the report, and provide advice on the detail needed to address the EAR requirements. State and regional agencies should provide a list of new data and major issues that have emerged since the adoption of the original comprehensive plan or the last EAR update to the comprehensive plan.

Appendix B

Selected Provisions Related to Water Supply and Growth Management of the
Florida Water Resources Act of 1972
Chapter 373, Florida Statutes (2006)
Florida Air and Water Pollution Control Act
Chapter 403, Florida Statutes (2006)

I. **Section 373.036(2), F.S.:** Each water management district must develop a district water management plan that addresses water supply, water quality, flood protection and floodplain management, and natural systems. The plans must include a district-wide water supply assessment to determine whether existing and anticipated sources of water and conservation efforts are adequate to supply water for existing uses, anticipated future needs and to sustain water resources and natural systems for a minimum 20-year planning period.

II. **Section 373.0361, F.S.:** Regional water supply plans must be developed for areas where sources of water are not adequate to supply existing and future reasonable-beneficial uses and to sustain water resources and related natural systems for the minimum 20-year planning period. Regional water supply plans must include a water supply development component and a water resource development component.

A list of water supply project options, including traditional and alternative water supply projects, must be included in the water supply section of the regional water supply plan. Local governments, government-owned and privately owned utilities, regional water supply authorities, multijurisdictional water supply entities, self-suppliers, and others may choose water supply projects from the list in the regional water supply plan or propose projects to be included in the list.

The water resource development portion of the regional water supply plan must include a list of water resource development projects that support water supply development.

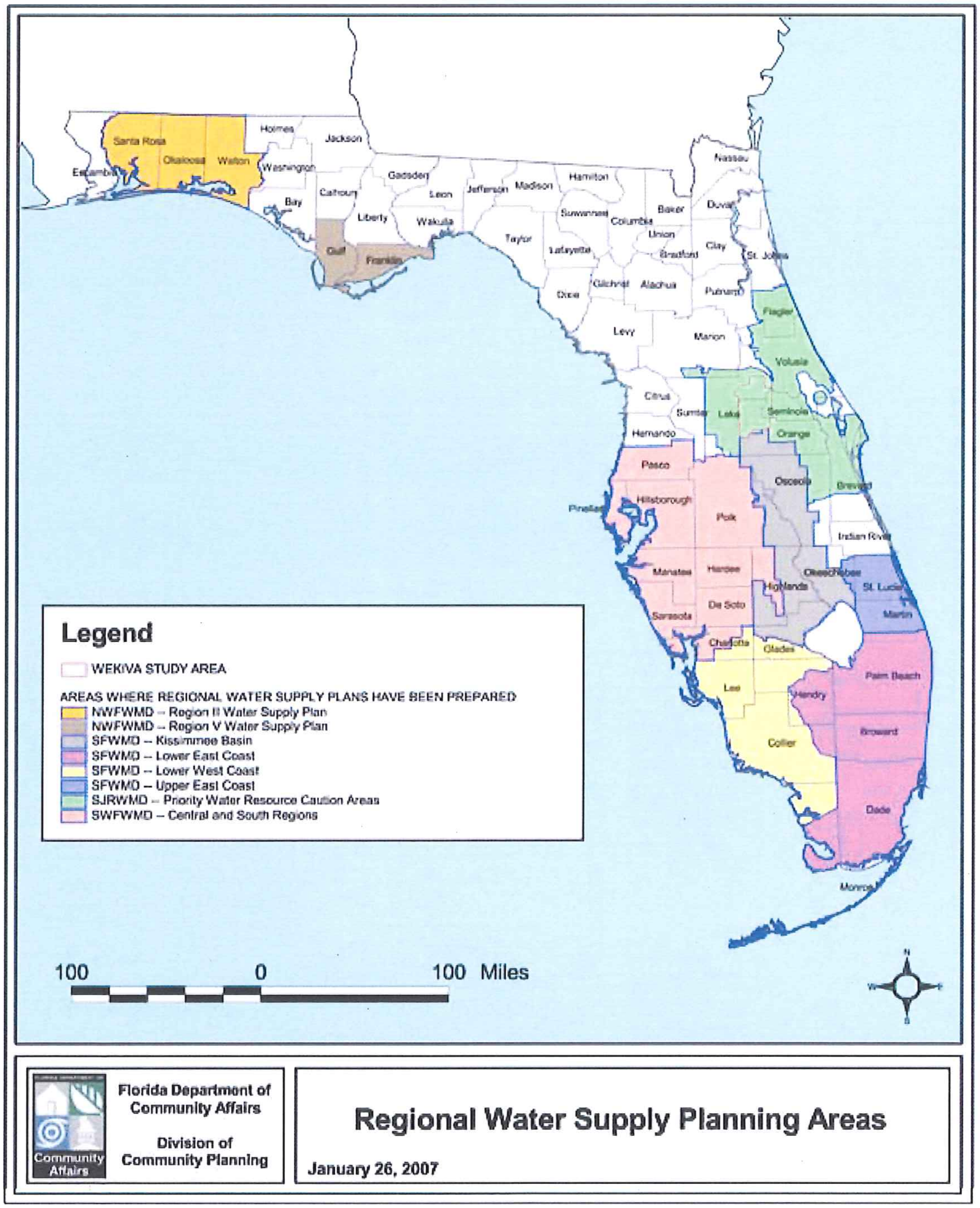
III. **Section 373.0391, F.S.:** Water management districts must provide information, data, and assistance on water resource issues to local governments to assist in the development and revision of the local government comprehensive plan elements or public facilities report required by Section 189.415, *F.S.*

IV. **Section 373.0831(1), F.S.:** The Legislature finds that:

(a) The proper role of the water management districts in water supply is primarily planning and water resource development, but this does not preclude them from providing assistance with water supply development.

(b) the proper role of local government, regional water supply authorities, and government-owned and privately owned water utilities in water supply is

Appendix C


Legend
WEKIVA STUDY AREA
AREAS WHERE REGIONAL WATER SUPPLY PLANS HAVE BEEN PREPARED
NWFWMD -- Region II Water Supply Plan
NWFWMD -- Region V Water Supply Plan
SFWMD -- Kissimmee Basin
SFWMD -- Lower East Coast
SFWMD -- Lower West Coast
SFWMD -- Upper East Coast
SJRWMD -- Priority Water Resource Caution Areas
SWFWMD -- Central and South Regions
100 0 100 Miles
Florida Department of Community Affairs
Division of Community Planning
Community Affairs
Regional Water Supply Planning Areas
January 26, 2007

Due Dates for Work Plan Amendments

1. The following local governments are located in the **Northwest Florida Water Management District**'s Region II Water Supply Planning Area. An update of the area's regional water supply plan was approved by the District's Governing Board on October 26, 2006. The following local governments must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by April 26, 2008 (18 months after the District Governing Board approved the updated regional water supply plan) [s. 163.3177(6)(c), F.S.]:

    a. Okaloosa County and all municipalities located in the county

    b. Santa Rosa County and all municipalities located in the county

    c. Walton County and all municipalities located in the county

    The following local governments are located in the **Northwest Florida Water Management District**'s Region V Water Supply Planning Area. A regional water supply plan for Region V was approved by the District's Governing Board on January 25, 2007. The following local governments must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by July 25, 2008 (18 months after the District Governing Board approved the regional water supply plan) [s. 163.3177(6)(c), F.S.]:

    d. Franklin County and the municipalities of Apalachicola and Carrabelle

    e. Gulf County and the municipalities of Port St. Joe and Wewahitchka

2. The following local governments are located in the **St. Johns River Water Management District**'s Priority Water Resource Caution Area (PWRCA), a water supply planning region where existing and reasonably anticipated sources of water may not be adequate to supply water for all existing legal uses and anticipated future needs while sustaining water resources and related natural systems. The regional water supply plan for the PWRCA area (District Water Supply Plan 2005) was approved by the District Governing Board on February 7, 2006, and an addendum affecting some local governments was approved on October 10, 2006. The following local governments located within the PWRCA must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by August 7, 2007, except as noted [s. 163.3177(6)(c), F.S.]:

    a. Brevard County and the municipalities of Cape Canaveral, Cocoa, Cocoa Beach, Indialantic, Indian Harbour Beach, Melbourne, Melbourne Beach, Melbourne Village, Palm Shores, Rockledge, Satellite Beach and West Melbourne; the municipality of Titusville has a deadline of April 10, 2008.

    b. Flagler County and all municipalities located in the county

c. Lake County and the municipalities of Astatula, Clermont, Eustis, Groveland, Howey-in-the-Hills, Lady Lake, Leesburg, Mascotte, Minneola, Montverde, Mount Dora and Tavares; the municipalities of Fruitland Park and Umatilla have a deadline of April 10, 2008.

d. Marion County (part of the County – but no municipalities – is in the PWRCA) has a deadline of April 10, 2008.

e. Orange County municipalities of Apopka, Belle Isle, Eatonville, Edgewood, Maitland, and Winter Park; the municipality of Oakland has a deadline of April 10, 2008. Note: the unincorporated area of the County and the municipalities of Ocoee, Orlando and Winter Garden are split with the SFWMD – see item 4 below for the applicable deadline).

f. Osceola County is split with SFWMD – see item 4 below for deadline

g. Seminole County and all municipalities located in the county

h. Volusia County and the municipalities of Daytona Beach Shores, DeBary, DeLand, Deltona, Edgewater, Holly Hill, Lake Helen, Oak Hill, Orange City, Ormond Beach, Pierson, Ponce Inlet, Port Orange and South Daytona; the municipalities of Daytona Beach and New Smyrna Beach have a deadline of April 10, 2008.

3. The following local governments are located in the **Southwest Florida Water Management District**'s Central and Southern Region, a regional water supply planning area. An updated regional water supply plan for the Central and Southern Region was approved by the District Governing Board on November 30, 2006. The following local governments located in the Central and Southern Region must therefore prepare their 10-year water supply facilities work plans and update their comprehensive plans by May 30, 2008 (18 months after the District Governing Board approves the updated regional water supply plan) [s. 163.3177(6)(c), F.S.]:

   a. Charlotte County and its municipality

   b. DeSoto County and its municipality

   c. Hardee County and all municipalities located in the county

   d. Avon Park, Lake Placid, and Sebring

   e. Hillsborough County and all municipalities located in the county

   f. Manatee County and all municipalities located in the county

   g. Pasco County and all municipalities located in the county

   h. Pinellas County and all municipalities located in the county

   i. All municipalities located in Polk County

   j. Sarasota County and all municipalities located in the county

4. Two of the four regional water supply plans for the **South Florida Water Management District** (the Upper East Coast plan and the Lower West Coast plan) were approved by the District's Governing Board on July 12, 2006. The following local governments located in those planning regions must prepare their 10-year water supply facilities work plans and update their comprehensive plans by January 12, 2008 (18 months after the District Governing Board approved each regional water supply plan) [s. 163.3177(6)(c), F.S.]:

   a. Collier County and all municipalities located in the county
   b. Hendry County and all municipalities located in the county
   c. Lee County and all municipalities located in the county
   d. Martin County and all municipalities located in the county
   e. St. Lucie County and all municipalities located in the county

   The regional water supply plan for the Kissimmee Basin was approved by the District's Governing Board on December 14, 2006. The following local governments located in the Kissimmee Basin planning region must prepare their 10-year water supply facilities work plans and update their comprehensive plans by June 14, 2008 (18 months after the District Governing Board approved the regional water supply plan). [s. 163.3177(6)(c), F.S.]:

   f. Glades County and its municipality
   g. Highlands County
   h. Okeechobee County and its municipality
   i. Orange County, Bay Lake, Lake Buena Vista, Ocoee, Orlando, Reedy Creek, Windermere, and Winter Garden
   j. Osceola County and all municipalities located in the county
   k. Polk County

   The regional water supply plan for the Lower East Coast was approved by the District's Governing Board on February 15, 2007. The following local governments located in the Lower East Coast planning region must prepare their 10-year water supply facilities work plans and update their comprehensive plans by August 15, 2008 (18 months after the District Governing Board approved the regional water supply plan). [s. 163.3177(6)(c), F.S.]:

   n. Broward County and all municipalities located in the county
   o. Miami-Dade County and all municipalities located in the county
   p. Monroe County and all municipalities located in the county
   q. Palm Beach County and all municipalities located in the county