Master Plan for the Regional Irrigation Distribution System (RIDS) For the Lower West Coast Region Project C-12368

South Florida Water Management District

December 2002

Regional Irrigation Distribution System (RIDS) Master Plan Final Report

South Florida Water Management District

Boyle Engineering Corporation

Project Manager Larry W. Bishop, PE

Project Engineer Ann Phillippe, EI

FW-S62-201-02

November 2002

BOYLE 5971 Cattleridge Blvd., Suite 200 Sarasota, FL 34232

Table of Contents

List of Figures

Page No.

List of Tables

Page No.

List of Attachments

EXECUTIVE SUMMARY

The objective of the Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region is to develop a program to supply enough water to meet all or a portion of the projected (year 2020) urban irrigation demand associated with future growth in Lee and Collier counties. Although the area has been progressive in developing alternative supply sources including reclaimed water, these sources will not be adequate to meet future demands. Also, because many of the utilities in the study area have their own discrete infrastructure, there has been no optimization of the resource on a regional basis. Therefore, it has been determined by the South Florida Water Management District (District) that a master plan is required to evaluate these needs.

The RIDS project was one of the recommendations identified in the District's *Lower West Coast Water Supply Plan* (Water Supply Plan) completed in April 2000. The Water Supply Plan recommended the RIDS to evaluate the "feasibility of constructing regional irrigation water distribution system(s) and other options to meet the growing urban irrigation demands of this area".

The RIDS study area generally comprises the coastal area (western portion) of the Lower West Coast Region. It includes the Cities of Cape Coral, Fort Myers, and Naples, franchise areas for Florida Water Services, Gulf Environmental Services, and Bonita Springs Utilities, and unincorporated areas of Lee and Collier Counties.

Existing and future (2000 and 2020) wastewater treatment/reclamation facilities and associated infrastructure within the study area were inventoried. The inventory included:

- Existing treatment facilities and infrastructure
- Existing reclaimed water transmission infrastructure
- Current wastewater flows
- Existing reuse and disposal mechanisms and how much reclaimed water/effluent is distributed to each

There are 21 wastewater treatment plants/reclamation facilities of significance (greater than 100,000 gpd) in the study area.

To determine the amount of alternative water sources that will be necessary for future urban irrigation water, an evaluation of service area water demands was performed. The demand analysis was determined on a temporal basis for each service area. The current average demands for Collier and Lee counties respectively are approximately 18.4 and 32.5 MGD, resulting in a total study area demand of 50.9 MGD. Urban irrigation demands for the Year 2020 were projected at 153.5 MGD for Collier County and 194.5 MGD for Lee County for a total demand of 348 MGD.

Alternative sources of supply were determined to address the urban irrigation demands. Additional allocations from resources that are currently stretched, such as groundwater, will be minimized. Therefore, an inventory of potential sources of supply was conducted and prioritized to address future irrigation water needs in the study area. These potential sources of supply are:

- Reclaimed wastewater from municipal wastewater treatment plants
- Water recovered during the dry season from reclaimed water aquifer storage and recovery (ASR) systems recharged during the wet season

- Surface water from streams, rivers, abandoned borrow pits, and canal systems having salinity control structures
- Water recovered during the dry season from surface water ASR systems recharged during the wet season
- Groundwater withdrawal adjacent to surface water sources such as mining pits

These sources provided a total future flow of 213 MGD to offset potable water demands.

Subregions were developed for proposed alternatives. The five subregions are:

1. Cape Coral, Waterway Estates, and North Ft. Myers
2. Ft. Myers Central, Ft. Myers South, Gateway, and Lehigh Acres
3. GES, Fiesta Village, and Ft. Myers Beach
4. North Collier County, Pelican Bay, and Bonita Springs
5. Naples, South Collier County, and Marco Island

In order to develop a preliminary cost estimate associated with the RIDS project, the various potential projects were analyzed on a subregional basis. The costs for each subregion consider the cost of financing the initial project capital costs, including assumptions about potential grant funding, and annual operations and maintenance expenses. These costs are then divided by the expected production of irrigation water resources for the identified projects to determine the unit cost of the irrigation water resources for each subregion. In order to calculate the cost per gallon for each subregion, it was assumed that the total annual production of each project would be approximately equal to 180 days of production based on the project capacity measured on an average daily basis. As shown in the summary below, the unit cost of the irrigation water resources as identified herein range from $0.48 to $0.57 per one thousand gallons.

Summary of Total Costs by Subregion

Subregion	1	2	3	4	5
Cost per 1000 gallons	$0.48	$0.57	$0.52	$0.57	$0.56
Cost per 1000 gallons w/out grant funding	$0.87	$1.03	$0.94	$0.72	$0.67

The costs developed were developed based on funding sources pertaining to each alternative. It was determined that each alternative is eligible for several different funding options including:

- EPA Grants - $2M/Year
- District Grants - $1M/Year
- Governor's Program Grants - $500K/Year
- SRF Loan - Balance of Capital

The implementation of the RIDS program could be facilitated by a number of institutional approaches or frameworks to oversee design, construction, development, funding and operation. It was determined through consensus that individual interlocal agreements on a project-by-project basis, rather than focusing on the RIDS projects as a whole (i.e. Authority or regional utility), would be more manageable by the stakeholders.

After locating the alternatives, an environmental impact assessment was performed to determine any possible detriment to surface water bodies, wetland, and native species that may be affected through the course of developing the RIDS.

Benefits and incentives for the RIDS program are very positive in terms of additional water sources in a high growth area such as the lower west coast of Florida. Overall, the RIDS optimizes existing reclaimed water supplies, maximizes surface water use, diversifies supply sources, reduces water shortage declarations, offsets potable water usage, reduces disposal volumes, and offsets groundwater withdrawals.

Implementation of the RIDS will require additional phases to plan, design, finance and construct the improvements. Assuming Phase 1 included the Master Plan, subsequent phases include the following:

- **Phase 2 Feasibility Study** – Further study of the preferred alternative from the Master Plan to determine pipeline routes, pipe and pump sizes, specific storage locations, materials, detailed costing, detailed scheduling and a focused funding strategy.
- **Phase 3 Engineering Design** – Includes design, permitting and bidding of projects.
- **Phase 4 Construction** – Construction and startup of projects.

Project phases will be implemented on a subregional basis as developed in the RIDS Master Plan.

INTRODUCTION

The objective of the Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region is to develop a program to supply enough water to meet the projected (year 2020) urban irrigation demand for future growth in Lee and Collier counties. Although the area has been progressive in developing alternative supply sources including reclaimed water, these sources will not be adequate to meet future demands. Also, because many of the utilities in the service area have their own discrete infrastructure, there has been no optimization of the resource on a regional basis. Therefore, it has been determined by the South Florida Water Management District (District) that a master plan is required to evaluate these needs.

The RIDS project was one of the recommendations identified in the District's *Lower West Coast Water Supply Plan* (Water Supply Plan) completed in April 2000. The Water Supply Plan recommended the RIDS to evaluate the "feasibility of constructing regional irrigation water distribution system(s) and other options to meet the growing urban irrigation demands of this area".

The purpose of this report is to present the results of the RIDS Master Plan Project.

A series of memoranda were submitted throughout the course of the study in order to ensure that all utilities, local government agencies, project team members, the District and other stakeholders were aware of and involved in the progress of the project.

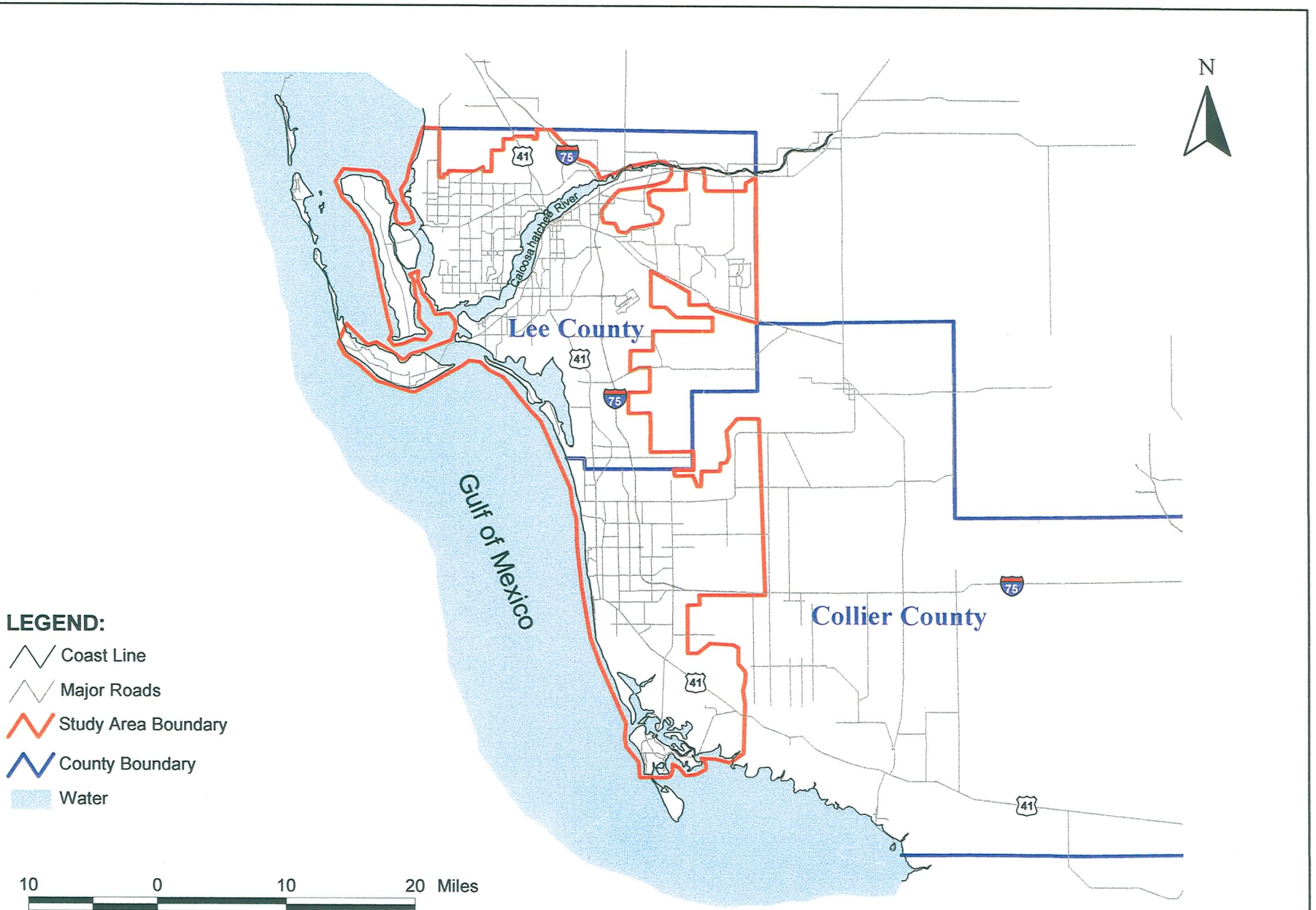
STUDY AREA DEFINITION

The RIDS study area generally comprises the coastal area (western portion) of the Lower West Coast Region. It includes the Cities of Cape Coral, Fort Myers, and Naples, franchise areas for Florida Water Services, Gulf Environmental Services, and Bonita Springs Utilities, and unincorporated areas of Lee and Collier Counties. Sanibel and Pine Island are presented for informational purposes only. The study area is presented in Figure 1.

The study area was developed from the following sources:

- Master plans
- Comprehensive land use plans
- Future growth areas (large developments)

Generally, the study area follows the limits of the projected 2020 service areas and contains approximately 558,000 acres. These 20 service areas are primarily comprised of residential areas, with smaller portions of commercial uses.



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	STUDY AREA	Figure No. 1

FACILITIES INVENTORY

Existing and future (2000 and 2020) wastewater treatment/reclamation facilities and associated infrastructure within the study area were inventoried. The purpose of the inventory includes:

- Identify existing treatment and infrastructure
- Identify reclaimed water transmission infrastructure
- Determine current wastewater flows
- Determine existing reuse and disposal mechanisms and how much reclaimed water/effluent is distributed to each

The basis for the inventory came from local governments, utilities, and the Water Supply Plan.

Flows were generated from Monthly Operating Reports (MORs) submitted for each facility to FDEP in accordance with their permits and from monitoring data provided by the facilities. Flow data mainly came from 2000-2001 data and is denoted in Attachment A.

Wastewater Treatment/Reclamation Facilities

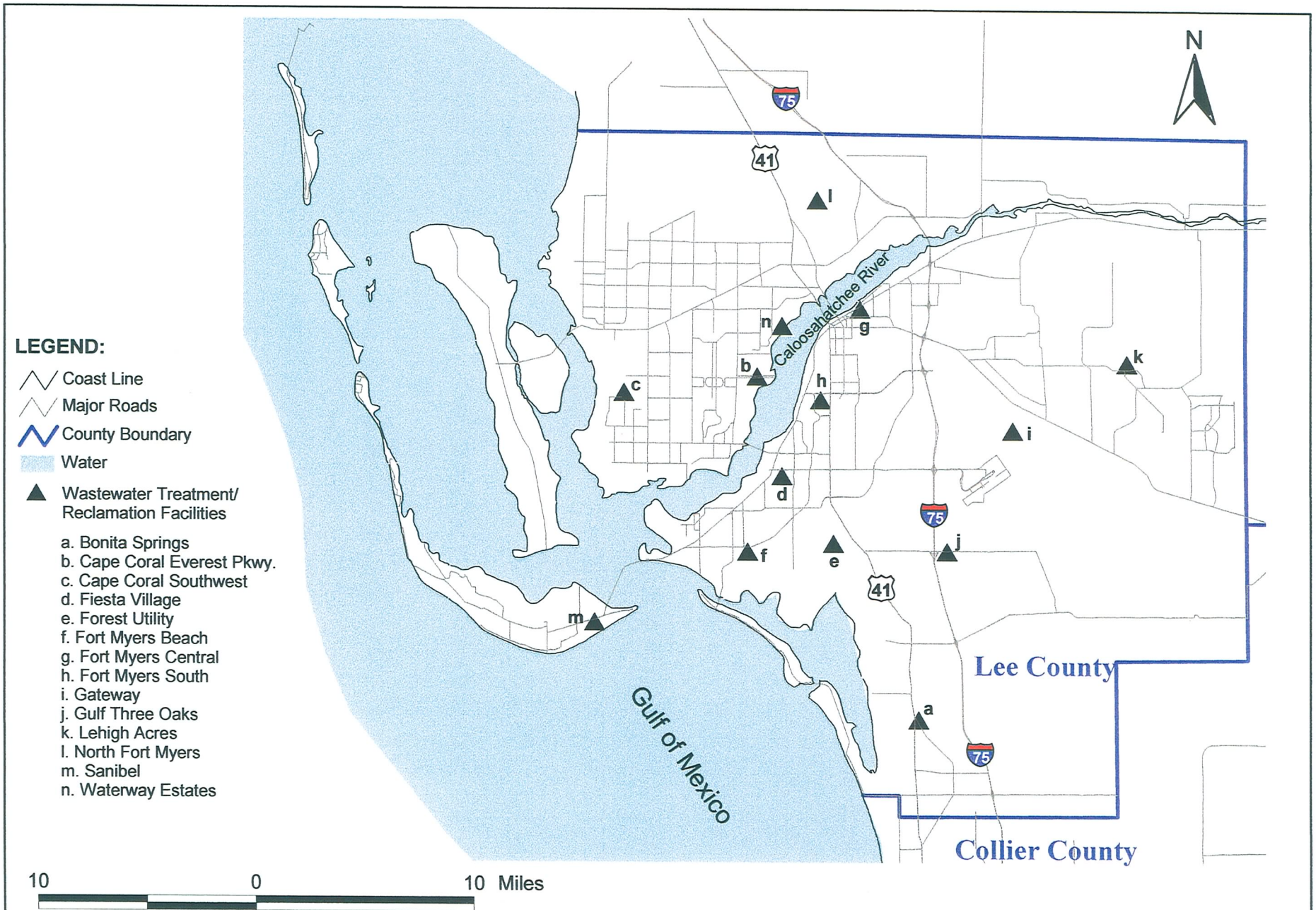
There are 21 wastewater treatment plants/reclamation facilities of significance in the study area. Significant facilities are defined as those with average influent flows of at least 100,000 gallons per day. The facility locations are shown in Figures 2 and 3 for Lee and Collier counties, respectively. Table 1 summarizes the facility information.

The reclaimed water/effluent from the wastewater treatment/reclamation facilities is reused for urban irrigation, commercial uses, and groundwater recharge via percolation ponds, or disposed of via injection wells or discharged to surface water. Table 2 presents the reuse and disposal information from the facilities for the same period of flow listed in Attachment A. Also, Table 3 displays the existing reclaimed water users for the study area.

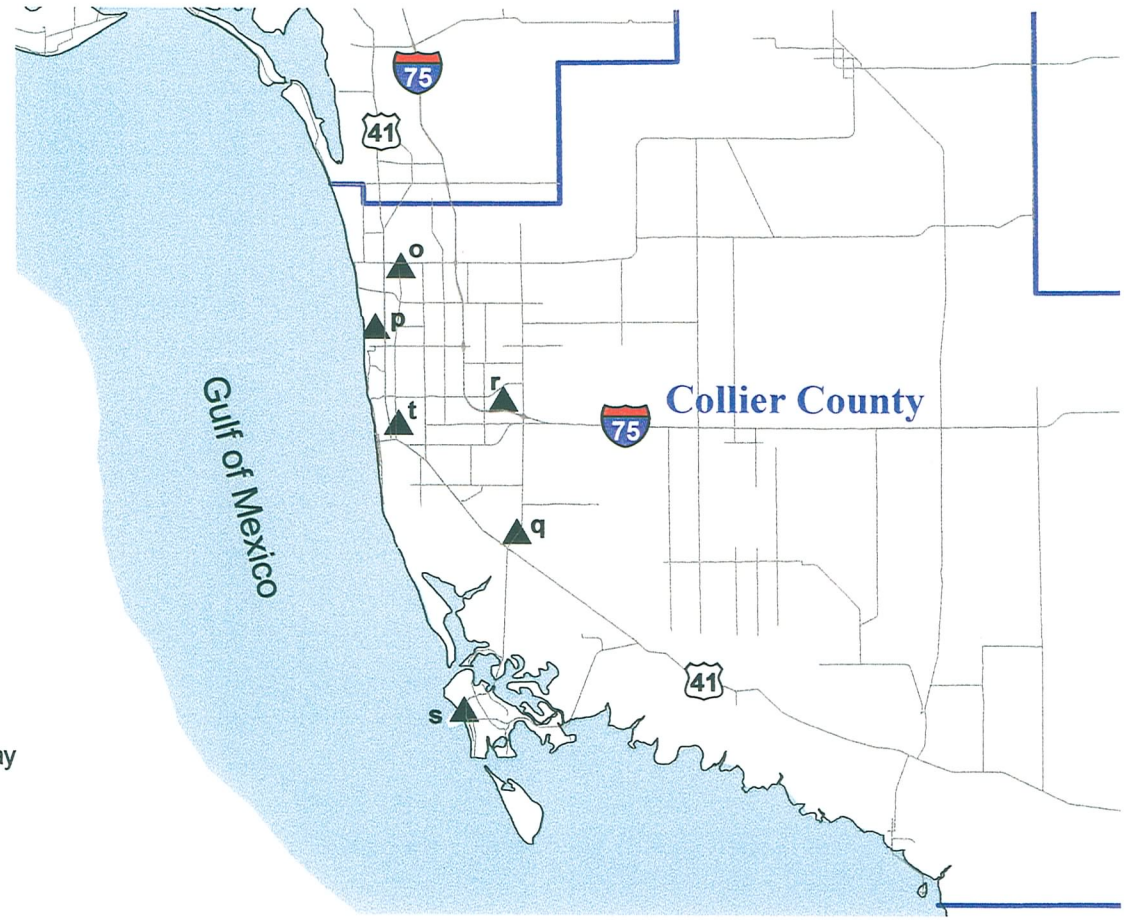
A list of potential end users for the RIDS has been determined based on information received from the local governments and review of information from the Lee County and Collier County planning departments. This will include existing and planned new golf courses, large green space areas, and future large planned residential developments. Table 4 presents the list of potential users.

Reclaimed Water Transmission Facilities

Existing reclaimed water transmission facilities were identified. The focus was primarily on larger pipelines; therefore, distribution systems and smaller lines may not be shown on the maps. Figures 4 and 5 present the existing reclaimed water transmission facilities for Lee and Collier counties, respectively.



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	EXISTING WASTEWATER TREATMENT/RECLAMATION FACILITIES - LEE COUNTY	Figure No. 2



LEGEND:

- Coast Line
- Major Roads
- County Boundary
- Water
- ▲ Wastewater Treatment/ Reclamation Facilities
  - o. Collier County North
  - p. Collier County Pelican Bay
  - q. Collier County South
  - r. Golden Gate
  - s. Marco Island Utilities
  - t. Naples

10 0 10 20 Miles

Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	EXISTING WASTEWATER TREATMENT/RECLAMATION FACILITIES - COLLIER COUNTY	Figure No. 3

Table 1
Wastewater Treatment/Reclamation 2000/2001 Facility Summary

Facility Name	Stakeholder	Service Area Acreage	Permitted Capacity (MGD)	Annual Average Daily Flow (MGD)	Maximum Monthly Flow (MGD)	Minimum Monthly Flow (MGD)
Collier County						
Collier County North/Pelican Bay	Collier County Utilities	54,374	9.5	8.6	10.4	6.9
Collier County South	Collier County Utilities	78,290	8.0	6.4	7.5	5.4
Golden Gate	Gulf Environmental Services/Florida Governmental Utility Authority	2,750	1.0	0.9	1.5	0.8
Marco Island	Florida Water Services	7,368	3.5	2.7	3.4	1.9
Naples	City of Naples Utilities	12,055	10.0	6.7	7.8	5.6
Subtotal		*154,837*	*32.0*	*25.3*	*30.6*	*20.6*
Lee County						
Bonita Springs	Bonita Springs Utilities	36,568	4.3	2.7	3.1	2.1
Everest/Southwest WRF's	Cape Coral Utilities	42,670	15.1	9.5	11.6	8.5
Fiesta Village	Lee County Utilities	9,781	5.0	2.2	2.8	1.8
Forest Utilities	Forest Utilities	1,794	0.5	0.2	0.3	0.2
Ft. Myers Beach	Lee County Utilities	12,954	6.0	3.0	3.8	2.3
Ft. Myers Central	Fort Myers Utilities	13,212	11.0	6.3	12.3	4.4
Ft. Myers South	Fort Myers Utilities	19,069	12.0	6.7	11.5	4.9
Gateway	Gateway Utilities	6,905	0.5	0.3	0.3	0.3
Three Oaks and San Carlos	Gulf Environmental Services	22,363	1.0	1.3	1.6	1.1
Lehigh Acres	Florida Water Services	62,672	2.1	1.2	2.4	0.6
North Ft. Myers	North Fort Myers Utilities	20,653	2.0	1.6	2.6	1.2
Pine Island	Lee County Utilities	795	0.5	0.1	0.2	0.0
Sanibel	Island Water Association	9,779	1.6	0.9	1.0	0.7
Waterway Estates	Lee County Utilities	3,716	1.3	0.9	1.2	0.7
Subtotal		*262,931*	*62.8*	*37.0*	*54.8*	*28.9*
Total		**417,768**	**94.7**	**62.3**	**85.4**	**49.5**

Table 2
Reuse and Disposal 2000/2001 Summary

Facility Name	Disposal Method	Annual Average Daily Flow (MGD)	Maximum Monthly Flow (MGD)	Minimum Monthly Flow (MGD)
Collier Co.				
Collier Co. North/Pelican Bay	Reuse	6.7	8.5	5.3
	Percolation Ponds	0.3	1.6	-
	Deep Well Injection	0.3	1.7	-
Collier Co. South	Reuse	3.5	5.6	1.3
	Surface Water	2.3	5.9	0.6
	Deep Well Injection	0.4	2.2	0.0
Golden Gate	Reuse	0.9	1.5	0.8
	Surface Water	-	-	-
	Deep Well Injection	-	-	-
Marco Island Utilities	Reuse	1.2	1.8	0.3
	Percolation Ponds	-	-	-
	Deep Well Injection	0.8	1.8	0.0
Naples	Reuse	6.1	6.2	6.0
	Surface Water	1.0	1.2	0.8
	Deep Well Injection	-	-	-
Subtotal - Collier	**Reuse**	**18.4**	**23.6**	**13.7**
	Surface Water/Perc. Ponds	**2.59**	**8.6**	**1.3**
	Deep Well Injection	**0.7**	**5.7**	**0.0**
Lee Co.				
Bonita Springs	Reuse	2.6	3.1	1.5
	Wet Weather	0.1	0.5	-
	Deep Well Injection	-	-	-
Cape Coral Utilities	Reuse	21.7	32.5	8.5
	Surface Water	1.3	5.4	-
	Deep Well Injection	-	-	-
Fiesta Village	Reuse	0.9	1.3	0.2
	Surface Water	1.4	2.7	0.7
	Deep Well Injection	-	-	-

Table 2 Reuse and Disposal 2000/2001 Summary				
Facility Name	**Disposal Method**	**Annual Average Daily Flow (MGD)**	**Maximum Monthly Flow (MGD)**	**Minimum Monthly Flow (MGD)**
Forest Utility	Reuse	0.2	0.3	0.2
	Surface Water	-	-	-
	Deep Well Injection	-	-	-
Ft. Myers Beach	Reuse	2.4	3.6	1.2
	Percolation Ponds	0.5	0.5	0.5
	Deep Well Injection	0.3	1.2	-
Ft. Myers Central	Reuse	0.7	0.8	4.4
	Surface Water	5.7	11.7	-
	Deep Well Injection	-	-	-
Ft. Myers South	Reuse	-	-	-
	Surface Water	7.4	12.3	5.8
	Deep Well Injection	-	-	-
Gateway	Reuse	0.3	0.3	0.3
	Surface Water	-	-	-
	Deep Well Injection	-	-	-
Gulf Environmental Services	Reuse	0.8	0.8	0.7
	Surface Water	-	-	-
	Deep Well Injection	-	-	-
Lehigh Acres	Reuse	1.2	2.4	0.6
	Surface Water	-	-	-
	Deep Well Injection	-	-	-
North Ft. Myers	Reuse	0.7	1.1	0.3
	Surface Water	-	-	-
	Deep Well Injection	0.9	1.7	0.3
Pine Island	Reuse	0.1	0.2	0.0
	Surface Water	-	-	-
	Deep Well Injection	-	-	-
Sanibel	Reuse	0.8	1.0	0.7
	Surface Water	0.1	0.2	0.0
	Deep Well Injection	-	-	-
Waterway Estates	Reuse	0.0	0.1	-
	Surface Water	0.8	1.2	0.6
	Deep Well Injection	-	-	-
Subtotal –Lee	**Reuse**	**32.47**	**47.6**	**18.5**

Table 2 Reuse and Disposal 2000/2001 Summary				
Facility Name	Disposal Method	Annual Average Daily Flow (MGD)	Maximum Monthly Flow (MGD)	Minimum Monthly Flow (MGD)
	Surface Water/Wet Weather	17.2	34.4	7.5
	Deep Well Injection	1.2	2.9	0.3
Total Disposal - Lee and Collier				
	Reuse	50.9	71.2	32.2
	Surface Water	19.8	43.0	8.8
	Deep Well Injection	1.9	8.6	0.3

Table 3 Existing Reclaimed Water Users		
	Existing User	**Reuse Demand (MGD)**
Collier County		
Collier Co. North/Pelican Bay		
	Audubon	0.80
	Autumn Woods	0.20
	Calusa Bay	0.10
	Beachwalk Residents Assoc.	0.11
	Collier's Reserve	0.40
	Imperial	0.70
	Palm River	0.70
	Pelican Bay	4.09
	Pelican Marsh	2.60
	St. Croix	0.10
	Tract 21	0.80
	Vineyards Utility	3.00
	Small Users*	0.12
	Subtotal	**13.72**
Collier Co. South		
	Countryside/PCP Venture	0.55
	Foxfire Community Assoc. of Collier Co., Inc.	0.97
	Glades Country Club Apts.	1.90
	Hibiscus Golf Club	0.50
	Lakewood Community Services Assoc., Inc.	1.00
	Lakewood Country Club of Naples, Inc.	0.41
	Lely Development District & GC	2.20
	Riviera Golf Club of Naples, Ltd.	0.66
	Royal Palm Country Club	1.00
	Windstar	0.42
	Subtotal	**9.61**
Golden Gate	Primarily Residential	
Marco Island Utilities	Primarily Residential	
Naples		
	Hole-in-the-Wall Golf Course	0.59
	Moorings Country Club of Naples	0.18
	Wilderness Country Club	0.66
	High Point Country Club	0.12
	Royal Ponciana Golf Club	1.47
	Country Club of Naples	0.50
	Bears Paw Country Club	0.56

Table 3 Existing Reclaimed Water Users		
	Existing User	**Reuse Demand (MGD)**
	Beach Club Golf Course	0.51
	Quail Run Country Club	0.24
	Subtotal	**4.81**
Collier County Subtotal =		**23.33**
Lee County		
Bonita Springs		
	Brooks of Bonita Springs	2.24
	Fountain Lakes	0.52
	Gulf Atlantic	0.96
	Pelican Landing	2.41
	Bonita Bay	2.69
	Cedar Creek	0.73
	Small Users*	0.26
	Subtotal	**9.81**
Cape Coral Everest Pkwy.	Primarily Residential	
Cape Coral Southwest	Primarily Residential	
Fiesta Village	(See Ft. Myers Beach)	
Forest Utility	Primarily Residential	
Ft. Myers Beach		
	Bayside Estates	0.12
	Health Park	0.21
	Summerlin Ridge	0.10
	Myerlee CC	0.14
	Cypress Lake CC	0.20
	McGregor Park Condos	0.09
	Kelly Greens	0.32
	Lexington	0.57
	Gulf Harbour	0.56
	The Landings	0.35
	The Woodlands	0.50
	Crown Colony	0.50
	County Percolation Ponds	0.24
	Small Users*	0.09
	Subtotal	**3.99**
Ft. Myers Central		
	Heritage Palms Golf Course	0.47
	Heritage Palms	0.77
	Eastwood Golf Course	0.56

Table 3 Existing Reclaimed Water Users		
	Existing User	**Reuse Demand (MGD)**
	Ft. Myers Country Club	0.37
	Omni Development	0.42
	Minor Irrigation Users	0.43
	Jack Parker Corp.	0.35
	Jack Parker Corp. Golf Course	0.47
	Sun City Golf Courses	0.70
	Sun City	1.05
	Colonial Golf & Country Club Golf Course	0.29
	Colonial Golf & Country Club Residential	0.57
	Gateway Development	0.84
	Small Users*	0.12
	Subtotal	**7.41**
Ft. Myers South	(See Ft. Myers Central)	
Gateway	Primarily Residential	
Gulf Environmental Services	Primarily Residential	
High Point	Primarily Residential	
Lehigh Acres	Primarily Residential	
North Ft. Myers	Primarily Residential	
Pine Island	Primarily Residential	
Sanibel		
	West Gulf Dr. Condominiums	0.23
	Middle Gulf Dr. Condominiums	0.25
	Small Users*	0.03
	Subtotal	**0.51**
Waterway Estates		
	Lochmoor Country Club	0.30

Lee County Subtotal =	**22.01**

Total Potential Reuse Demand =	**45.35**

*Denotes users that average less than 100,000 gpd

Table 4 Potential Major Irrigation Water Users		
	Potential User	**Reuse Demand (MGD)**
Collier County		
Collier Co. North/Pelican Bay	Stonebridge	0.48
	Pelican Strand/Reg. Village	0.97
	Island Walk	0.95
	Village Walk	0.37
	Wyndemere	0.58
	Kensington	0.64
	Longshore Lakes	0.27
	Grey Oaks	1.55
	Sterling Oaks	0.16
	Woodlands	0.64
	Parklands	0.83
	Bentley Village	0.16
	Quail Creek, Quail Village	1.37
	Quail West	1.16
	Subtotal	**10.13**
Collier Co. South		
	Embassy Woods Golf Course	0.25
	Eagle Creek Golf Course	0.48
	Fiddler's Creek Golf Course	1.61
	Royal Wood Golf Course	0.31
	Naples Heritage Golf Course	0.47
	Whispering Pines Golf Course	0.20
	Area Schools	0.24
	Area Parks	0.76
	Sierra Meadows Subdivision	0.04
	Fiddler's Creek Subdivision	1.21
	Collier DRI Subdivision	0.09
	Ironwood Golf Course	0.12
	Subtotal	**5.76**
Golden Gate	NI	
Marco Island Utilities	NI	
Naples	NI	
Collier County Subtotal =		**15.89**
Lee County		
Bonita Springs		
	Brooks of Bonita Springs	4.49
	Sweetwater Ranch	0.32

Table 4 Potential Major Irrigation Water Users		
	Potential User	**Reuse Demand (MGD)**
	Fountain Lakes	0.54
	Marsh Landing	0.06
	Woodside Lakes	0.17
	Allendale	0.08
	Eldorado Acres	0.09
	Gulf Atlantic	1.41
	Pelican Landing	3.17
	Bonita Bay	3.48
	Cedar Creek	0.11
	Highland Woods	1.01
	Bonita Fairways	0.91
	Vanderbilt Lakes	0.28
	Woods Edge	0.28
	Spanish Wells	1.39
	Imperial Harbor	0.07
	Bonita Golf Estates	1.12
	Woodbridge Wells	0.09
	Southern Pines	0.30
	Bolt Bonita Excavation	0.34
	Citrus Park	0.27
	Bonita Farms	0.00
	Spruce Run	0.51
	Hunters Ridge	0.95
	Worthington	1.01
	Quail West	0.67
	The Parklands	1.74
	Corkscrew Growers	1.72
	Subtotal	**26.58**
Cape Coral Everest Pkwy.	NI	
Cape Coral Southwest	NI	
Fiesta Village	NI (see Ft. Myers Beach)	
Forest Utility	NI	
Ft. Myers Beach		
	Not yet named	3.79
	Parker Lakes	0.20
	Port of Iona/Harbor Isles	0.00
	Pottinger's Nursery	0.02
	Lee Co. Property	0.02

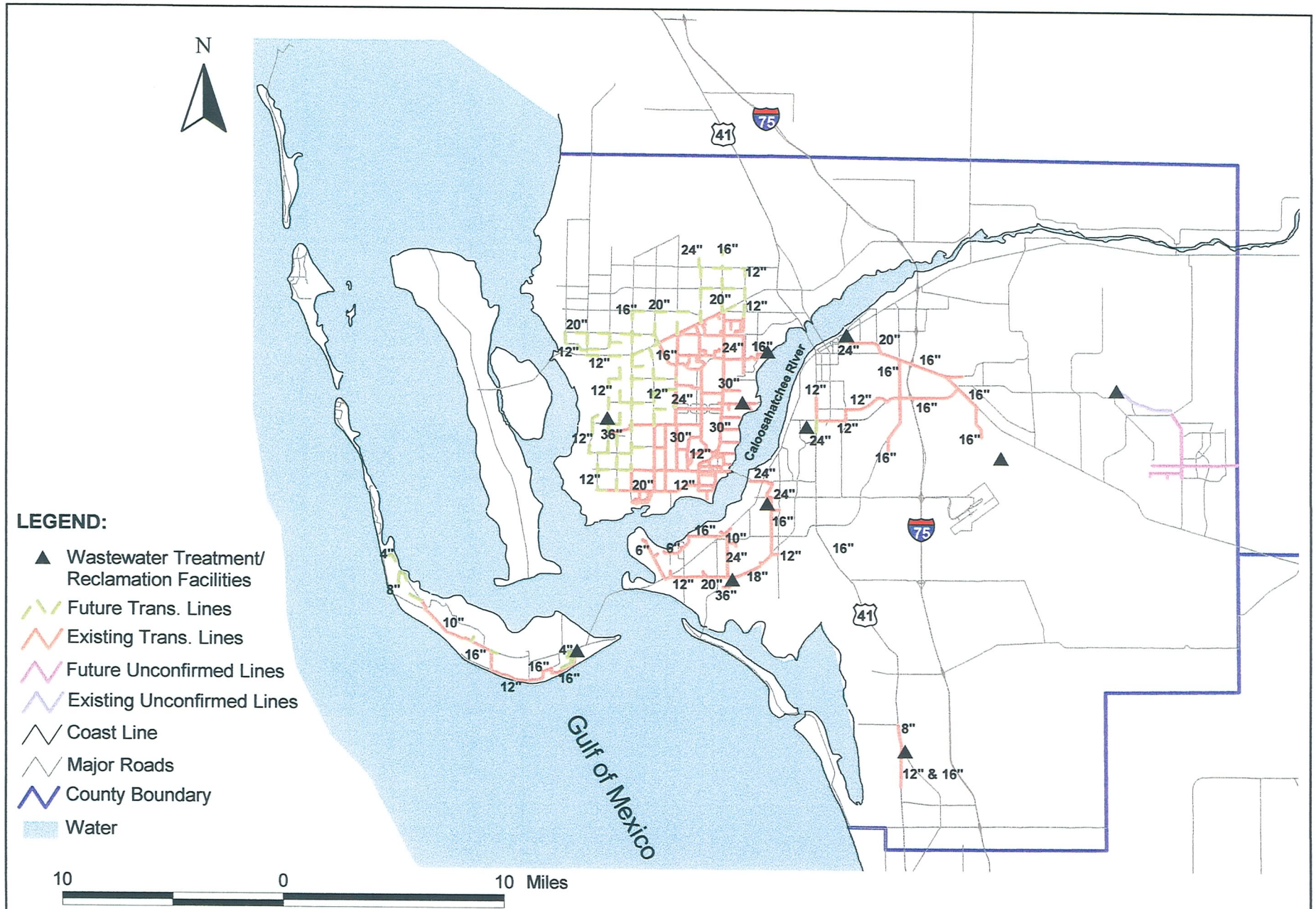
Table 4 Potential Major Irrigation Water Users		
	Potential User	**Reuse Demand (MGD)**
	Waterous Corporation	0.02
	Peppertree Pointe	0.10
	Cypress Cove	0.12
	Gulf View Country Club	0.04
	Principia	0.05
	College Point	0.05
	Edison Community College	0.18
	Heath Park	0.30
	Seven Lakes Golf Course	0.28
	Sandpiper Cove	0.67
	Subtotal	**5.82**
Ft. Myers Central		
	Heritage Palms Golf Course	0.47
	Heritage Palms	0.77
	Eastwood Golf Course	0.56
	Ft. Myers Country Club	0.37
	Centennial Park	0.03
	Omni Development	0.42
	Winkler Road Ext.	0.01
	Ft. Myers Cemetery	0.03
	Little League Ballfield	0.01
	Minor Irrigation Users	0.43
	Red Sox Main Field	0.04
	Jack Parker Corp.	0.35
	Jack Parker Corp. Golf Course	0.47
	Sun City Golf Courses	0.70
	Sun City	1.05
	Colonial Golf & Country Club Golf Course	0.29
	Colonial Golf & Country Club Residential	0.57
	Gateway Development	0.84
	Subtotal	**7.41**
Ft. Myers South	(No reuse at this time)	
Gateway	NI	
Gulf Three Oaks	NI	
High Point	NI	
Lehigh Acres	NI	
North Ft. Myers	NI	
Pine Island	NI	

Table 4 Potential Major Irrigation Water Users		
	Potential User	**Reuse Demand (MGD)**
Sanibel		
	W. Gulf Dr. Condominiums	0.23
	Middle Gulf Dr. Condominiums	0.25
	Baseball Field	0.02
	Church	0.00
	Sanctuary - Wulfert Point	0.06
	Beachview Estates	0.09
	W. Gulf Dr. Residential	0.13
	Subtotal	**0.79**
Waterway Estates		
	El Rio Country Club	0.05

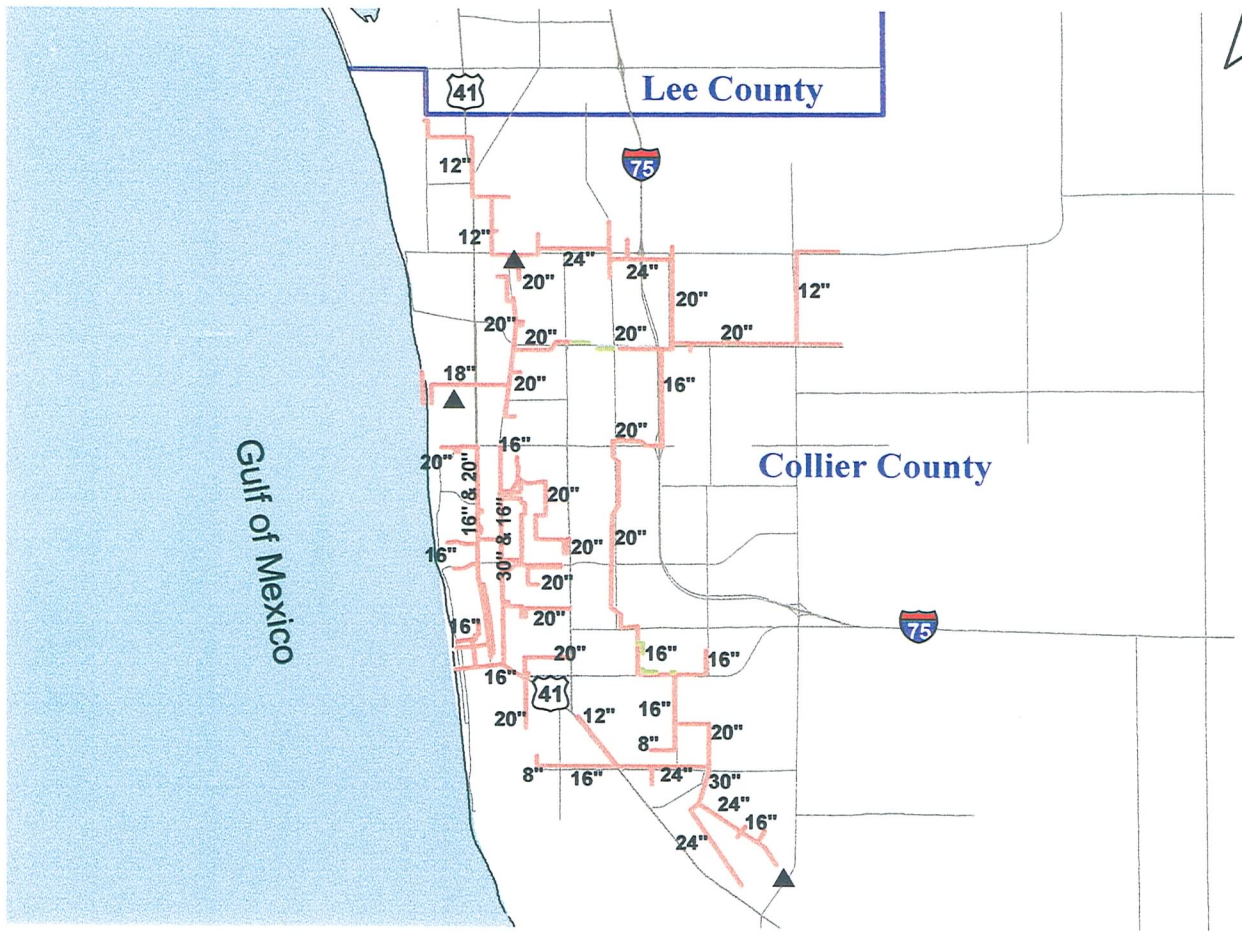
Lee County Subtotal =	**40.65**

Total Potential Reuse Demand =	**56.54**

*NI denotes no information



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE		South Florida Water Management District	RECLAIMED WATER TRANSMISSION LINES - LEE COUNTY	Figure No. 4



LEGEND:

- ▲ Wastewater Treatment/ Reclamation Facilities
- Proposed Trans. Lines
- Existing Trans. Lines
- Coast Line
- Major Roads
- County Boundary
- Water

5 0 5 Miles

Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	**RECLAIMED WATER TRANSMISSION LINES - COLLIER COUNTY**	Figure No. 5

URBAN IRRIGATION WATER DEMANDS

In order to determine the amount of alternative water sources that will be necessary for future urban irrigation water, an evaluation of service area water demands was performed. Figures 6 and 7 delineate the existing service areas for the study area. This evaluation has revealed that significant increases in urban irrigation demands are projected through 2020. It was concluded that in some areas such as Collier County's North and South service areas and Cape Coral in Lee County, historically used groundwater sources and reclaimed water might not be sufficient to support these demands. In addition, the seasonality of demands and potential supplies is limiting the use of some sources. There is 100 percent utilization of reclaimed water supplies in some portions of this project area during the dry months, while there is a surplus during the wet season. It was determined that additional sources of water do exist in the study area to offset a portion of the projected irrigation demands, mainly from surface water and reclaimed water expansions. It is clear that storage will be an integral component of this project that will be necessary to span the gap between the seasonal variability of wet weather surpluses and dry season deficits. Figures 8 and 9 present the future wastewater service areas.

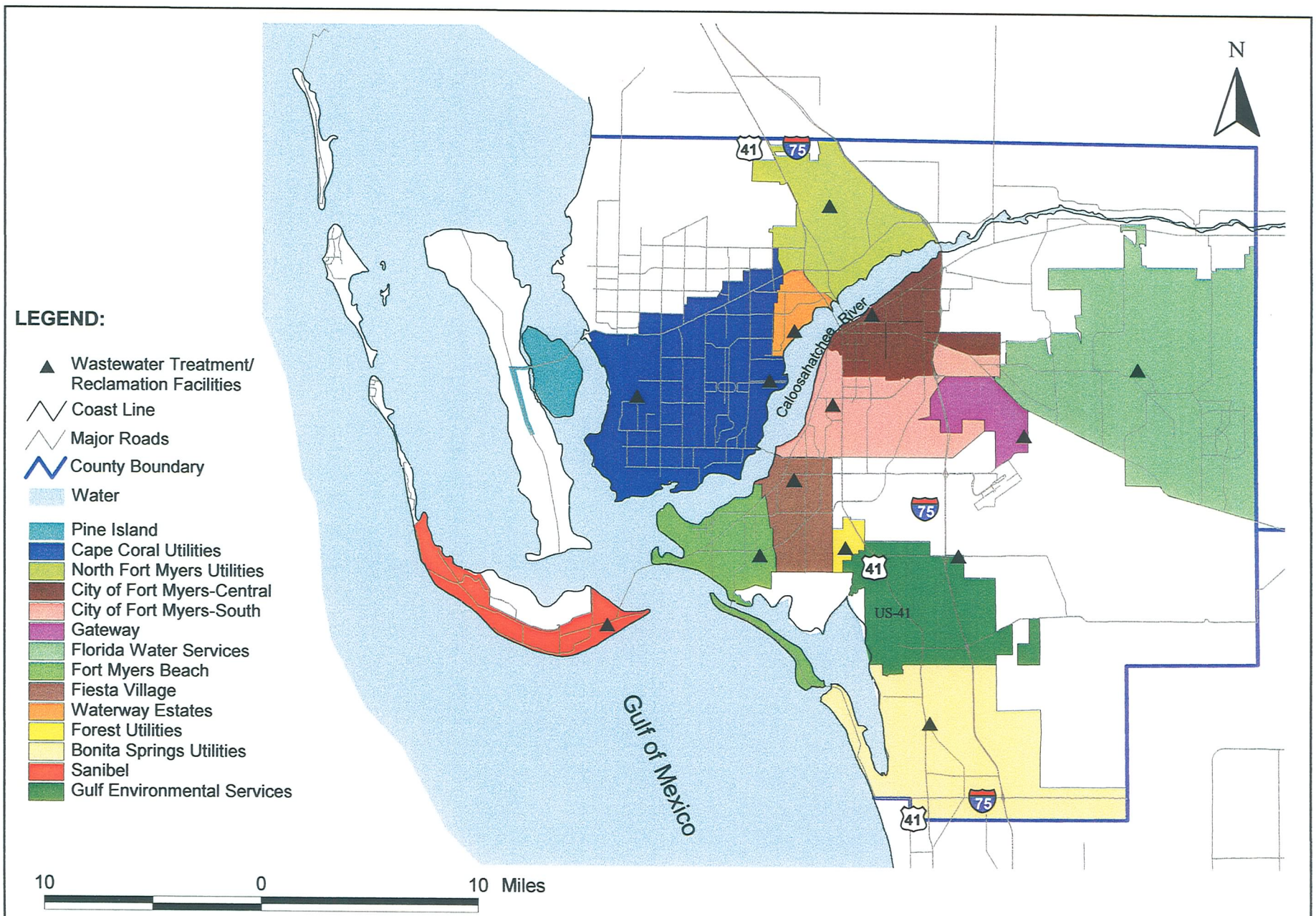
Permanent population projections for each service area were developed from a variety of sources including franchise or utility-supplied data. Most of the population projections extended through 2020, but for those that did not, a linear regression was performed using the available data. Table 5 presents the current and future population projections and the source of information for each service area.

It was assumed that the supply was equivalent to the projected influent wastewater flow. The supplies were calculated by taking the current wastewater flows and dividing by the service area population. This resulted in a per capita wastewater generation factor. These monthly factors were then multiplied by the projected 2020 population. As a result, the temporal variability was accounted for in the future projections. Tables 6 and 7 display the current and future (2020) reclaimed water supply.

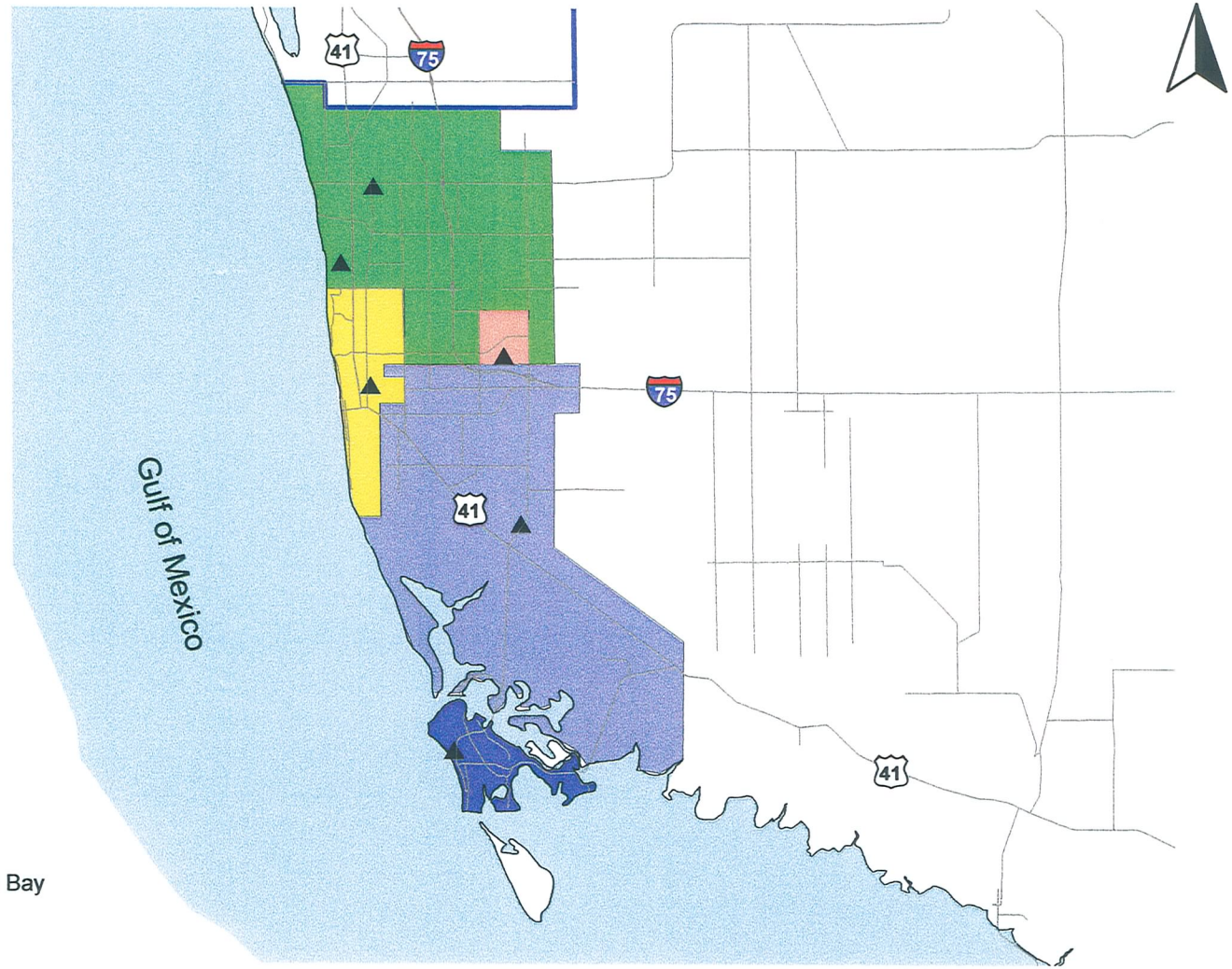
The population for Collier County is predicted to increase by approximately 69% over the next 20 years, while the Lee County population is expected to experience 81% growth. This results in an overall study area growth of 76%.

The urban irrigation water demands were developed using both actual demand data and the modified Blaney-Criddle (B-C) model as provided by the District. The B-C methodology is explained in Attachment B. The demands were generated for the 1-in-10 year drought event, meaning that there is a probability of such a drought occurring once in every ten years. The B-C modeling analysis is included in Attachment C. The following input variables were used to determine the B-C urban irrigation water demands:

- Rainfall Station: Naples or Ft. Myers
- Irrigation System: Sprinkler
- Crop: Turf Grass
- Irrigable Acreage: Calculated for each service area
- Soil Type: Collier, 0.4 and Lee, 0.8 (based on Figures C-8 and C-4 from the Management of Water Use Permitting Information Manual, Vol. III)



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	EXISTING WASTEWATER SERVICE AREAS - LEE COUNTY	Figure No. 6

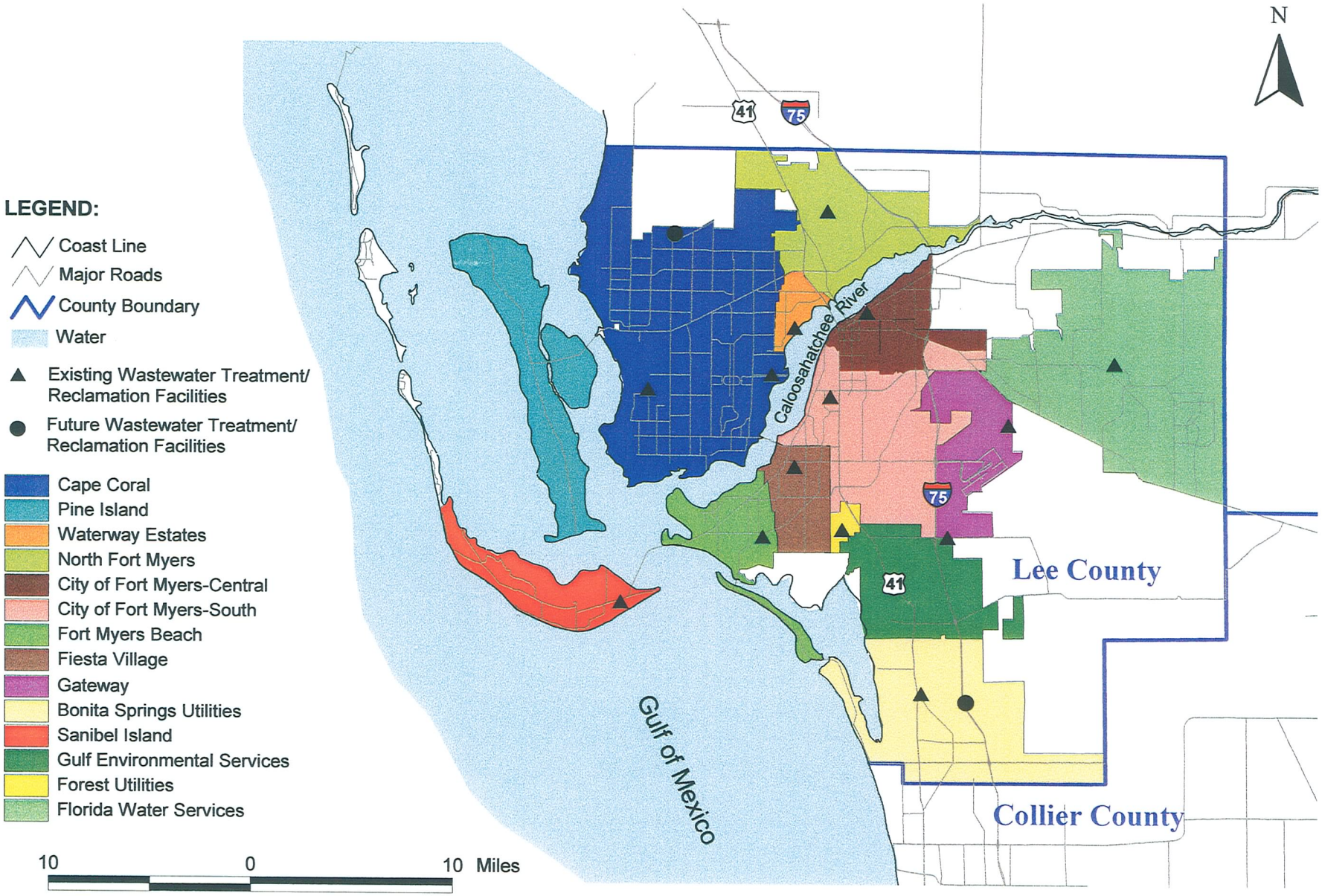


LEGEND:

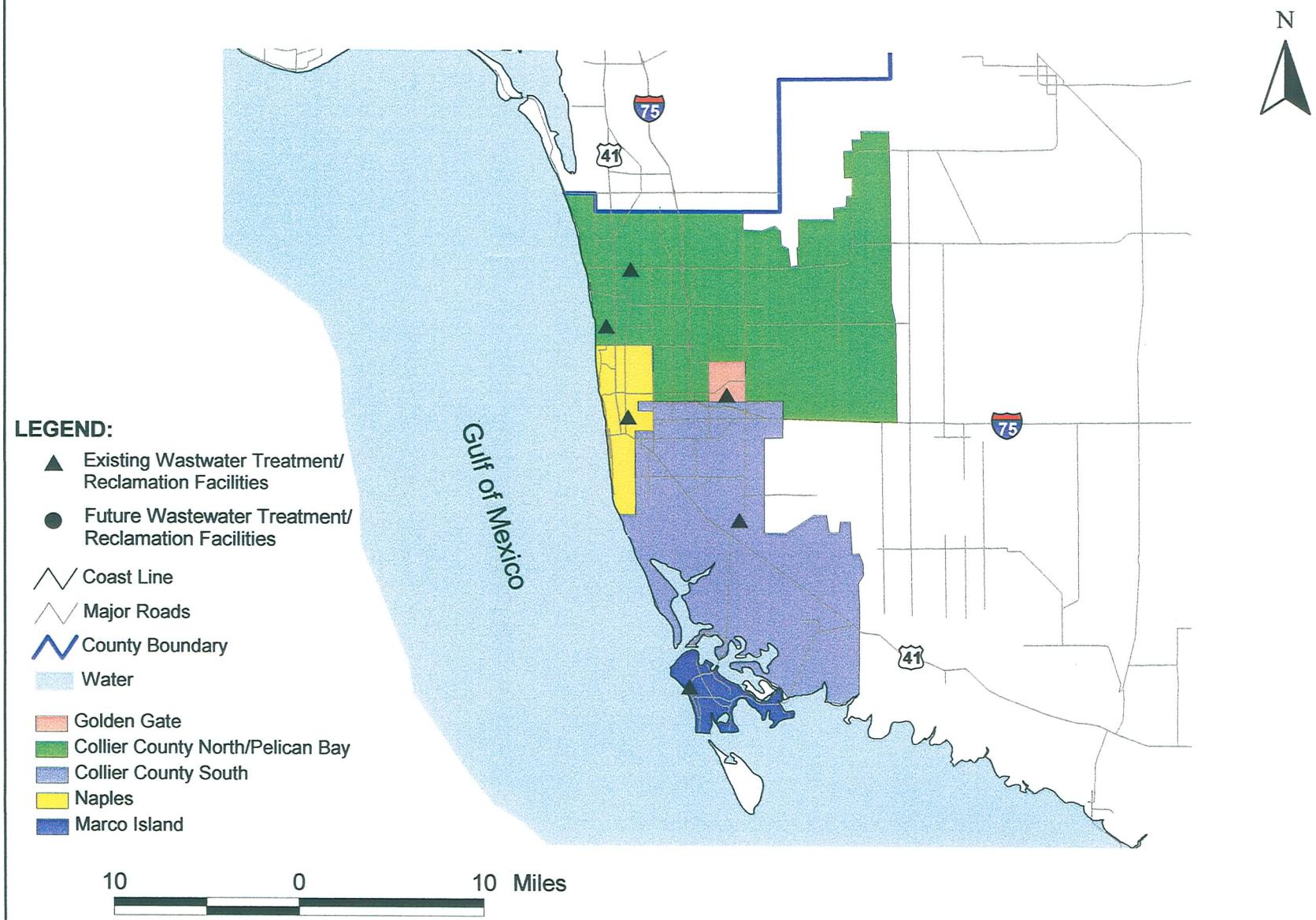
- Coast Line
- Major Roads
- County Boundary
- Water
- ▲ Wastewater Treatment/ Reclamation Plants
- Golden Gate
- Collier County North/Pelican Bay
- Naples
- Collier County South
- Marco Island

10 0 10 Miles

Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	EXISTING WASTEWATER SERVICE AREAS - COLLIER COUNTY	Figure No. 7



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE		South Florida Water Management District	FUTURE WASTEWATER SERVICE AREAS - LEE COUNTY	Figure No. 8



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	FUTURE WASTWATER SERVICE AREAS - COLLIER COUNTY	Figure No. 9

Table 5
Population Projections

Facility/Service Area	Population '99/'00	Population 2020	Source
Collier County			
Collier Co. North/Pelican Bay	61,694	137,912	2001 Collier Co. Master Plan Report
Collier Co. South	64,829	145,705	2001 Collier Co. Master Plan Report
Golden Gate	20,951	20,951	2001 Collier Co. Master Plan Report
Marco Island Utilities	12,670	18,806	2001 Collier Co. Master Plan Report
Naples	31,926	36,931	2002 Reclaimed Water Master Plan
Miscellaneous Collier Co.	21,692	47,557	2001 Collier Co. Master Plan Report
Subtotal	**213,762**	**360,305**	
Lee County			
Bonita Springs	33,900	63,808	2001 Bonita Springs Tech Memo 3
Cape Coral Utilities	73,840	176,581	City of Cape Coral Utility Master Plan Update and 2002 WUP
Fiesta Village	22,200	39,291	Current determined from monthly flows assuming 100 GPCD, Future determined using Update to Water Supply Master Plan (2000)
Forest Utility	2,500	2,500	Determined from monthly flows assuming 100 GPCD
Ft. Myers Beach	45,173	62,819	Lee County Planning Community Web Map
Ft. Myers Central	26,530	36,893	Lee County Planning Community Web Map (also taking into account service area acreage for a better estimate)
Ft. Myers South	47,780	55,764	Lee County Planning Community Web Map (also taking into account service area acreage for a better estimate)
Gateway	3,020	10,585	Lee County Planning Community Web Map
Gulf Environmental Services	13,484	33,140	Taken from the Lower West Coast Water Supply Plan ('00 from Planning Community Web Map)
Lehigh Acres	22,382	91,734	Lee County Planning Community Web Map - a hand calculation was performed utilizing EDUs (from '99 Lehigh Acres Wastewater Treatment Plant Permit Modification and Reuse Engineering Report) to determine the sewered population
North Ft. Myers	50,301	55,764	Lee County Planning Community Web Map
Pine Island	8,687	12,280	Lee County Planning Community Web Map
Sanibel	6,482	7,691	2001 Sanibel Reuse Implementation Report
Waterway Estates	7,768	8,603	Lee County Regional Water Supply Authority Update to Water Supply Master Plan 2000-2030
Subtotal	**364,047**	**657,453**	
Total	**577,809**	**1,017,758**	

Table 6
Reclaimed Water Supply – Current

Facility	Monthly Flows (MGD)												Average (MGD)	Annual Total (MGY)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec		
Collier Co.														
Collier Co. North[d]	9.6	10.0	10.4	9.1	7.7	7.1	6.9	7.8	8.6	8.4	9.1	8.9	8.6	3,150.9
Collier Co. South[d]	6.7	7.0	6.9	6.4	5.5	5.4	5.6	6.3	7.5	6.5	6.6	6.3	6.4	2,329.5
Golden Gate[b]	0.9	0.8	0.8	0.8	0.8	0.8	1.0	0.9	1.5	0.9	0.8	0.9	0.9	331.1
Marco Island Utilities[b]	2.5	3.1	3.4	2.7	3.0	3.1	2.9	3.2	1.9	2.1	2.1	2.0	2.7	974.2
Naples[b]	6.7	6.9	7.3	6.8	5.6	5.8	7.8	7.1	6.8	6.7	6.8	6.7	6.7	2,458.3
Subtotal	**26.4**	**27.9**	**28.8**	**25.8**	**22.5**	**22.2**	**24.2**	**25.2**	**26.3**	**24.6**	**25.3**	**24.8**	25.3	9,243.9
Lee Co.														
Bonita Springs[i]	2.9	2.9	3.1	2.8	2.3	2.1	2.5	2.4	3.1	2.8	2.9	3.0	2.7	997.6
Cape Coral Utilities[c,d]	9.1	8.7	9.0	8.8	8.5	9.7	10.6	10.6	11.6	9.5	9.0	8.6	9.5	3,456.2
Fiesta Village[d]	2.3	2.4	2.3	2.1	1.8	1.9	2.2	2.3	2.8	2.3	2.1	2.0	2.2	808.9
Forest Utility[b]	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	90.9
Ft. Myers Beach[d]	3.3	3.8	3.8	3.2	2.3	2.5	2.6	2.7	3.1	2.7	3.1	2.9	3.0	1,099.8
Ft. Myers Central[e]	4.4	4.9	5.1	5.2	4.9	5.5	7.6	9.0	12.3	7.1	5.3	4.8	6.3	2,314.1
Ft. Myers South[e]	5.5	5.5	5.8	5.7	4.9	5.4	7.8	9.6	11.5	7.0	5.8	5.5	6.7	2,437.3
Gateway[d]	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	107.2
Gulf Environmental Services[b]	1.4	1.6	1.6	1.4	1.2	1.2	1.3	1.3	1.6	1.1	1.3	1.3	1.3	492.2
Lehigh Acres[b]	0.9	0.8	0.8	0.8	0.6	0.8	1.1	1.7	2.4	2.0	1.2	1.2	1.2	438.4
North Ft. Myers[b]	1.4	1.4	1.3	1.4	2.6	1.2	2.0	1.9	2.0	1.8	1.3	1.3	1.6	593.1
Pine Island[f,g]	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	37.5
Sanibel[h]	0.8	0.9	1.0	1.0	0.7	0.9	1.0	0.9	0.9	0.8	0.8	0.8	0.9	319.3
Waterway Estates[d]	0.9	0.7	0.8	0.7	0.7	0.8	0.9	1.1	1.2	1.0	0.8	0.8	0.9	318.6
Subtotal	**33.5**	**34.1**	**35.4**	**33.9**	**31.2**	**32.4**	**40.4**	**44.3**	**53.1**	**38.9**	**34.2**	**32.9**	37.0	13,511.1
Total Monthly Flow (MGD)	**59.9**	**62.0**	**64.1**	**59.6**	**53.7**	**54.6**	**64.6**	**69.4**	**79.5**	**63.5**	**59.5**	**57.7**	**62.3**	**22,755.0**

a. This data displays 1999 flows from Oct.- Dec. and 2000 flows for Jan. - Sept.

b. This data was taken from Monthly Operating Reports submitted to the Dept. of Environmental Protection (Jan - Sept '01, Oct - Dec '00)

c. Influent Cape Coral data combines the flow from Cape Coral Everest and Cape Coral Southwest WWTPs

d. 2000 data

e. This data displays 2000 data from Oct. - Dec. and 2001 flows for Jan. - Sept.

f. 2001 data (this plant just opened in Feb. of 2001)

g. 2001 data from Feb.- Sept. w/ supplemental data from Matlacha WWTP (now closed)

h. 1999 data

i. 2001 data

* The Highpoint WWTP was deleted from the study due to its small flows and lack of data

Table 7
Reclaimed Water Supply – Future

Facility	Monthly Flows (MGD)												Average (MGD)	Annual Total (MGY)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec		
Collier Co.														
Collier Co. North	21.4	22.4	23.2	20.3	17.1	15.8	15.5	17.5	19.3	18.8	20.2	20.0	19.3	7,043.5
Collier Co. South	15.1	15.6	15.6	14.3	12.3	12.2	12.6	14.0	16.9	14.5	14.8	14.1	14.3	5,235.5
Golden Gate	0.9	0.8	0.8	0.8	0.8	0.8	1.0	0.9	1.5	0.9	0.8	0.9	0.9	331.1
Marco Island Utilities	4.5	5.6	6.0	4.7	5.3	5.6	5.2	5.7	3.3	3.8	3.8	3.7	4.8	1,740.1
Naples	7.8	8.0	8.4	7.9	6.4	6.7	9.0	8.2	7.9	7.7	7.8	7.8	7.8	2,843.7
Subtotal	**49.7**	**52.5**	**54.1**	**48.1**	**41.9**	**41.1**	**43.3**	**46.2**	**48.9**	**45.8**	**47.4**	**46.3**	**47.1**	**17,193.8**
Lee Co.														
Bonita Springs	5.4	5.5	5.8	5.3	4.3	4.0	4.6	4.6	5.8	5.3	5.5	5.6	5.1	1,877.8
Cape Coral Utilities	21.7	20.8	21.6	21.0	20.3	23.2	25.3	25.3	27.7	22.8	21.5	20.5	22.6	8,265.3
Fiesta Village	4.0	4.3	4.1	3.8	3.3	3.3	3.9	4.1	5.0	4.1	3.7	3.6	3.9	1,431.7
Forest Utility	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	90.9
Ft. Myers Beach	4.5	5.3	5.3	4.5	3.2	3.5	3.6	3.7	4.4	3.8	4.3	4.1	4.2	1,529.4
Ft. Myers Central	6.2	6.8	7.1	7.3	6.9	7.6	10.6	12.4	17.1	9.9	7.3	6.6	8.8	3,218.0
Ft. Myers South	6.4	6.4	6.8	6.7	5.7	6.3	9.2	11.2	13.4	8.2	6.7	6.4	7.8	2,844.6
Gateway	1.0	0.9	1.0	0.9	1.0	1.0	1.0	1.2	1.1	1.1	1.1	1.1	1.0	375.7
Gulf Environmental Services	3.4	3.8	3.8	3.5	3.0	2.9	3.2	3.3	3.8	2.8	3.1	3.1	3.3	1,209.6
Lehigh Acres	3.6	3.4	3.2	3.3	2.5	3.2	4.7	7.1	10.0	8.4	4.8	5.0	4.9	1,796.7
North Ft. Myers	1.6	1.5	1.4	1.5	2.9	1.3	2.2	2.1	2.2	2.0	1.5	1.5	1.8	657.5
Pine Island	0.1	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	53.1
Sanibel	1.0	1.1	1.2	1.2	0.8	1.0	1.2	1.1	1.0	0.9	1.0	0.9	1.0	378.9
Waterway Estates	1.0	0.8	0.9	0.8	0.8	0.8	1.0	1.2	1.4	1.1	0.9	0.9	1.0	352.8
Subtotal	**60.2**	**60.8**	**62.8**	**60.1**	**55.0**	**58.4**	**70.9**	**77.8**	**93.3**	**70.7**	**61.8**	**59.8**	**66.0**	**24,081.8**
Total Monthly Flow (MGD)	**109.8**	**113.3**	**116.9**	**108.2**	**97.0**	**99.5**	**114.2**	**124.0**	**142.2**	**116.5**	**109.2**	**106.2**	**108.2**	**39,493.5**

*Future supply was calculated using per capita usage for current supply data and 2020 projected populations.

Table 8
1-in-10 Year Drought Rainfall Values (inches)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Collier	1.5	1.6	0.1	0.7	3.0	5.6	6.8	7.2	7.5	3.6	1.2	1.0
Lee	1.3	1.7	0.3	0.7	2.9	7.2	6.8	7.4	8.0	2.4	1.2	1.3

The irrigable acreage for each service area was developed to generate the monthly urban irrigation. There are two main components of the irrigable area including developed (residential and to a lesser extent, commercial) and open space areas (typically golf courses). Based on experience in Cape Coral and other reuse systems, a factor of 0.075 irrigable acres per capita was used for the developed areas. The open space irrigable areas, consisting of historical golf course acreage, were then added to the developed irrigable acreage, which results in the total irrigable acreage for each service area. The outcome is a percentage of irrigable acreage per total acreage of approximately 10 to 35 percent depending on the service area. This is a realistic percentage for a mixed-use area that has a higher residential coverage, but also includes non-developable coverage that does not require any significant irrigation needs such as wetlands, surface water, and retail/commercial areas. Tables 9 and 10 present the irrigable acreage used to determine the service area demands. It is important to note that future water conservation efforts such as Xeriscape™ landscaping, irrigation hours, and other mandatory ordinances may decrease the demand projections displayed here. These factors were not taken into consideration for this analysis.

It was determined that the B-C method alone does not realistically predict the irrigation demand, especially in terms of a normal temporal distribution in southwest Florida. With heavy local rainfall and an elevated water table, the demand for reclaimed water typically decreases drastically during the wet season months. The patterns displayed by the B-C model contradict these facts. For this reason, an alternative method was developed for determining irrigation demands for this project. Reuse factors (ratio of monthly reuse demand to annual average reuse demand) were determined for each service area using the flow data supplied by each franchise. For certain service areas that did not show an appropriate distribution, factors from a representative service area were used. These factors were then applied to the annual average demand supplied by the B-C model to create future demand projections. The reuse factors described above are included in the methodology for Attachment B. Other sources of supply and demand, including potential users and alternative options are presented in Attachment D.

The demand analysis was determined on a temporal basis for each service area. Tables 11 and 12 present the monthly demands for each service area. Figures 10 through 13 present the demands on a geographic basis.

In Table 11 it is illustrated that the current average demands for Collier and Lee counties respectively are approximately 18.4 and 32.5 MGD, resulting in a total study area demand of 50.9 MGD. Table 12 shows the corresponding demands for the future service areas. Collier and Lee counties project an average of roughly 730% and 400% increase respectively between 2000 and 2020 resulting in an estimated 580% increase overall for the same time period. Taking into consideration the anticipated growth of such areas as Cape Coral, Bonita Springs, and much of Collier County, these estimates appear to be reasonable.

Table 9
Irrigable Acreage – Current

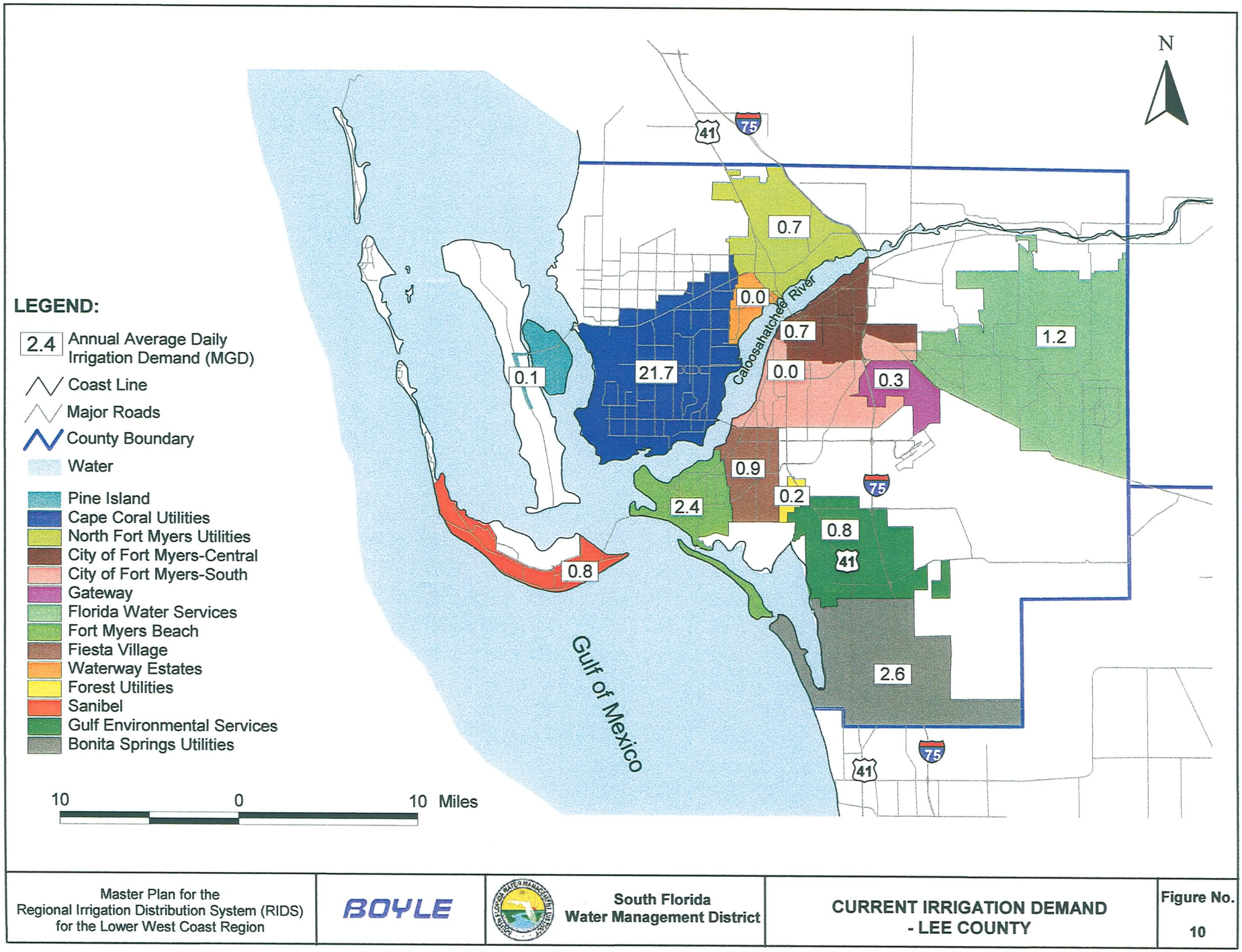
Facility Inventory	Total Acreage	Developed Irrigable Acreage	Open Space Irrigable Acreage	Total Irrigable Acreage
Collier Co.				
Collier Co. North & Pelican Bay	54,374	4,627	3,170	7,797
Collier Co. South	78,290	4,862	4,198	9,060
Golden Gate	2,750	1,571	163	1,734
Marco Island Utilities	7,368	790	265	1,055
Naples	12,055	2,394	974	3,368
Subtotal	**154,837**	**14,245**	**8,770**	**23,014**
Lee Co.				
Bonita Springs	36,568	2,543	1,022	3,565
Cape Coral Utilities	42,670	5,538	1,191	6,729
Fiesta Village	9,781	1,665	272	1,937
Forest Utility	1,794	188	51	239
Ft. Myers Beach	12,954	3,388	360	3,748
Ft. Myers Central	13,212	1,990	368	2,357
Ft. Myers South	19,069	3,584	537	4,120
Gateway	6,905	227	191	418
Gulf Environmental Services	22,363	1,011	625	1,636
Lehigh Acres	62,672	1,679	1,750	3,429
North Ft. Myers	20,653	3,773	581	4,354
Pine Island	795	652	22	674
Sanibel	9,779	486	272	758
Waterway Estates	3,716	583	103	686
Subtotal	**262,931**	**27,304**	**7,347**	**34,650**

Total	**417,768**	**41,548**	**16,116**	**57,665**

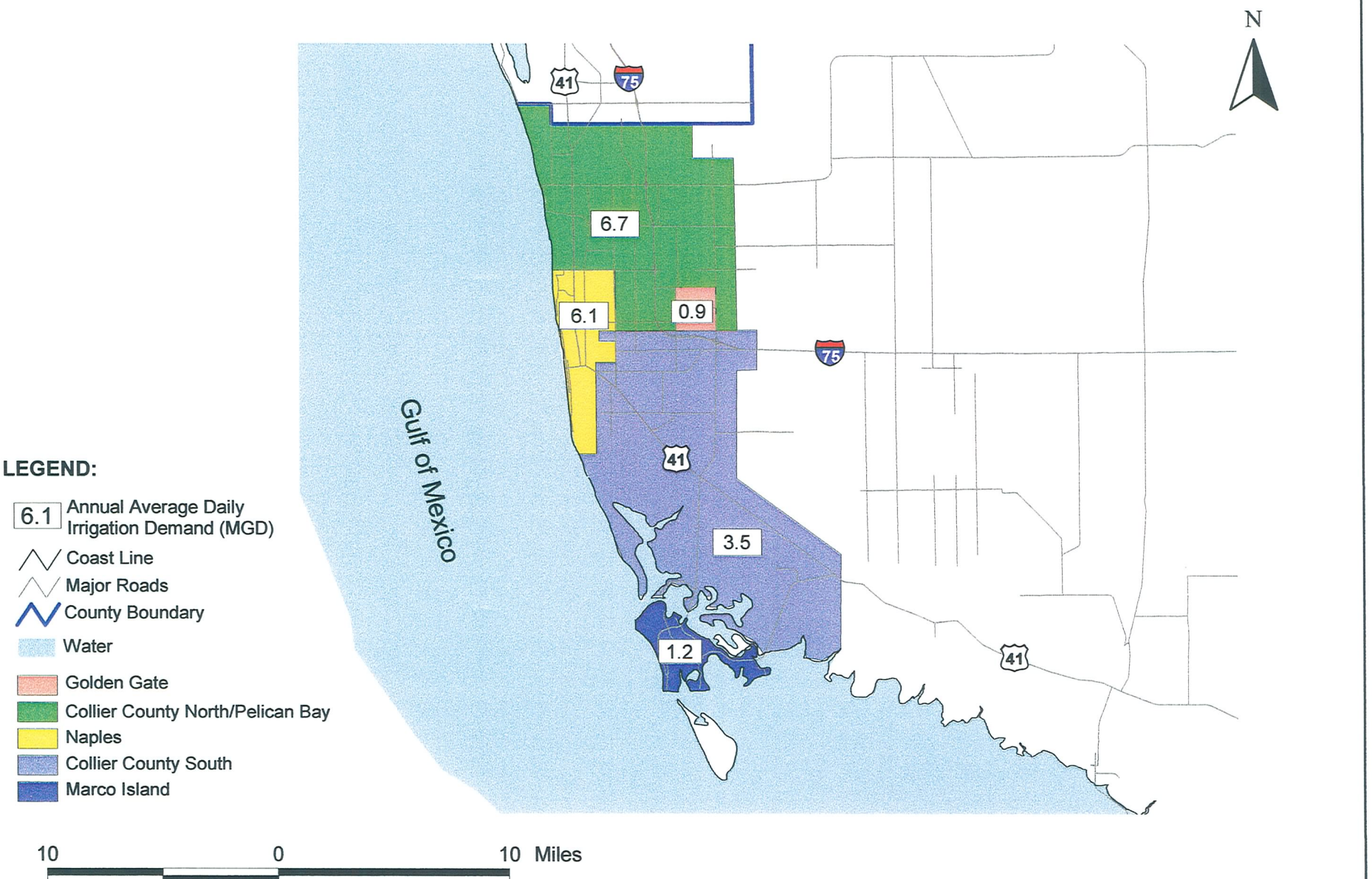
Table 10
Irrigable Acreage – Future

Facility Inventory	Total Acreage - Future	Developed Irrigable Acreage	Open Space Irrigable Acreage	Total Irrigable Acreage
Collier Co.				
Collier Co. North & Pelican Bay	109,861	10,343	5,346	15,690
Collier Co. South	86,251	10,928	4,198	15,126
Golden Gate	2,750	1,571	163	1,734
Marco Island Utilities	7,368	1,410	361	1,772
Naples	12,055	2,770	974	3,744
Subtotal	**218,284**	**27,023**	**11,043**	**38,066**
Lee Co.				
Bonita Springs	36,568	4,786	1,022	5,808
Cape Coral Utilities	73,515	13,244	1,902	15,146
Fiesta Village	9,781	2,947	272	3,219
Forest Utility	1,794	188	51	239
Ft. Myers Beach	12,954	4,711	360	5,072
Ft. Myers Central	13,212	2,767	368	3,135
Ft. Myers South	31,302	4,182	810	4,992
Gateway	15,942	794	414	1,208
Gulf Environmental Services	22,363	2,486	625	3,111
Lehigh Acres	62,672	6,880	1,750	8,630
North Ft. Myers	20,653	4,182	581	4,763
Pine Island	21,193	921	546	1,467
Sanibel	13,984	577	361	938
Waterway Estates	3,716	645	103	748
Subtotal	**339,648**	**49,309**	**9,166**	**58,475**

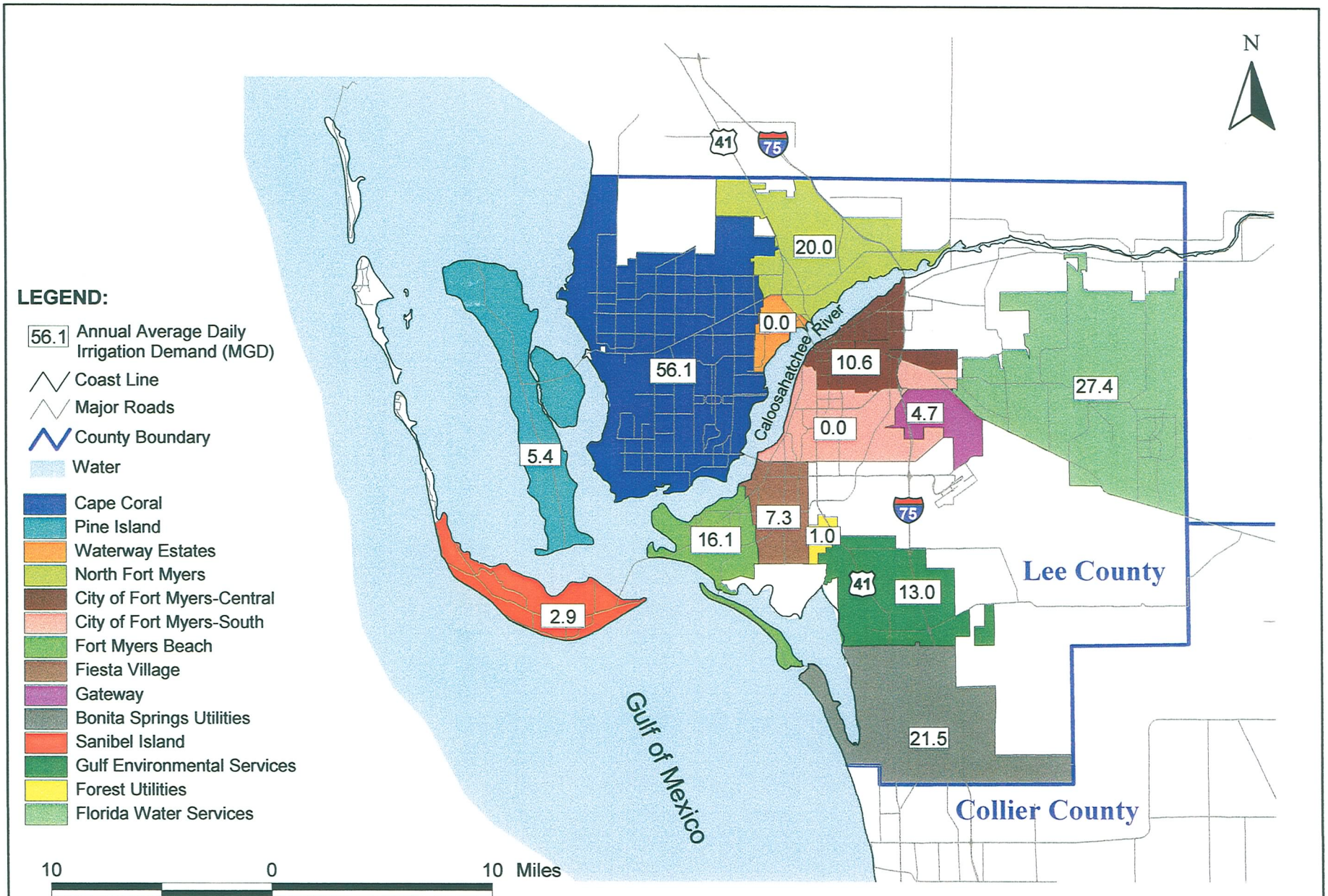
Total	**557,932**	**76,332**	**20,209**	**96,541**



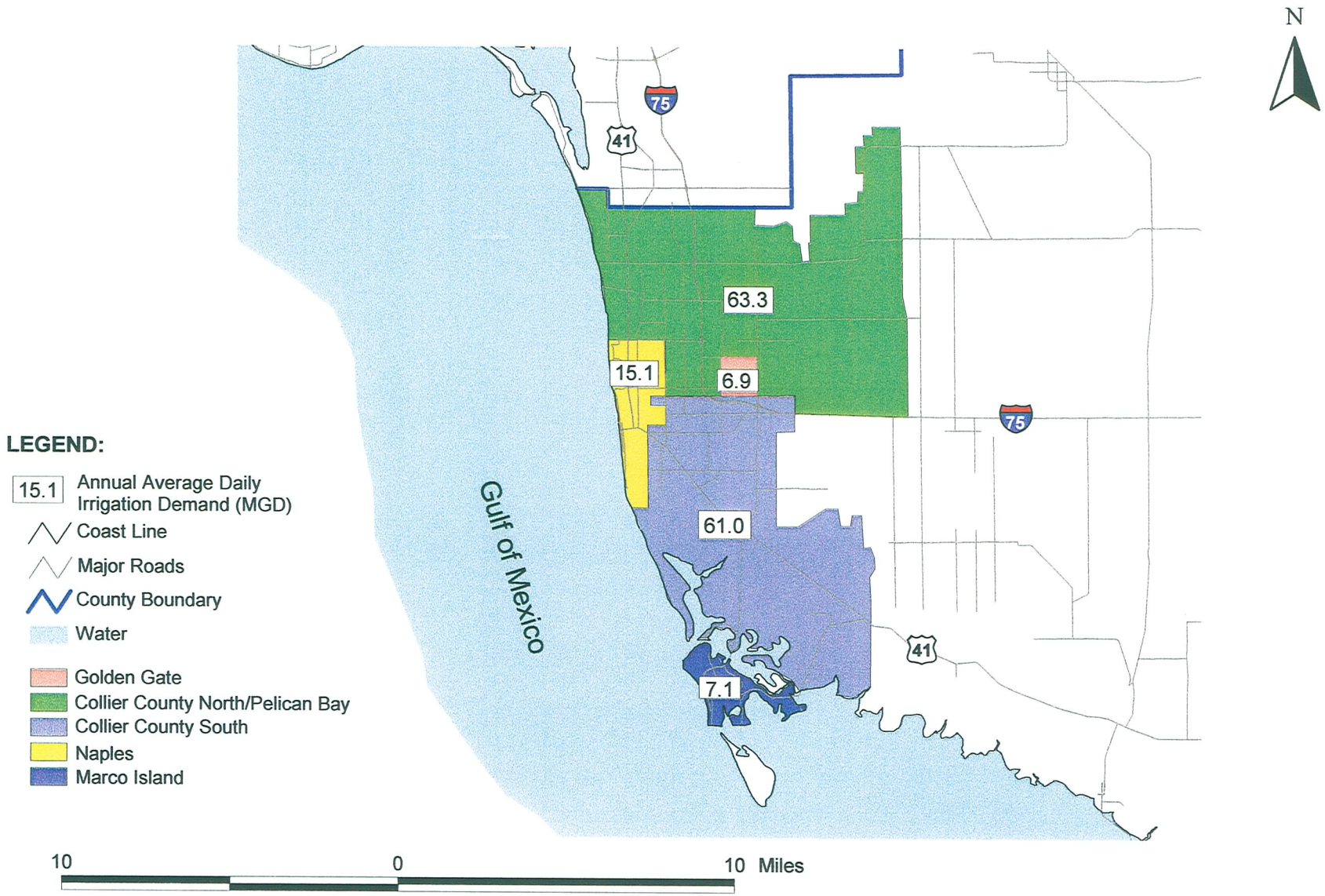
Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	CURRENT IRRIGATION DEMAND - LEE COUNTY	Figure No. 10



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	CURRENT IRRIGATION DEMAND - COLLIER COUNTY	Figure No. 11



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	FUTURE IRRIGATION DEMAND - LEE COUNTY	Figure No. 12



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	FUTURE IRRIGATON DEMAND - COLLIER COUNTY	Figure No. 13

Table 11 Demand Analysis - Current														
	Actual Reclaimed System Demand* (MGD)												Annual Average	Annual Total
Facility	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
Collier Co.														
Average 1-in-10 Irrigation (in)	1.3	1.5	3.8	4.8	5.2	4.7	4.6	4.1	3.1	3.4	2.7	1.9		
Collier Co. North[a]	7.7	8.0	8.5	7.2	6.0	5.5	5.8	5.7	5.3	6.7	6.9	7.4	6.7	2,454.6
Collier Co. South[a]	3.2	5.3	5.3	5.6	4.0	3.8	3.1	2.3	1.3	2.9	3.3	2.1	3.5	1,283.9
Golden Gate[b]	0.9	0.8	0.8	0.8	0.8	0.8	1.0	0.9	1.5	0.9	0.8	0.9	0.9	331.1
Marco Island Utilities[b]	1.2	1.5	1.5	1.8	1.5	1.2	0.4	0.7	0.3	1.1	1.5	1.3	1.2	426.2
Naples[b]	6.2	6.2	6.1	6.1	6.0	6.0	6.1	6.1	6.1	6.2	6.1	6.1	6.1	2,227.7
Subtotal	**19.2**	**21.9**	**22.2**	**21.6**	**18.3**	**17.3**	**16.3**	**15.6**	**14.5**	**17.8**	**18.6**	**17.8**	**18.4**	**6,723.5**
Lee Co.														
Average 1-in-10 Irrigation (in)	1.2	1.3	3.6	4.7	5.1	3.7	4.2	3.7	2.5	3.6	2.5	1.5		
Bonita Springs[b]	2.9	2.9	3.1	2.8	2.3	2.1	2.0	2.4	2.6	2.8	2.9	3.0	2.6	966.6
Cape Coral Utilities[c, b]	20.5	24.1	26.5	32.4	32.5	15.9	12.9	11.3	9.3	22.8	30.3	21.7	21.7	7,909.6
Fiesta Village[d]	1.0	1.3	1.1	1.2	1.2	0.6	0.4	0.4	0.2	0.9	1.3	1.0	0.9	321.5
Forest Utility[b]	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	90.9
Ft. Myers Beach[d]	2.1	1.9	3.6	3.6	2.8	2.1	2.0	2.0	1.2	2.6	2.8	2.1	2.4	874.8
Ft. Myers Central[e]	0.6	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.7	250.6
Ft. Myers South[e]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gateway[d]	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	107.2
Gulf Environmental Services[b]	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	276.2
Lehigh Acres[b]	0.9	0.8	0.8	0.8	0.6	0.8	1.1	1.7	2.4	2.0	1.2	1.2	1.2	438.4
North Ft. Myers[b]	0.8	0.8	0.6	1.1	0.9	0.7	0.6	0.3	0.5	0.8	0.8	0.8	0.7	262.5
Pine Island[g]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	36.5
Sanibel[h]	0.8	0.9	1.0	0.9	0.7	0.8	1.0	0.8	0.8	0.7	1.0	0.7	0.8	304.8
Waterway Estates[d]	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2
Subtotal	**31.0**	**34.8**	**38.9**	**44.9**	**43.1**	**25.1**	**22.1**	**21.1**	**18.9**	**34.8**	**42.4**	**32.6**	**32.5**	**11,848.8**
Total Monthly Flow (MGD)	**50.2**	**56.6**	**61.1**	**66.5**	**61.4**	**42.3**	**38.4**	**36.7**	**33.4**	**52.7**	**60.9**	**50.4**	**50.9**	**18,572.3**

*"Reclaimed System" is defined as all water that is conveyed in the reclaimed infrastructure, including surface water, reclaimed water, and groundwater withdrawals.

a. This data displays 1999 flows from Oct.- Dec. and 2000 flows for Jan. - Sept.

Table 11
Demand Analysis - Current

b. This data was taken from Monthly Operating Reports submitted to the Dept. of Environmental Protection (Jan - Sept '01, Oct - Dec '00)

c. Influent Cape Coral data combines the flow from Cape Coral Everest and Cape Coral Southwest WWTPs

d. 2000 data

e. This data displays 2000 data from Oct. - Dec. and 2001 flows for Jan. - Sept.

f. 2001 data (this plant just opened in Feb. of 2001)

g. 2001 data from Feb.- Sept. w/ supplemental data from Matlacha WWTP (now closed)

h. 1999 data

The Highpoint WWTP was deleted from The study due to its small flows and lack of data

Table 12
Demand Analysis – Future

Facility	Normalized Modified Blaney-Criddle Demand (MGD)												Annual Average	Annual Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
Collier Co.														
Average 1-in-10 Irrigation (in)	1.3	1.5	3.8	4.8	5.2	4.7	4.6	4.1	3.1	3.4	2.7	1.9		
Collier Co. North	72.4	75.3	80.0	67.7	56.4	51.7	54.6	53.6	49.9	63.0	64.9	69.6	63.26	23,091.2
Collier Co. South	69.8	72.6	77.1	65.3	54.4	49.9	52.6	51.7	48.1	60.8	62.6	67.1	60.99	22,261.9
Golden Gate	6.8	6.4	6.2	6.5	6.3	6.0	7.6	6.8	11.5	6.6	6.4	6.8	6.99	2,551.9
Marco Island Utilities	8.2	8.5	9.0	7.6	6.4	5.8	6.2	6.1	5.6	7.1	7.3	7.9	7.14	2,607.7
Naples	17.3	18.0	19.1	16.2	13.5	12.3	13.0	12.8	11.9	15.0	15.5	16.6	15.10	5,509.9
Subtotal	**174.5**	**180.7**	**191.4**	**163.3**	**137.0**	**125.8**	**133.9**	**131.0**	**126.9**	**152.6**	**156.7**	**168.0**	**153.5**	**56,022.6**
Lee Co.														
Average 1-in-10 Irrigation (in)	1.2	1.3	3.6	4.7	5.1	3.7	4.2	3.7	2.5	3.6	2.5	1.5		
Bonita Springs	23.2	23.5	25.2	23.0	18.6	17.4	16.1	19.8	20.7	23.1	23.2	24.2	21.50	7,846.9
Cape Coral Utilities	53.0	62.4	68.4	83.7	84.1	41.1	33.4	29.3	24.0	58.9	78.3	56.1	56.06	20,463.1
Fiesta Village	7.1	8.8	8.0	8.1	8.1	4.5	2.8	2.5	4.4	6.3	9.3	7.3	6.43	2,346.6
Forest Utility	1.0	1.0	1.0	0.9	0.8	0.8	0.8	0.7	0.8	0.9	0.9	1.0	0.88	322.9
Ft. Myers Beach	16.3	14.5	28.2	28.3	22.2	16.3	15.9	15.7	18.1	20.4	22.3	16.1	19.53	7,127.3
Ft. Myers Central	10.8	11.2	12.7	13.5	13.2	11.3	11.5	11.3	10.6	11.5	11.0	10.6	11.60	4,235.3
Ft. Myers South	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0
Gateway	4.2	4.0	4.3	4.0	4.2	4.3	4.2	5.0	4.9	4.9	5.0	4.7	4.47	1,631.8
Gulf Environmental Services	12.4	12.6	13.5	12.3	10.0	9.3	8.6	10.6	11.1	12.4	12.4	13.0	11.51	4,202.7
Lehigh Acres	27.8	24.7	47.9	48.1	37.8	27.8	27.1	26.8	30.7	34.6	38.0	27.4	33.23	12,128.1
North Ft. Myers	19.4	19.0	15.4	26.1	21.8	17.7	14.5	8.2	11.4	18.9	19.3	20.0	17.63	6,435.6
Pine Island	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.43	1,982.0
Sanibel	3.4	3.7	4.1	3.8	2.7	3.2	4.2	3.3	3.2	3.0	4.1	2.9	3.47	1,267.1
Waterway Estates	2.7	16.1	3.5	3.2	3.2	4.2	0.3	0.0	0.0	0.0	0.0	0.0	2.77	1,010.9
Subtotal	**186.9**	**206.9**	**237.6**	**260.4**	**232.1**	**163.2**	**144.9**	**138.8**	**145.4**	**200.2**	**229.3**	**188.6**	**194.5**	**71,000.2**
Total Monthly Flow (MGD)	**361.5**	**387.6**	**429.0**	**423.7**	**369.0**	**289.0**	**278.8**	**269.7**	**272.3**	**352.8**	**386.0**	**356.6**	**348.01**	**127,022.8**

* These figures represent calculated values for the year 2020, based on a normalized version of a modified Blaney-Criddle Method.

This analysis concludes that the demands were even more significant than previously predicted by the LWCWSP. In order to satisfy the growing demands placed on the current systems, it is clear that the future of irrigation water will draw from a variety of alternative sources to satisfy these projected demands and minimize impacts to other stretched resources, such as groundwater.

POTENTIAL URBAN IRRIGATION WATER SOURCES

The philosophy of the RIDS project is to optimize the current irrigation water sources and identify supplemental sources where necessary to meet future demands. In order to meet the demands developed in the previous section, alternative sources of supply must be utilized. Additional allocations from resources that are currently stretched, such as groundwater, will be minimized. Therefore, an inventory of potential sources of supply was conducted to address future irrigation water needs in the study area. These potential sources of supply are:

- Reclaimed wastewater from municipal wastewater treatment plants
- Water recovered during the dry season from reclaimed water aquifer storage and recovery (ASR) systems recharged during the wet season
- Surface water from streams, rivers, abandoned borrow pits, and canal systems having salinity control structures
- Water recovered during the dry season from surface water ASR systems recharged during the wet season
- Groundwater from irrigation supply wells

Reclaimed Water

In this study, it was assumed that all future wastewater flows would be available for use as reclaimed water. Currently, in many of the involved utilities, surplus water is discharged to surface water or is disposed of through deep well injection. The goal of the RIDS is to have 100% utilization of the effluent water in order to offset the irrigation demand during the dry season. All plant losses and plant water use were assumed to be negligible. Water reclamation facility expansions were taken into account.

The RIDS plans to utilize several reclaimed water interconnects, allowing water to be shared between utilities during times of surplus and deficit. No numbers are displayed to show quantities of water, because the interconnects will be designed to be able to flow in both directions, with actual quantities to be agreed upon by the utilities themselves.

Reclaimed Water ASR Systems

Reclaimed water ASR is seen to be an integral part of the RIDS. ASR has become increasingly more acceptable and permittable, both from a regulatory and a public awareness standpoint. This is especially true in areas where other supply sources are scarce or lacking. There are several reclaimed water ASR programs that are permitted and in some stage of startup and/or testing in southwest Florida. These include systems for Hillsborough County, City of Englewood, Manatee County, and Collier County. In each case, the recovered water is or will be used in a reuse irrigation system. This technology has also been used for many years as an irrigation source in California. Reclaimed water ASR is developing into one of the more viable options for optimizing existing irrigation water supplies and balancing storage needs.

To determine the amount of the projected irrigation shortfalls that could be met by reclaimed water ASR systems, it was assumed that the mean wet season surplus for each utility would be injected for a period of 120 days and later recovered at a 75% efficiency rate for a period of 180 days. The 75% efficiency factor reflects the loss of some of the injected water through diffusion and dispersion with

the native groundwater in the storage aquifer. In this study it was assumed that the Upper Floridan aquifer, which contains brackish native groundwater, would be used as the storage aquifer. The net result is that the dry season recovery rate would be approximately 50% of the wet season mean injection rate in MGD. The remaining dry season irrigation deficits must be met by other supplemental sources of supply.

A minimum distance of two miles from existing and permitted future municipal reverse osmosis (RO) supply wells and potable water ASR systems was set as a standard siting criteria for potential reclaimed water ASR systems. As some utilities have wastewater treatment plants located in close proximity to RO supply and potable water ASR wells, utilization of reclaimed water ASR would need to be on a semi-regional approach to maximize this resource. The regional approach will be described in some detail later in this document. Table 13 summarizes potential reclaimed water ASR capacities on a subregional basis.

Table 13
Summary of Potential Reclaimed Water ASR Capacity

Site	Projected 2020 Capacity (MGD)
Naples WWTP/ South Collier/ Marco Island Regional	7.5
North Collier/Pelican Bay/BSU Regional	4.0
GES/ Fiesta Village/Ft. Myers Beach Regional	5.0
Everest & Southwest/Waterway Estates/North Ft. Myers Regional	2.0
Ft. Myers Central/Ft. Myers South/ Gateway/ Lehigh Acres Regional	9.0

Surface Water

An inventory was conducted of 25 streams, rivers, and canals located in the study area (Table 14). Figures 14 through 17 display the surface water bodies and major control structures within the study area. Flow data for 22 of the surface water bodies is collected and recorded by either the United States Geological Survey (USGS) or the District. Surface water stage data is available for two of the remaining three surface water bodies. Twenty-two of the 25 surface water bodies inventoried have salinity control structures, which indicates that these water bodies could potentially be used as dry season sources of supply (if flow rates were deemed to be adequate). Available period of record flow data were tabulated and analyzed for each of the surface water bodies. Summaries of these tabulations and analyses are provided in Attachment E.

In a typical year, the four-month period of highest surface water flows occurs from July through October. This represents an approximate one-month delay from the four-month period of highest rainfall (i.e., June through September). Therefore, in the analyses of the surface water flow data for this study, the wet season is considered to be July through October, and the dry season is considered to be the six-month period of December through May. The months of November and June are considered transitional and were not integrated into the statistical analyses.

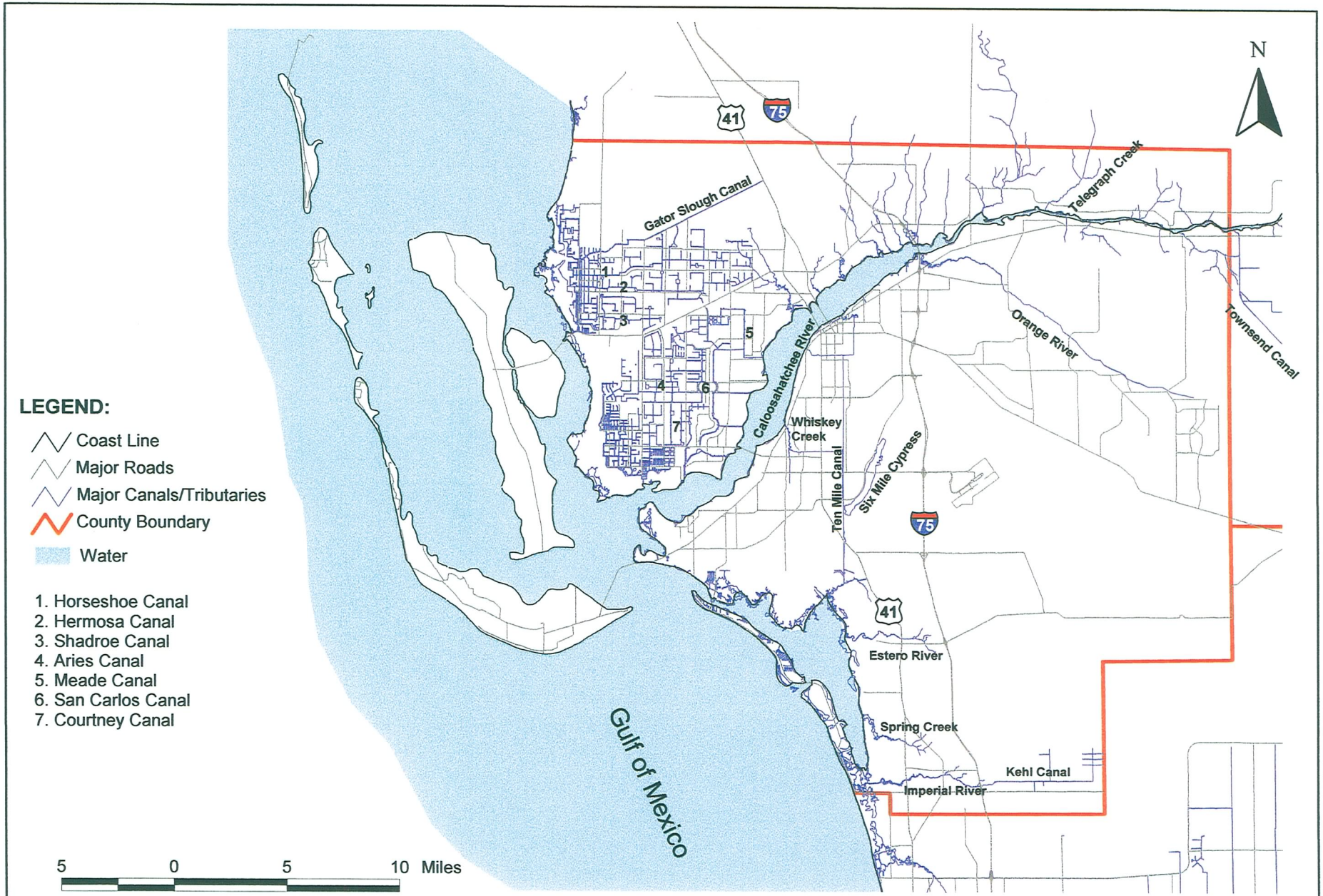
It should be noted that the City of Cape Coral currently utilizes its freshwater canal system as a dry season supplemental irrigation source of supply. This includes Gator Slough and the Aries, Hermosa, Courtney, Horseshoe, Meade, and San Carlos Canals.

Table 14
Summary of USGS and SFWMD Stream Flow Data[1]

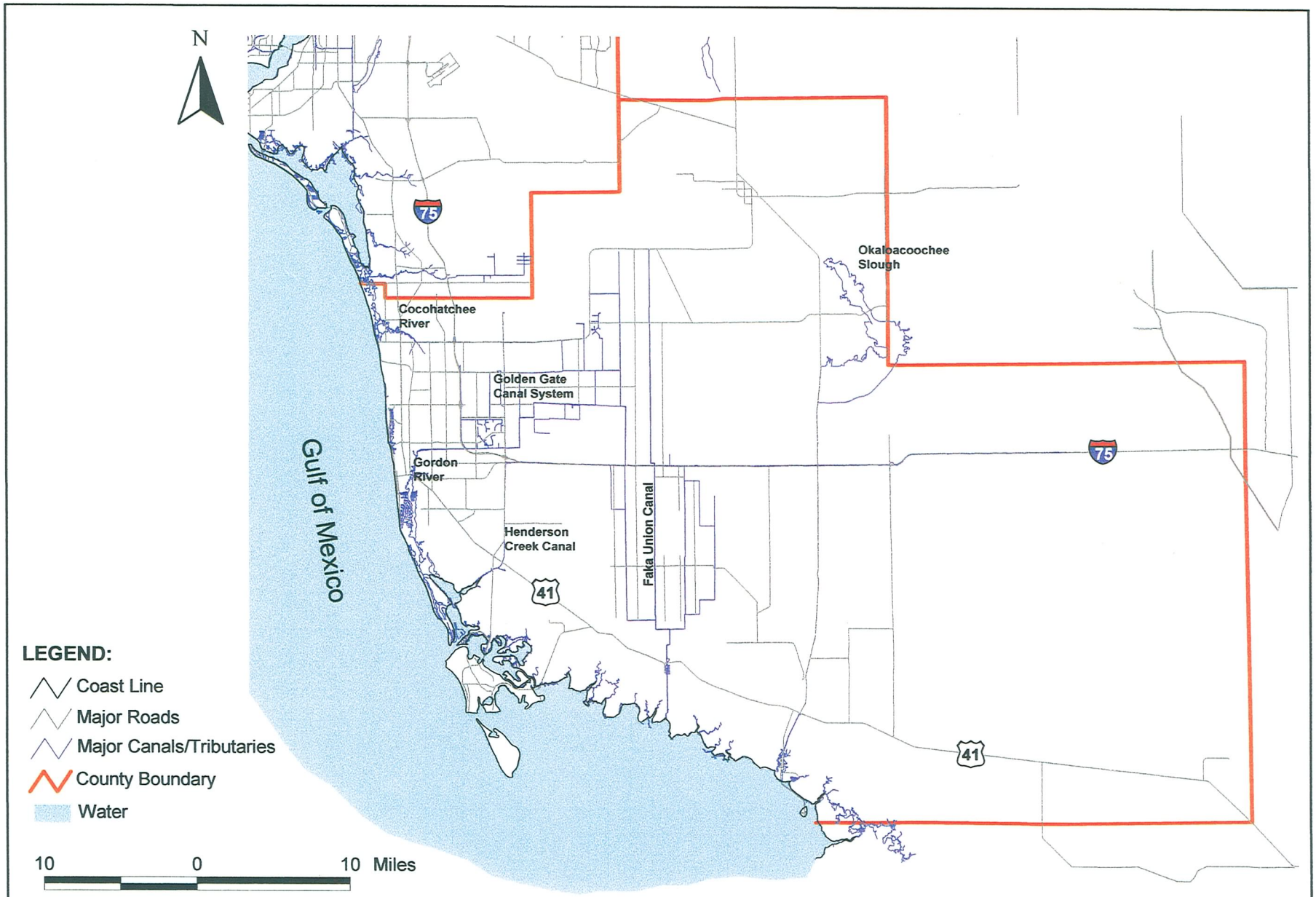
Water Body	Gauge Location	Period of Record	Mean Wet Season Flow (MGD)	Mean Dry Season Flow (MGD)	1-in-10 Year Dry Season Flow (MGD)	Utility Service Area	Comments
Caloosahatchee River	S-79	1954-2000	1550	769	20	Lee County Utilities	1971-96
Golden Gate Canal System	17th Ave SW	1965-84	208	60	4	Collier County Utilities	1983
Golden Gate Canal System	Airport Rd.	1964-84	394	82	2	Collier County Utilities	1983
Faka Union Slough	0.5 miles north US 41	1978-99	342	64	0	Collier County Utilities	1983
Telegraph Creek*	Telegraph Creek Lane	1997	163	1	0	Lee County Utilities	WRS, 1998
Cocohatchee River	Willoughby Acres Bridge	1969-99	45	7	1	Collier County Utilities	1983
Imperial River*	Orr Road	1941-54, 1988-2000	146	17	7	Bonita Springs Utilities	
Henderson Creek Canal	Near US 41	1968-99	29	5	0	Florida Water Ser./CCU	
Townsend Canal	SR 80	1975-96	46	-33	-40	Florida Water Services	1983/87
Ten Mile Canal	1.05 miles north of Alico Rd	1990-98	119	12	3	LCU/ City of FM	
Gator Slough	Near SR 765	1984-2000	67	8	0	City of Cape Coral	
Aries Canal	SW 28th St	1989-2000	20	3	1	City of Cape Coral	
Hermosa Canal	Near SR 765	1987-2000	26	5	0	City of Cape Coral	
Estero River*	1 mile east of US 41	1989-2000	18	2		Gulf Envir. Services	
Courtney Canal	Mohawk Pkwy	1986-2000	11	3	0	City of Cape Coral	
Horseshoe Canal	Near SR 765	1987-2000	31	6	0	City of Cape Coral	
Six Mile Cypress	Near Ten Mile Canal	1992-2000	38	2	0	LCU/ City of Ft. Myers	
Shadroe Canal	Embers Pkwy	1987-2000	13	3	1	City of Cape Coral	

Water Body	Gauge Location	Period of Record	Mean Wet Season Flow (MGD)	Mean Dry Season Flow (MGD)	1-in-10 Year Dry Season Flow (MGD)	Utility Service Area	Comments
Whiskey Creek	Whisky Creek Drive	1995-2000	14	3	1	City of Ft. Myers	
Spring Creek*	Old US 41	1989-2000	12	2	0	Bonita Springs Utilities	
Meade Canal	Viscaya Pkwy	1986-2000	6	1	0	City of Cape Coral	
San Carlos Canal	SE 26th Terrace	1986-2000	6	1	0	City of Cape Coral	
Gordon River	SR 886	1972-84, 1991-99	1	1	0	City of Naples	
Orange River	Buckingham Road	1984-99				Florida Water Services	Stage data only
Okaloacoochee Slough	Near Sunniland	1979-80				Collier County Utilities	Stage data only
Kiehl Canal		NA				Bonita Springs Utilities	

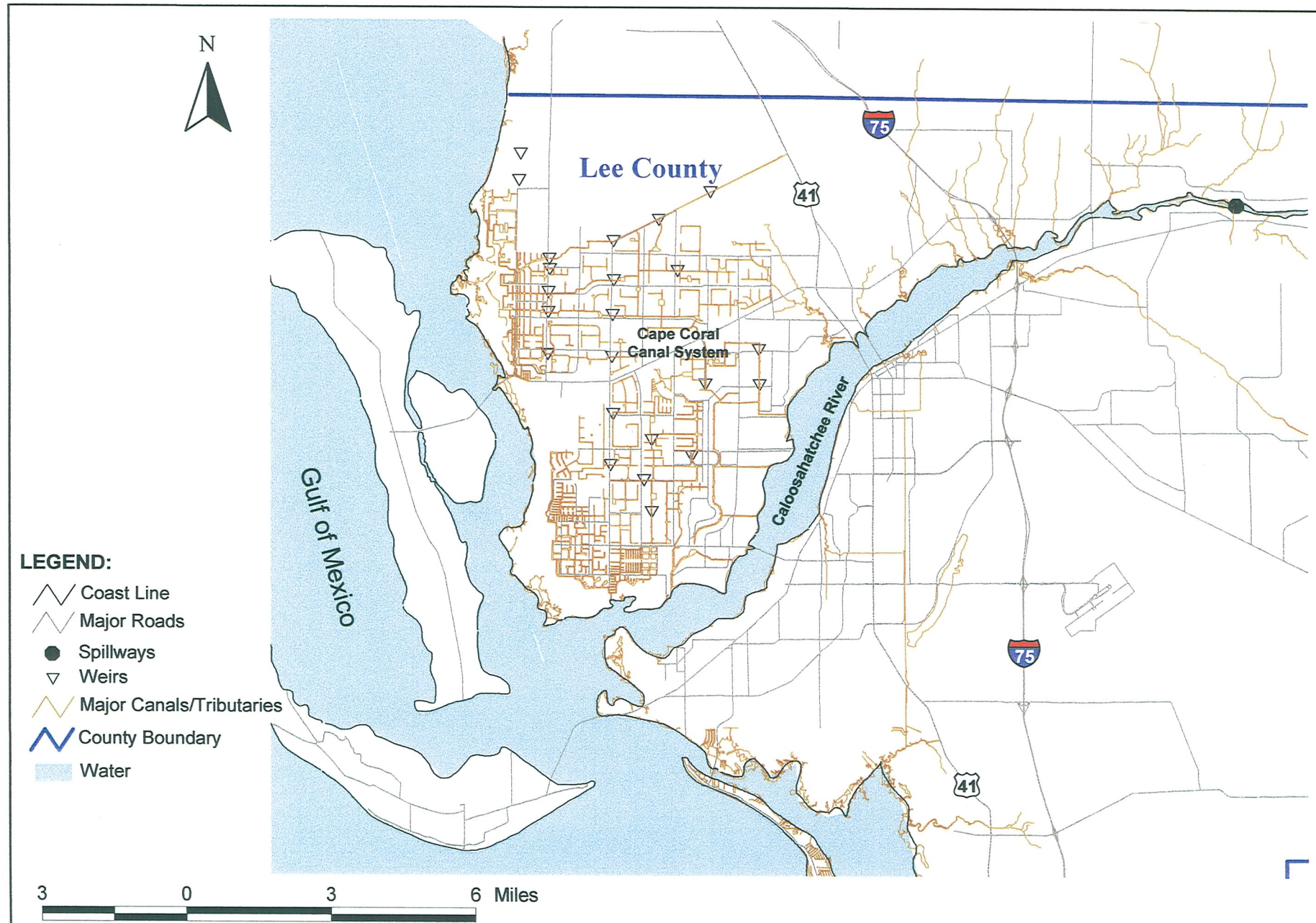
[1] Water Year 2000 data unless otherwise specified.
* = No salinity control structure.



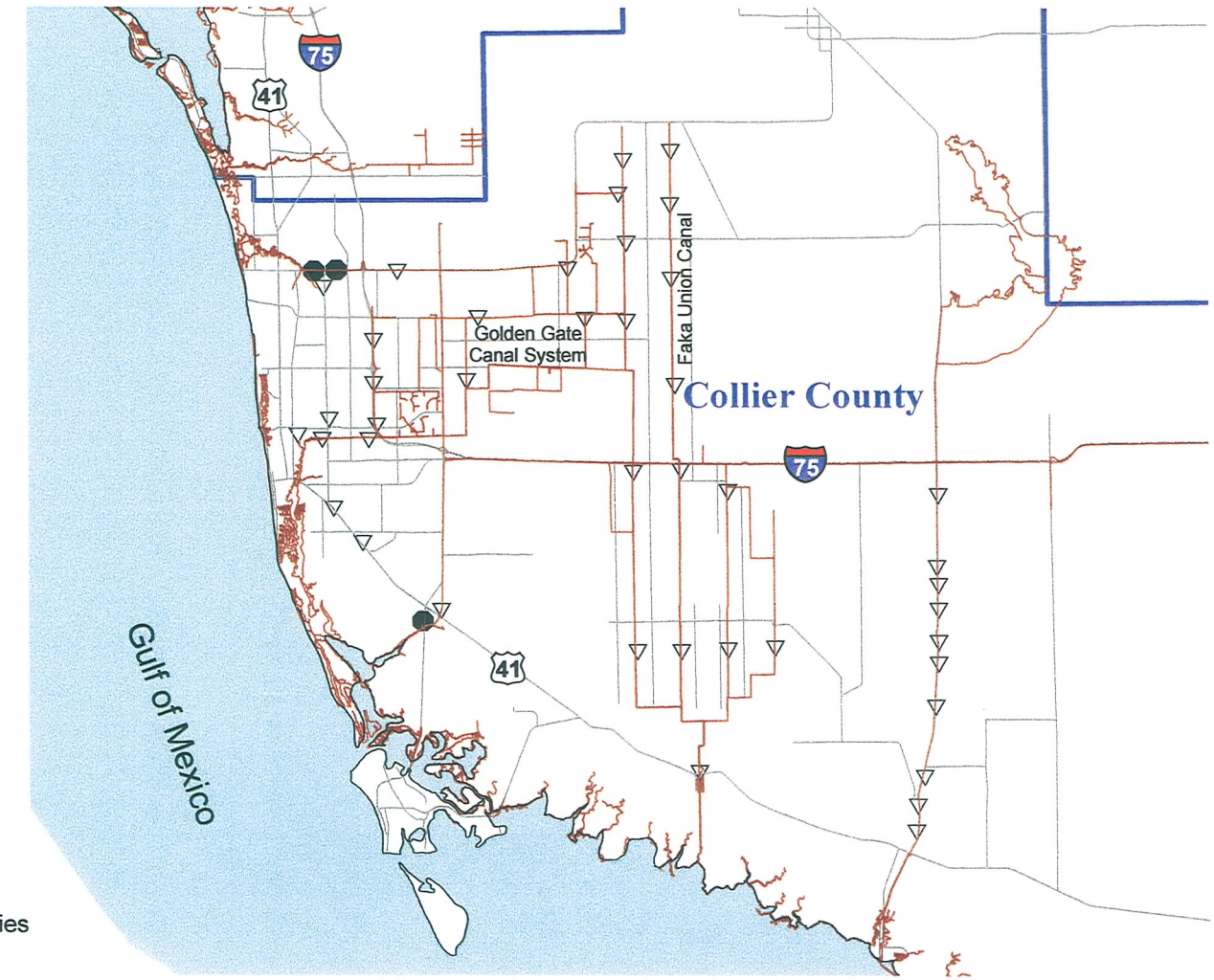
Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE		South Florida Water Management District	MAJOR WATER BODIES - LEE COUNTY	Figure No. 14



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	**MAJOR WATER BODIES - COLLIER COUNTY**	Figure No. 15



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	SURFACE WATER RESOURCES STRUCTURES - LEE COUNTY	Figure No. 16



LEGEND:

- Coast Line
- Major Roads
- Spillways
- Weirs
- Major Canals/Tributaries
- County Boundary
- Water

10 0 10 Miles

Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE		South Florida Water Management District	SURFACE WATER RESOURCES STRUCTURES - COLLIER COUNTY	Figure No. 17

The current permitted withdrawal rate from this source is approximately 28 MGD. Ongoing improvements to the control structures for this system will provide an incremental future increase in permitted withdrawal capacity. Measured dry season flow rates in the canal system have been influenced by these withdrawals since the City's reuse system became operational in 1994.

In order to evaluate the potential use of other surface water systems, a mean dry season flow rate of at least 20 MGD was set as a limiting factor. This would provide for 2 MGD if a 10% diversion rate for irrigation purposes could be permitted. The remaining 90% of flow would continue to support environmental needs. Based on these evaluation criteria, only two surface water bodies have the potential for use as dry season sources of supply. These are the Golden Gate Canal system and the Faka Union Canal system. Furthermore, drought condition flow evaluations indicate that the Golden Gate and Faka Union Canal systems would not be reliable sources during 1-in-10 year drought events. While the Caloosahatchee was originally looked upon favorably as an irrigation water source, the District has indicated that surface water from the Caloosahatchee River shall not be considered as a potential dry season supplemental water source for the RIDS because of the CERP and ongoing shortages.

Surface Water ASR Systems

In order to provide drought condition reliability for surface water sources of supply and also to provide a more efficient use of surface water bodies that have mean dry season flows of less than 20 MGD, surface water ASR systems are another essential part of the RIDS project. The concept of using surface water as a source to recharge an ASR system and then withdrawing that stored water for use in irrigation systems is increasingly gaining acceptance.

The main criterion for narrowing the analysis was a mean wet season flow of 20 MGD or greater, utilizing a diversion rate of 20% to a surface water ASR system. It was determined that 8 of the 25 surface water bodies would be available for use in a surface water ASR system without a detrimental effect on the environment. These are identified in Table 15. The storage aquifer for the potential surface water ASR systems was assumed to be the Upper Floridan aquifer.

Surface water ASR is currently being used at the Marco Lakes site, which Florida Water Services uses as a potable water supply source for Marco Island in Collier County. That system diverts a small percentage of the wet season flow from Henderson Creek to ASR wells via the Lakes. A surface water ASR system is also currently under development for the City of North Port. This system will divert a small percentage of the wet season flow from the Myakkahatchee Creek for subsurface storage, and later withdrawal, for potable purposes after treatment.

As surface water ASR is currently used in southwest Florida as a potable source, it follows that recovered water use for irrigation would be suitable and will not be constrained by such stringent water quality criteria. It should be noted that surface water ASR is the main component contemplated to meet water supply demands for the CERP.

Prior to injection of surface water into an ASR system, it is anticipated that filtration and disinfection will be needed in order meet applicable water quality standards. The cost for these types of treatment systems is included in the estimated costs for the surface water ASR systems. Water quality exemptions (minor) for certain secondary parameters (e.g., color) may be required for some sources.

It is anticipated that the recovered water from these surface water ASR systems will meet the regulatory criteria of FAC 62-610.472.

Telegraph Creek was not included due to the fact that only one year of partial flow data is available for that stream. The storage aquifer for the potential surface water ASR systems was again (as in the case of reclaimed water ASR systems) assumed to be the Upper Floridan aquifer.

A minimum distance of two miles from existing and permitted future municipal reverse osmosis (RO) supply wells and potable water ASR systems was used in the site selection process. In most cases the location selected for a surface water ASR system was adjacent to a control structure.

Table 15
Summary of Potential Surface Water ASR Systems

Irrigation Supply Source	Pumping Station Location	Dry Season ASR Recovery (MGD)[2]	Average Dry Season Surface Water Flow (MGD)[3]	Utility Service Area
Caloosahatchee River	S-79	155[1]	77[1]	Lee County Utilities (LCU)
Golden Gate Canal System	17th Ave SW	21	6	Collier County Utilities (CCU)
Golden Gate Canal System	Airport Rd.	39	8	CCU
Faka Union Slough	0.5 miles north US 41	34	6	CCU
Cocohatchee River	Willoughby Acres Bridge	5	1	CCU
Imperial River*	Orr Road	15	1	Bonita Springs Utilities
Henderson Creek Canal	Near US 41	3[1]	2[1]	Florida Water Ser./CCU
Ten Mile Canal	1.05 mi north of Alico Rd	12	-	LCU/ City of Ft. Myers
Gator Slough	Near SR 765	7	0.8[1]	City of Cape Coral (CC)
Hermosa Canal	Near SR 765	3	0.3[1]	CC
Horseshoe Canal	Near SR 765	3	0.3[1]	CC

[1] Source currently being used for municipal potable or reuse system.
[2] Based on 20% diversion of wet season surface water flow to ASR system for 120 days and 75% recovery efficiency for 180 days.
[3] Based on 10% diversion of dry season surface water flow.
* = No salinity control structure.

Existing Potable Water Supply Facilities

The locations of existing potable water infrastructure including treatment plants, wellfields, surface water intakes and potable water ASR wells were determined. Figures 18 and 19 present the existing potable water infrastructure facilities for Lee and Collier counties, respectively.

Groundwater

Groundwater is currently used as a supplemental irrigation source for reuse water by both the City of Cape Coral and by Collier County Utilities. The City of Cape Coral utilizes horizontal wells constructed in the water-table aquifer to supplement its reuse and freshwater canal sources. Collier County utilizes Lower Tamiami aquifer wells at its Pelican Bay wellfield and is currently designing water-table aquifer wells at Mule Pen Quarry to supplement its reuse system. The

potential future use of water-table aquifer horizontal well systems located in road rights-of-way is a feasible alternative.

In the future, potential may exist for utilizing surficial aquifer horizontal wells as a supplemental RIDS source in selected locations. Also, horizontal wells constructed at select golf courses and other locations could be utilized as an injection water source for Floridan aquifer ASR wells. This would serve to more efficiently utilize a resource that would otherwise be pumped from wet areas and stormwater systems, and ultimately be discharged to tidal water bodies during the wet season. While this may be a feasible option at a later time, further evaluation of horizontal wells is not included as part of this study. It is important to note that the District will likely discourage the future use of vertical wells withdrawing from freshwater aquifers to provide supplemental water for irrigation purposes.

It may be possible, however to obtain supplemental water for reclaimed systems through adjacent wells from other mine pits that have ceased active mining operations. Four additional mining operations have been identified in the study area, and have been determined to be in excellent locations for withdrawal.

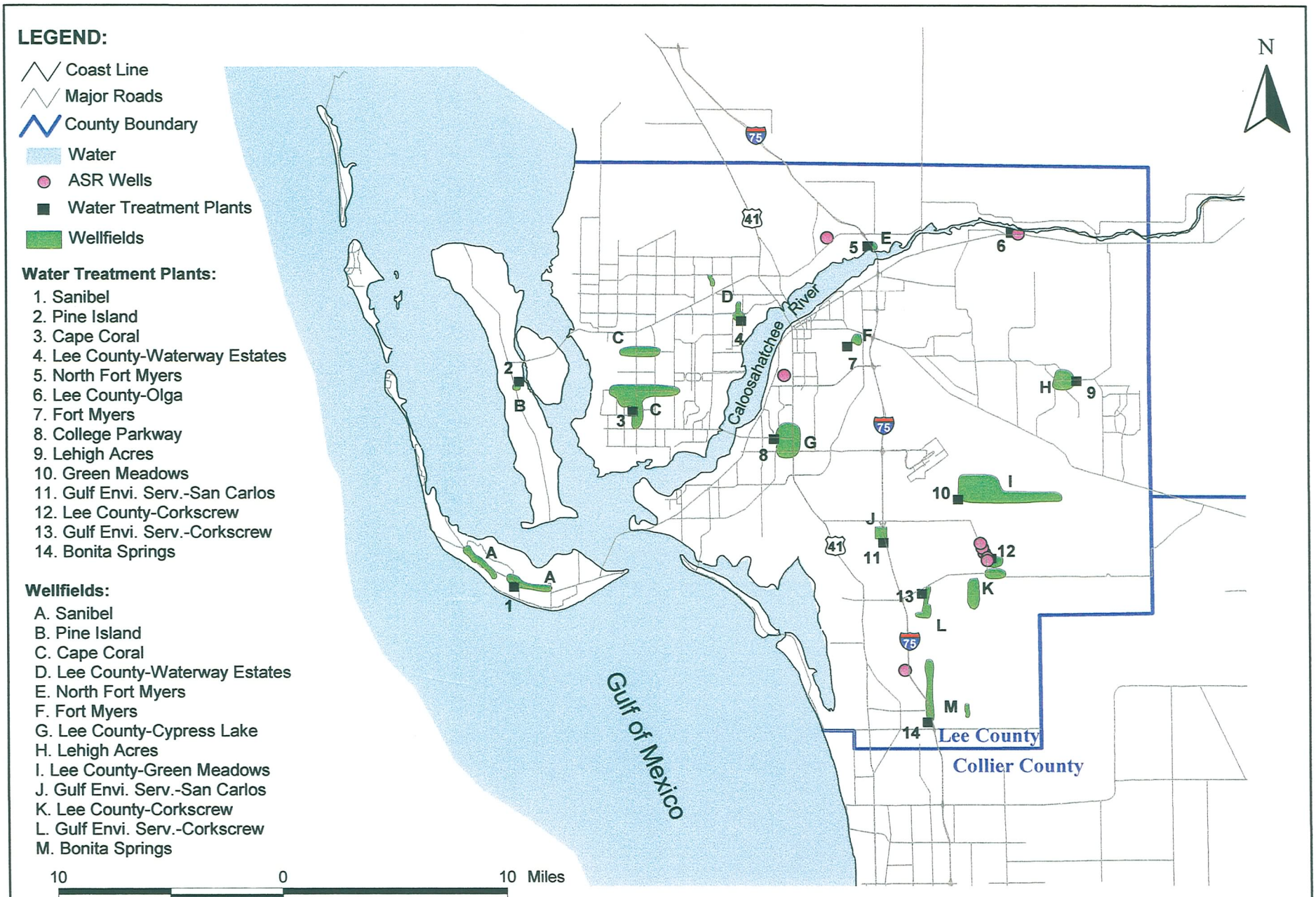
These are summarized on Table 16, and the locations of these operations are shown on Figures 20 and 21.

In the usual course of development, after mine pits have been fully utilized to extract aggregates, they are commonly integrated in planned residential/golf course developments as aesthetic amenities. Examples of this are Miromar Lakes in Lee County and Heritage Bay in Collier County. The existing lakes also commonly serve as irrigation water sources for the new developments. With this in mind, as well as the fact that the water use permit allocations for the active mines are mostly for recirculated water and not for water that is actually lost from a site, the estimated volume of water that could be used to supplement the RIDS was estimated at 25% of the current mine permit allocation.

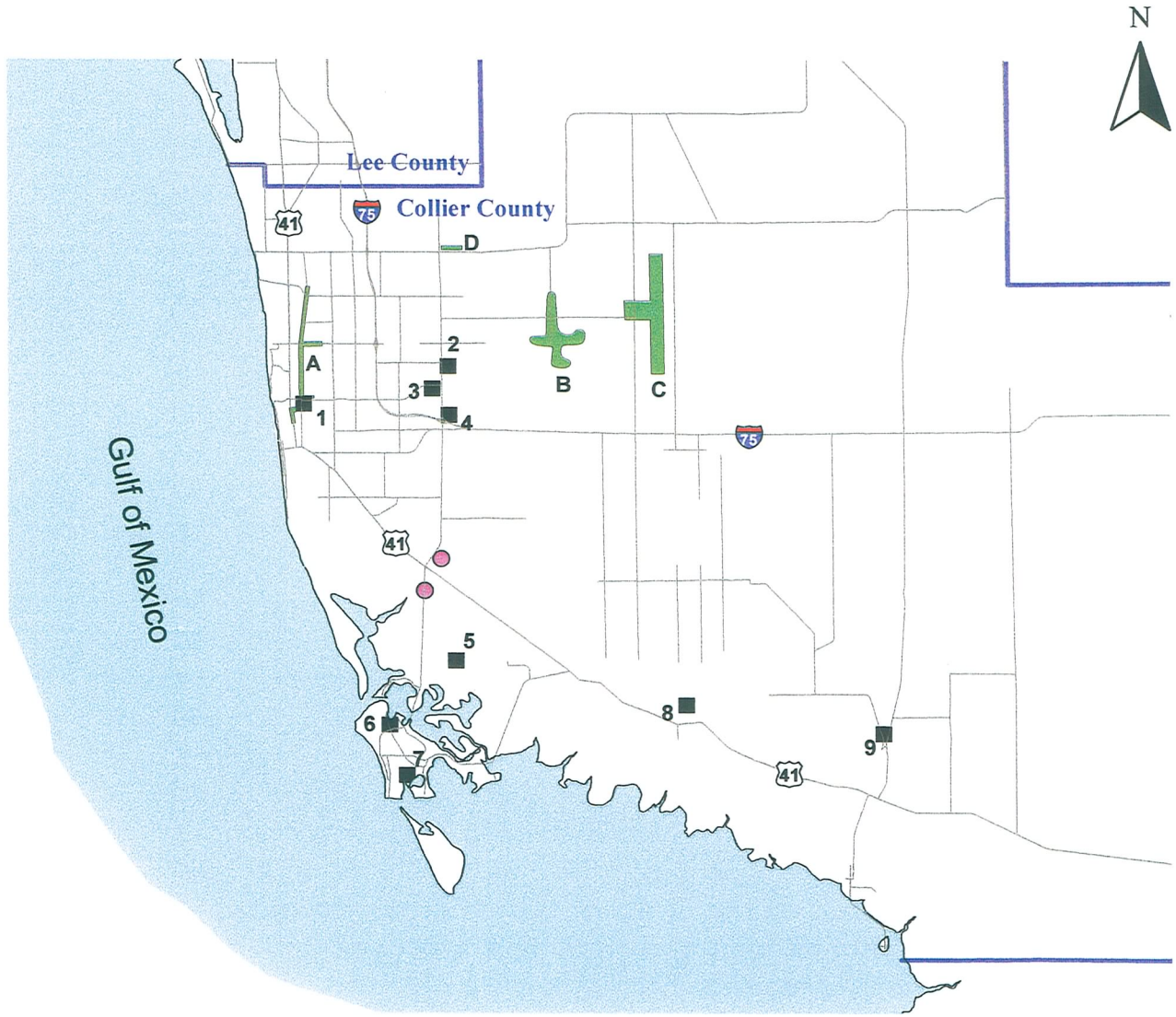
Table 16
Summary of Mine Pits That May Have Future Potential as Supplemental Water Supplies

Permit #	Permittee	Location	Mine Name	Current Allocation (MGD)	Estimated Useable Future Withdrawal (MGD)
08-00008-W	Coral Rock Ind.	Sec. 26-42S-25E	Limerock	3.24	0.8
08-00011-W	Ajax Paving	Sec. 23,24-42S-25E	Jay Rock	3.24	0.8
08-00045-W	Babcock Florida	Sec. 25-42S-25E	Babcock	7.2	1.8
11-00039-W	Florida Rock	Sec. 13-48S-26E	Mule Pen	5.04	0.0[1]
11-00256-W	Ashland Oil	Sec. 16-49S-27E	Golden Gate	6	1.5
			Totals:	**56.75**	**12.9**

[1] This source is already permitted to provide supplemental water for Collier County's reuse system.



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	EXISTING WATER SUPPLY, WELLFIELD AND ASR LOCATIONS IN LEE COUNTY	Figure No. 18



LEGEND:

- Coast Line
- Major Roads
- County Boundary
- Water
- ASR Wells
- Water Treatment Plants
- Wellfields

Water Treatment Plants:

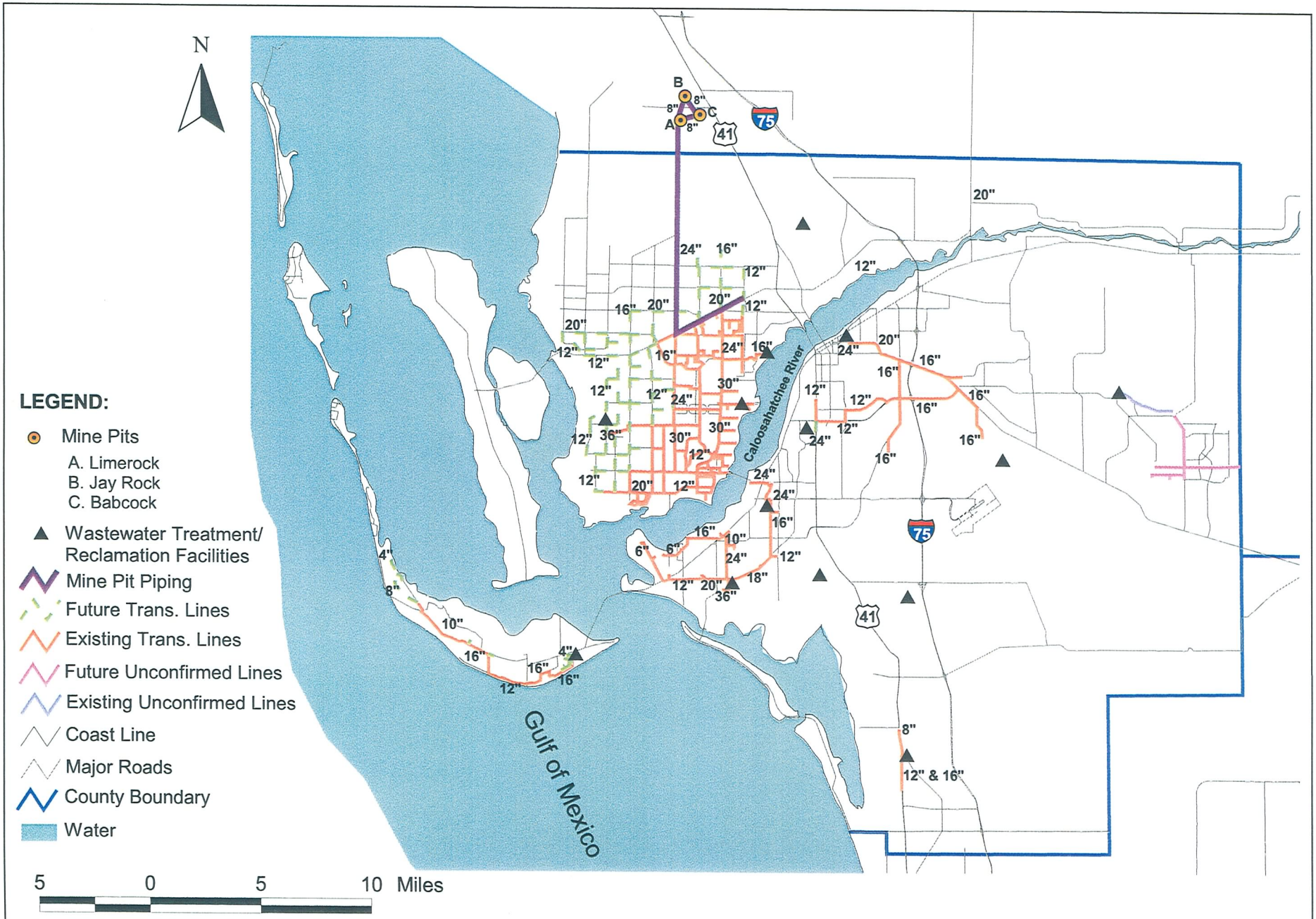
1. Naples
2. Collier County North
3. Golden Gate
4. Collier County South
5. Marco Shores
6. Marco Island LSP
7. Marco Island ROP
8. Port of the Isles
9. Everglades City

Wellfields:

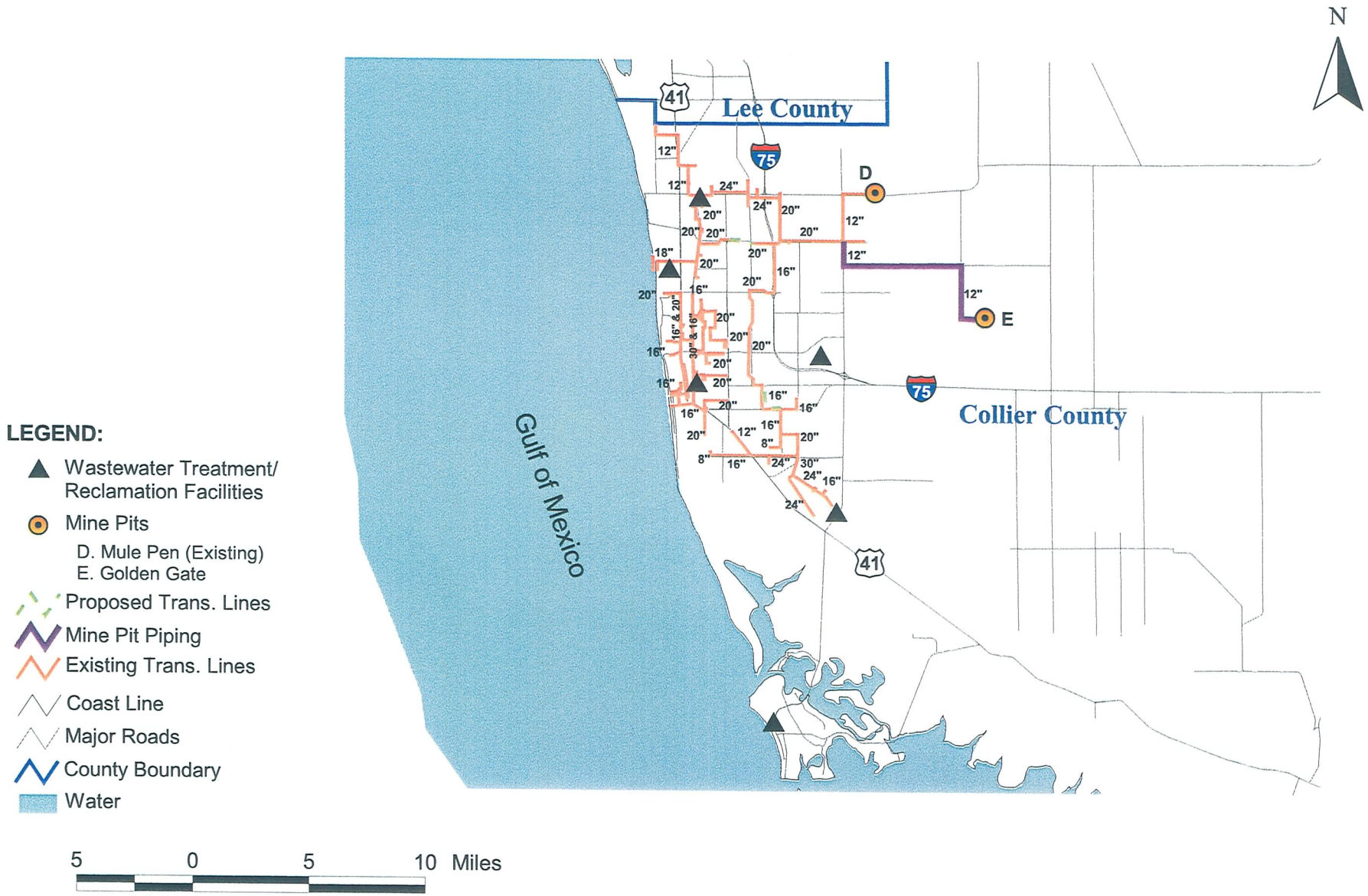
A. Naples Coastal Ridge
B. Collier East Golden Gate
C. Naples East Golden Gate
D. Immokalee

10 0 10 Miles

Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	EXISTING WATER SUPPLY, WELLFIELD AND ASR LOCATIONS IN COLLIER COUNTY	Figure No. 19



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	MINE PIT LOCATIONS AND PIPING - LEE COUNTY	Figure 20



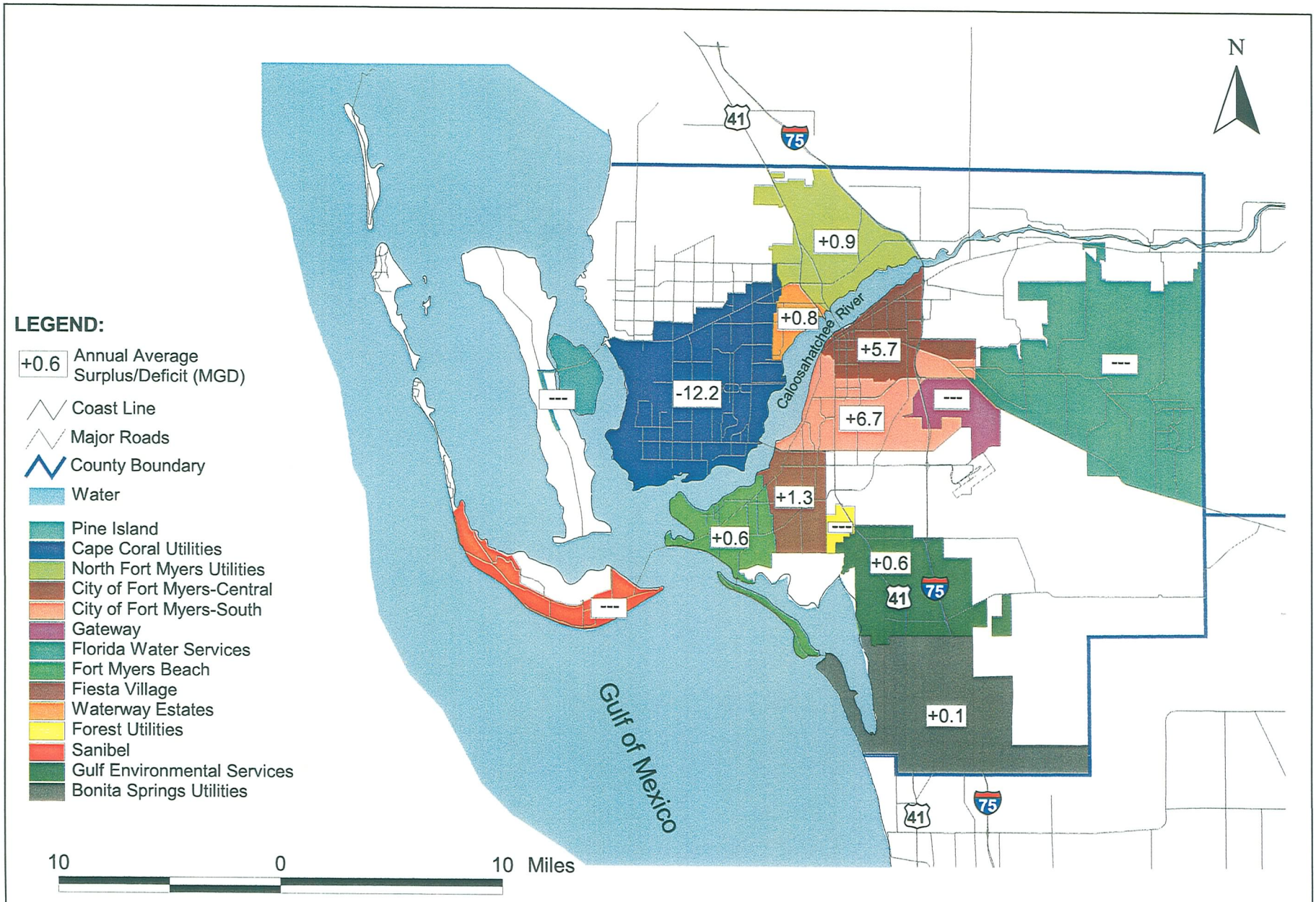
Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	MINE PIT LOCATIONS AND PIPING - COLLIER COUNTY	Figure 21

SUPPLY AND DEMAND ANALYSIS

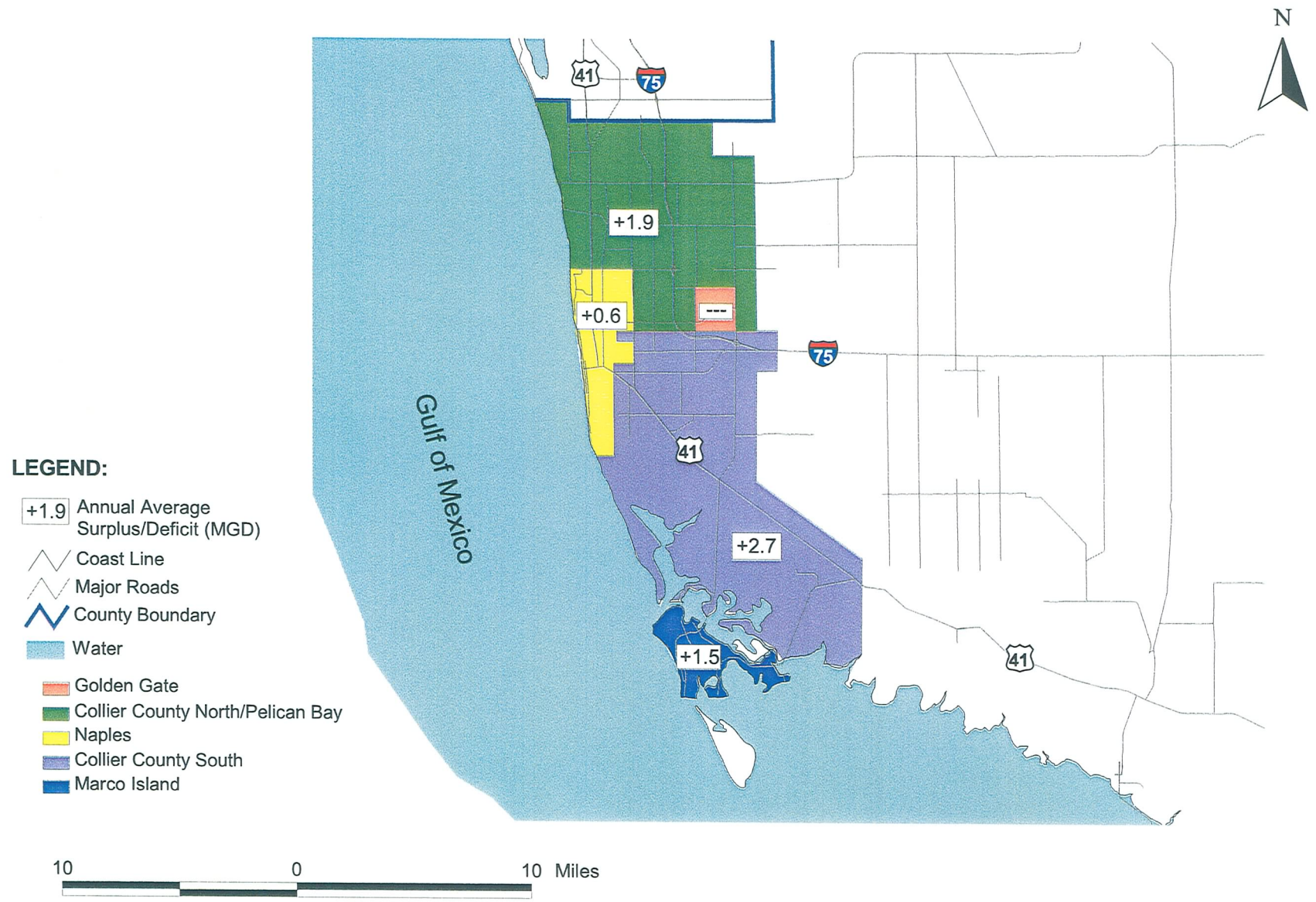
In order to quantify the alternative water sources that would be necessary, a comparison of future urban irrigation supply and demand was performed. Irrigation water surpluses and deficits were identified both geographically and temporally in the defined study area, and used to help identify the most effective alternatives in the next phase of the project. Tables 17 and 18 present the surplus/deficit summary for each service area. Also, a summary of the existing agricultural users within the study area is provided as Attachment F. Nearly 600 MGD is currently utilized for agricultural irrigation during the dry season in the study area. Most of this water is currently derived from surficial and intermediate aquifer wells. Figures 22 through 25 display the surplus and deficit information derived from this analysis.

Figure 26 illustrates the supply/demand analysis for the entire RIDS service area. Supplies including surface water ASR, surface water withdrawals, reclaimed water, and reclaimed water display the cumulative benefit of all alternative options. The lines demonstrate the demand that was seen in year 2000, the year 2000 demand plus the anticipated major irrigation users to request reclaimed water in the next 20 years, and the projected 2020 irrigation demand.

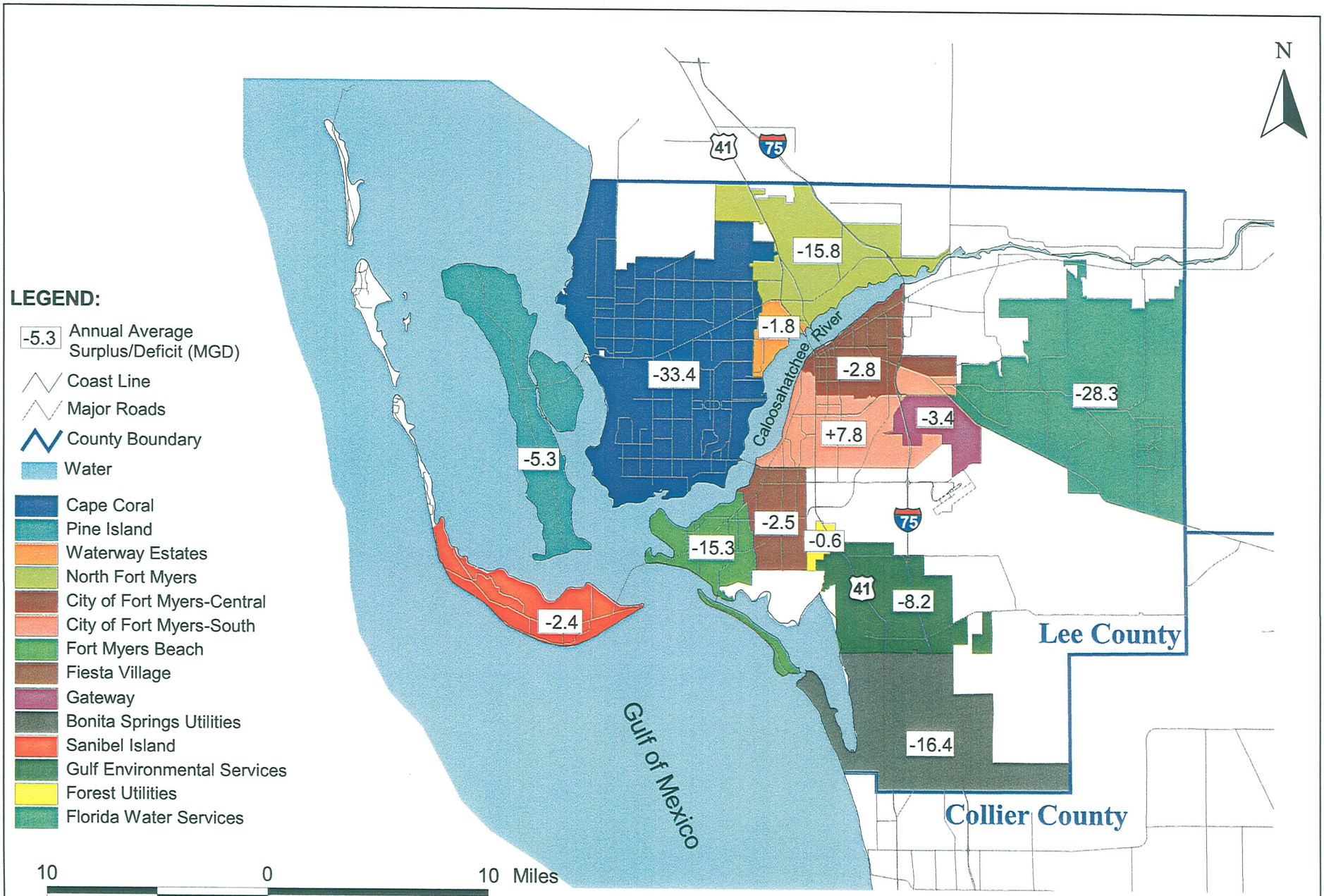
It is clear that by the year 2020, the projected irrigation water demands will far outweigh the supply if no alternative sources of water are integrated into the existing systems.



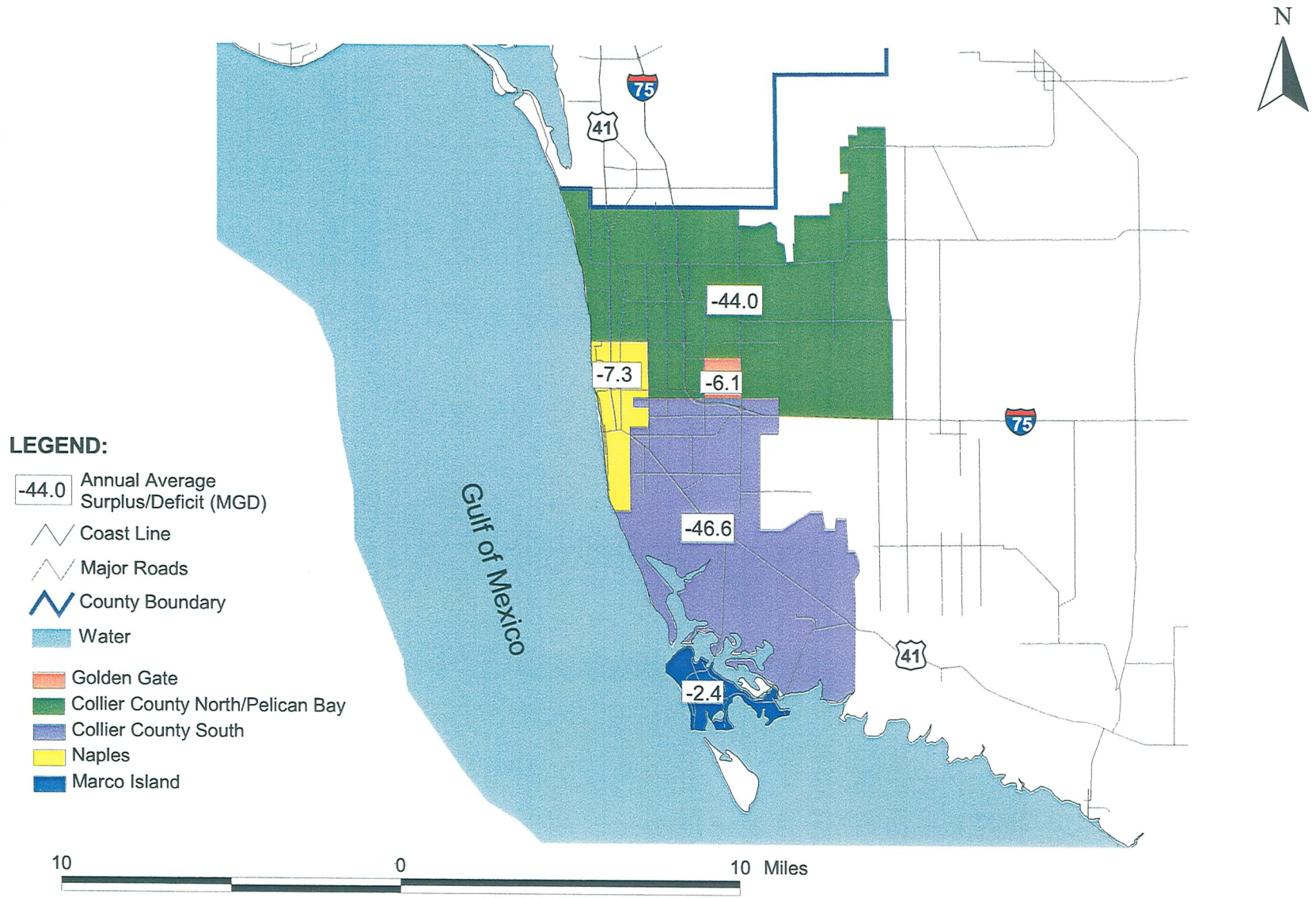
Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	CURRENT SURPLUS/DEFICIT - LEE COUNTY	Figure No. 22



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	CURRENT SURPLUS/DEFICIT - COLLIER COUNTY	Figure No. 23



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	FUTURE SURPLUS/DEFICIT - LEE COUNTY	Figure No. 24



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	FUTURE SURPLUS/DEFICIT - COLLIER COUNTY	Figure No. 25

Figure 26 -- Supply/Demand Analysis

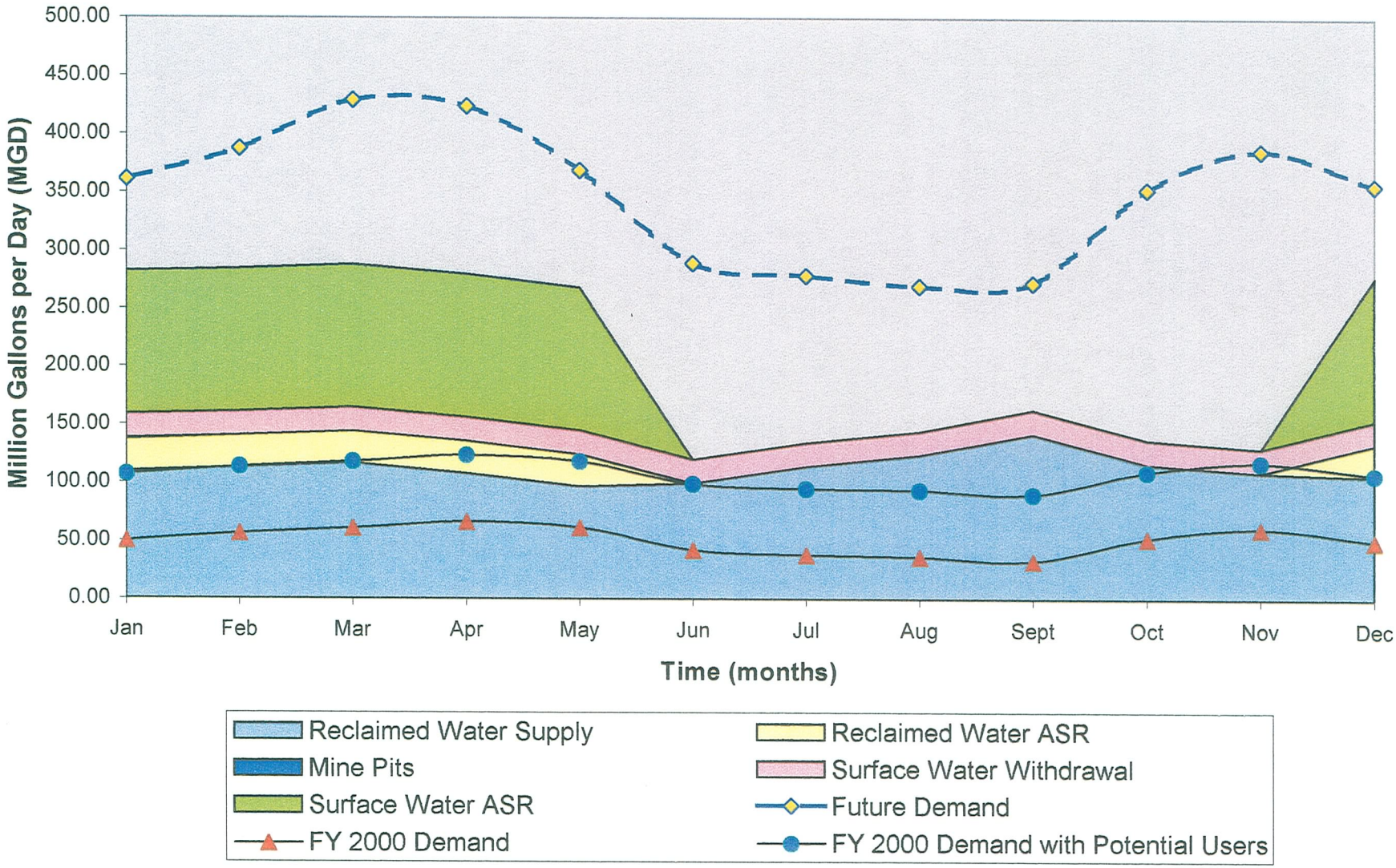


Table 17
Surplus/Deficit Analysis – Current

Facility	Monthly Surplus/Deficit (MGD)												Annual Average (MGD)	Annual Total (MGY)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec		
Collier Co.														
Collier Co. North	1.9	2.0	1.9	1.9	1.7	1.6	1.1	2.1	3.3	1.7	2.2	1.5	1.9	696.2
Collier Co. South	3.6	1.7	1.6	0.8	1.5	1.6	2.5	3.9	6.2	3.5	3.3	4.1	2.9	1,045.6
Golden Gate	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marco Island Utilities	1.3	1.6	1.9	0.8	1.4	1.9	2.5	2.5	1.6	1.0	0.6	0.7	1.5	548.0
Naples	0.5	0.7	1.1	0.7	(0.4)	(0.2)	1.7	1.0	0.7	0.5	0.7	0.6	0.6	230.6
Subtotal	**7.2**	**6.0**	**6.5**	**4.2**	**4.1**	**4.9**	**8.0**	**9.5**	**11.8**	**6.7**	**6.8**	**7.0**	**6.9**	**2,520.4**
Lee Co.														
Bonita Springs	0.0	0.0	-	(0.0)	-	-	0.5	(0.0)	0.5	(0.0)	0.0	0.0	0.1	31.0
Cape Coral Utilities	(11.4)	(15.4)	(17.4)	(23.6)	(24.0)	(6.2)	(2.3)	(0.7)	2.3	(13.2)	(21.3)	(13.1)	(12.2)	(4,453.3)
Fiesta Village	1.2	1.2	1.2	1.0	0.7	1.2	1.8	1.9	2.7	1.4	0.8	1.0	1.3	487.4
Forest Utility	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ft. Myers Beach	1.2	2.0	0.2	(0.4)	(0.5)	0.4	0.6	0.7	2.0	0.1	0.3	0.9	0.6	225.0
Ft. Myers Central	3.8	4.2	4.4	4.4	4.2	4.8	6.9	8.3	11.7	6.4	4.6	4.2	5.7	2,063.5
Ft. Myers South	5.5	5.5	5.8	5.7	4.9	5.4	7.8	9.6	11.5	7.0	5.8	5.5	6.7	2,437.3
Gateway	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gulf Environmental Services	0.7	0.8	0.8	0.7	0.5	0.4	0.5	0.6	0.8	0.3	0.5	0.5	0.6	216.0
Lehigh Acres	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Ft. Myers	0.6	0.6	0.7	0.3	1.7	0.4	1.4	1.6	1.5	1.0	0.5	0.5	0.9	330.6
Pine Island	-	(0.1)	0.0	0.0	(0.0)	0.0	0.1	0.0	0.0	(0.0)	(0.0)	0.0	0.0	1.0
Sanibel	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	(0.2)	0.1	0.0	14.5
Waterway Estates	0.8	0.6	0.7	0.7	0.7	0.7	0.9	1.1	1.2	1.0	0.8	0.8	0.8	309.4
Subtotal	**2.5**	**(0.7)**	**(3.5)**	**(11.1)**	**(11.8)**	**7.3**	**18.2**	**23.2**	**34.2**	**4.1**	**(8.2)**	**0.3**	**4.6**	**1,662.3**
Total Monthly Flow (MGD)	**9.7**	**5.3**	**3.0**	**(6.8)**	**(7.7)**	**12.2**	**26.2**	**32.7**	**46.1**	**10.8**	**(1.4)**	**7.3**	**11.5**	**4,182.7**

*These figures represent calculated values based on the supply and demand displayed in Tables 13 and 14.

Table 18
Surplus/Deficit Analysis - Future

Facility	Monthly Surplus/Deficit (MGD)												Annual Average (MGD)	Annual Total (MGY)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec		
Collier Co. Reclaimed Supply														
Collier Co. North	(51.1)	(52.9)	(56.8)	(47.4)	(39.3)	(35.9)	(39.0)	(36.2)	(30.6)	(44.2)	(44.7)	(49.6)	(44.0)	(16,047.7)
Collier Co. South	(54.7)	(56.9)	(61.5)	(51.0)	(42.1)	(37.7)	(40.0)	(37.6)	(31.2)	(46.2)	(47.8)	(53.0)	(46.6)	(17,026.4)
Golden Gate	(5.9)	(5.6)	(5.4)	(5.6)	(5.4)	(5.2)	(6.6)	(5.9)	(10.0)	(5.8)	(5.6)	(5.9)	(6.1)	(2,220.8)
Marco Island Utilities	(3.7)	(2.9)	(3.0)	(2.9)	(1.1)	(0.2)	(1.0)	(0.4)	(2.3)	(3.3)	(3.6)	(4.2)	(2.4)	(867.6)
Naples	(9.5)	(10.0)	(10.7)	(8.3)	(7.0)	(5.7)	(4.0)	(4.6)	(4.0)	(7.3)	(7.7)	(8.9)	(7.3)	(2,666.3)
Subtotal	**(124.9)**	**(128.2)**	**(137.3)**	**(115.2)**	**(95.0)**	**(84.7)**	**(90.6)**	**(84.7)**	**(78.1)**	**(106.8)**	**(109.3)**	**(121.6)**	**(106.4)**	**(38,828.8)**
Other Sources of Supply	114.3	114.3	114.3	114.3	114.3	22.1	22.1	22.1	22.1	22.1	22.1	114.3	68.2	24,893.0
Potential Users	(16.0)	(16.0)	(16.0)	(16.0)	(16.0)	(16.0)	(16.0)	(16.0)	(16.0)	(16.0)	(16.0)	(16.0)	(16.0)	(5,840.0)
NEW Subtotal	**(26.6)**	**(29.9)**	**(39.0)**	**(16.9)**	**3.3**	**(78.6)**	**(84.5)**	**(78.6)**	**(72.0)**	**(100.7)**	**(103.2)**	**(23.3)**	**(54.2)**	**(19,775.8)**
Lee Co. Reclamed Supply														
Bonita Springs	(17.8)	(18.1)	(19.3)	(17.7)	(14.3)	(13.4)	(11.4)	(15.2)	(14.9)	(17.8)	(17.7)	(18.5)	(16.4)	(5,969.1)
Cape Coral Utilities	(31.3)	(41.6)	(46.8)	(62.7)	(63.8)	(17.9)	(8.1)	(3.9)	3.7	(36.1)	(56.9)	(35.6)	(33.4)	(12,197.9)
Fiesta Village	(3.1)	(4.6)	(3.9)	(4.3)	(4.8)	(1.2)	1.1	1.6	0.6	(2.2)	(5.6)	(3.7)	(2.5)	(914.9)
Forest Utility	(0.7)	(0.7)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(0.5)	(0.5)	(0.6)	(0.6)	(0.7)	(0.6)	(231.9)
Ft. Myers Beach	(11.8)	(9.2)	(22.8)	(23.8)	(19.0)	(12.9)	(12.3)	(12.0)	(13.7)	(16.5)	(18.0)	(12.0)	(15.3)	(5,597.9)
Ft. Myers Central	(4.6)	(4.4)	(5.5)	(6.2)	(6.3)	(3.7)	(0.9)	1.1	6.4	(1.6)	(3.7)	(4.0)	(2.8)	(1,017.2)
Ft. Myers South	6.4	6.4	6.8	6.7	5.7	6.3	9.2	11.2	13.4	8.2	6.7	6.4	7.8	2,844.6
Gateway	(3.3)	(3.1)	(3.3)	(3.0)	(3.2)	(3.3)	(3.2)	(3.9)	(3.8)	(3.8)	(3.8)	(3.6)	(3.4)	(1,256.1)

Table 18
Surplus/Deficit Analysis - Future

Facility	Monthly Surplus/Deficit (MGD)												Annual Average	Annual Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
Gulf Environmental Services	(9.0)	(8.7)	(9.6)	(8.8)	(6.9)	(6.4)	(5.4)	(7.4)	(7.3)	(9.6)	(9.4)	(9.8)	(8.2)	(2,993.1)
Lehigh Acres	(24.2)	(21.3)	(44.7)	(44.9)	(35.3)	(24.6)	(22.4)	(19.7)	(20.7)	(26.3)	(33.2)	(22.4)	(28.3)	(10,331.4)
North Ft. Myers	(17.8)	(17.5)	(14.0)	(24.5)	(18.9)	(16.4)	(12.3)	(6.0)	(9.3)	(16.9)	(17.9)	(18.5)	(15.8)	(5,778.1)
Pine Island	(5.3)	(5.4)	(5.3)	(5.3)	(5.3)	(5.3)	(5.2)	(5.2)	(5.3)	(5.3)	(5.3)	(5.3)	(5.3)	(1,928.9)
Sanibel	(2.4)	(2.6)	(2.9)	(2.7)	(1.9)	(2.1)	(3.0)	(2.2)	(2.1)	(2.1)	(3.2)	(2.0)	(2.4)	(888.3)
Waterway Estates	(1.8)	(15.3)	(2.7)	(2.4)	(2.4)	(3.3)	0.7	1.2	1.4	1.1	0.9	0.9	(1.8)	(658.0)
Subtotal	**(126.8)**	**(146.1)**	**(174.8)**	**(200.3)**	**(177.0)**	**(104.8)**	**(73.9)**	**(61.0)**	**(52.1)**	**(129.5)**	**(167.5)**	**(128.8)**	**(128.5)**	**(46,918.3)**
Other Sources of Supply	61.7	61.7	61.7	61.7	61.7	3.4	3.4	3.4	3.4	3.4	3.4	61.7	32.6	11,880.8
Potential Users	(41.0)	(41.0)	(41.0)	(41.0)	(41.0)	(41.0)	(41.0)	(41.0)	(41.0)	(41.0)	(41.0)	(41.0)	(41.0)	(14,965.0)
NEW Subtotal	**(106.1)**	**(125.4)**	**(154.1)**	**(179.6)**	**(156.3)**	**(142.4)**	**(111.5)**	**(98.6)**	**(89.7)**	**(167.1)**	**(205.1)**	**(108.1)**	**(137.0)**	**(50,002.6)**
Total Monthly Flow (MGD)	**(132.7)**	**(155.4)**	**(193.1)**	**(196.5)**	**(153.1)**	**(221.0)**	**(196.0)**	**(177.2)**	**(161.6)**	**(267.8)**	**(308.3)**	**(131.4)**	**(191.2)**	**(69,778.4)**

*These figures represent calculated values for the expected irrigation water deficit in the year 2020.

STORAGE AND DISTRIBUTION OPTIONS

Storage is the most critical part of the RIDS. Storage will be necessary in the future to optimize current sources and to balance supply and demand, especially for supplemental sources such as surface water.

The potential storage options include surface reservoirs, above ground storage tanks and ASR systems. The need to store large volumes of water lends itself more to ASR than the constructed storage infrastructure options. From a cost standpoint ASR will be much more feasible than the other options. Also, ASR has become acceptable in the regulatory environment.

The feasibility of constructing a lined surface reservoir was evaluated in the Cape Coral area. The following presents the criteria and estimated costs:

- Reservoir Area: 100 Acres
- Reservoir Depth: 12 feet
- Available Storage: 390 MG
- Pump Intake Depth: 10 feet
- Effective Storage (Not Accounting for Evaporation): 325 MG
- Net Evaporation Losses for 180 Day Period: 35 MG
- Corrected Effective Storage: 290 MG
- Land Acquisition Costs ($12,500/Acre for 160 Acres (allowing for wetlands)): $ 2,000,000
- Earth Work Costs: $ 3,600,000
- Lining Cost: $ 3,500,000
- Pumping System and Pipeline Costs: $ 500,000
- Total Costs: $9,500,000

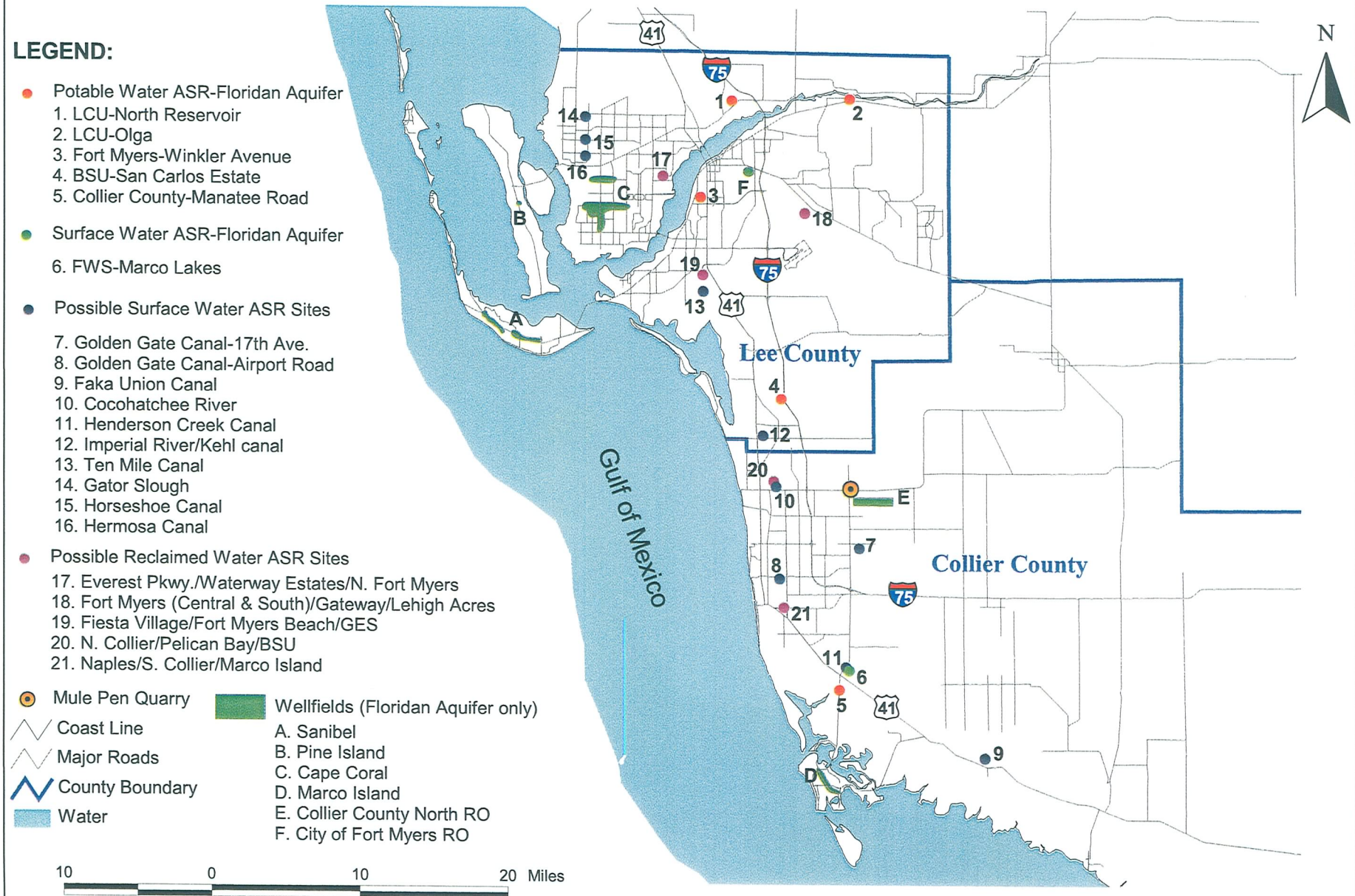
A 201 facilities plan update for Collier County evaluated a surface reservoir. It concluded that 82 acres of land would be required to store 140,000,000 gallons. The resulting cost was estimated at $14,000,000.

An ASR system with 290 MG of storage capacity (assumes 80% recovery efficiency and includes 3 ASR wells and pumping and treatment facilities) would cost approximately $2,000,000.

Land costs and permittability due to environmental issues make constructed storage systems unfeasible. As shown, the relative cost for a reservoir versus an ASR system would be approximately five times greater or more.

The potential locations of five possible reclaimed water and 10 surface water ASR systems are shown on Figure 27 and quantified in Table 19. A minimum distance of two miles from existing and permitted future municipal reverse osmosis (RO) supply wells and potable water ASR systems was used in the site selection process. Also, a semi-regional approach for reclaimed water ASR systems

was utilized in order to maximize the recharge capacity of such systems while also providing some flexibility in siting.



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	CURRENT AND POTENTIAL ASR AND WELLFIELD LOCATIONS	Figure No. 27

Table 19
Summary of Potential ASR Systems

Irrigation Supply Source	General Location	Potential Dry Season ASR Recovery (MGD)[2]	Number of Wells	Type
Caloosahatchee River	S-79	25	35	Surface Water ASR
Golden Gate Canal System	17th Ave SW	20	27	Surface Water ASR
Golden Gate Canal System	Airport Rd.	25	34	Surface Water ASR
Faka Union Slough	0.5 miles north US 41	25	34	Surface Water ASR
Cocohatchee River	Willoughby Acres bridge	5	7	Surface Water ASR
Imperial River*	Orr Rd.	15	20	Surface Water ASR
Henderson Creek Canal	Near US 41	7	10	Surface Water ASR
Ten Mile Canal	1.05 mi north of Alico Rd	12	16	Surface Water ASR
Gator Slough	Near SR 765	7	10	Surface Water ASR
Hermosa Canal	Near SR 765	3	4	Surface Water ASR
Horseshoe Canal	Near SR 765	3	4	Surface Water ASR
Naples WWTP/South Collier/Marco Island Regional	To be Determined	7.5	10	Reclaimed Water ASR
North Collier/Pelican Bay/BSU Regional	To be Determined	4	6	Reclaimed Water ASR
GES/Fiesta Village/Ft. Myers Beach Regional	To be Determined	5	7	Reclaimed Water ASR
Everest/Waterway Estates/North Ft. Myers Regional	To be Determined	2	3	Reclaimed Water ASR
Ft. Myers Central/Ft. Myers South/Gateway/ Lehigh Acres Regional	To be Determined	9	12	Reclaimed Water ASR

* = No salinity control structure

GEOGRAPHIC SUBREGIONS

The original organizational options included a large regional system, or possibly a utility-based infrastructure. Shortly after concluding the supply/demand analysis, it was determined that a subregional analysis would be the best option for evaluation. One large regional system would create an additional layer of management that would add unnecessary complexities to the project. A utility-by-utility basis would likely come up with alternatives that are similar to those presented here, but would neglect the option of sharing water when one utility is in surplus and another is in deficit. Therefore, the subregional approach was established to be the best solution to peak dry season demands while taking into account the seasonal variability of water demands seen in South Florida. Alternatives for each subregion consist of both surface water and reclaimed water ASR, interconnects between utilities, and water withdrawal from area mine pits.

The criteria for the subregional groupings were:

1. Common utility ownership
2. Existing relationships between utilities including existing interconnects
3. Projected irrigation needs
4. Potentially available supplemental sources of supply
5. Feasibility of utilizing the potential supply options by certain utilities without an interconnect

The five subregions are:

1. Cape Coral, Waterway Estates, and North Ft. Myers
2. Ft. Myers Central, Ft. Myers South, Gateway, and Lehigh Acres
3. GES, Fiesta Village, and Ft. Myers Beach
4. North Collier County, Pelican Bay, and Bonita Springs
5. Naples, South Collier County, and Marco Island

An illustration of the five subregions can be seen in Figure 28.

All alternatives within the five subregions for ASR, interconnects, and mine pit withdrawal have been generally located and are shown in Figures 29 through 33.

Cape Coral, Waterway Estates, and North Ft. Myers

In this subregion, three locations for surface water ASR were sited. These include withdrawing water from Gator Slough, Horseshoe Canal, and Hermosa Canal. For Gator Slough, it is estimated that 9 wells and a pumping station could be put into service to withdraw approximately 7 MGD. Horseshoe and Hermosa Canals would both have 4 wells and a pumping station and could supply 3 MGD each. Additionally, a possible site for reclaimed water ASR is located within the City of Cape Coral and consists of 3 wells and a pumping station. The reclaimed water ASR would result in about 2 MGD of additional water during the dry season.

There is also a possible site for an interconnect between Cape Coral and North Ft. Myers that would allow water to be shared between the two systems.

Finally, there are 3 mine pits just north of the Lee County line from which water could be extracted to feed into the reclaimed system after mining operations have ceased. This practice has a precedent in Collier County, where water is taken from Mule Pen Quarry and fed directly into the reuse system to supplement irrigation needs. It is estimated that withdrawal from the Limerock, Jay Rock, and Babcock Mine Pits would result in approximately 3.4 MGD of supplementary water.

Taking a sum of these options results in roughly 18.4 MGD of additional water resources for the area. This is equal to a cost of $0.48 per thousand gallons of water.

Ft. Myers Central, Ft. Myers South, Gateway, and Lehigh Acres

A potential reclaimed water ASR site is located within Ft. Myers and consists of 12 wells and a pumping station. The reclaimed ASR would supply an additional 9 MGD of irrigation water during the dry season.

There is also a possible interconnect that would allow water to be disposed of by Lehigh Acres and Ft. Myers South by sending their excess reclaimed water to Gateway, which is a high growth area.

Approximately 9 MGD of supplemental water resources were identified within this subregion. This amounts to a cost of $0.57 per thousand gallons of water.

GES, Fiesta Village, and Ft. Myers Beach

A potential surface water ASR site is located in this area. Withdrawing water from Ten Mile Canal, using 16 wells and a pumping station would supply approximately 12 MGD. Additionally, there is a possible site that could be used for a reclaimed water ASR project. This is located within south Ft. Myers and consists of 7 wells and a pumping station. The reclaimed water ASR site would provide about 5 MGD of supplementary irrigation water.

There is also a possible interconnect that would allow water to be disposed through a series of systems and sent south down I-75 to the GES service area, which suffers from large water shortages during the dry season.

Totaling these options concludes that approximately 17 MGD of additional water resources can be found in this area. This is equal to a cost of $0.52 per thousand gallons of water.

North Collier, Pelican Bay, and Bonita Springs

In this subregion, three locations for surface water ASR were sited. These consist of withdrawals from the Cocohatchee Canal, Imperial River, and the Golden Gate Canal at 17th Avenue. For the Cocohatchee, it is estimated that 7 wells and a pumping station could be put into service to withdraw approximately 5 MGD. The Imperial River would have 20 wells and a pumping station, resulting in 15 MGD. With respect to the Golden Gate Canal at 17th Ave., it is estimated that 27 wells and a pumping station could be put into service to supply approximately 20 MGD. Additionally, there is a possible site that could be used for a reclaimed water ASR project. This is located north of Immokalee Road between I-75 and Tamiami Trail and consists of 6 wells and a pumping station.

The reclaimed water ASR would produce approximately 4 MGD of additional water during the dry season.

There is also a likely site for an interconnect between Bonita Springs and North Collier County, which would allow water to be shared between the two systems. This pipeline would be located along US 41 at the boundary between Lee and Collier County. An interconnect involving the Golden Gate Wastewater Treatment facility was considered, but is not economically feasible at this time, due to lack of existing infrastructure and a relatively low benefit (1 MGD). This option should be examined further in the feasibility study for this region.

During the wet season, there is an additional option of withdrawing surface water to feed directly into the reclaimed system (with proper filtration and disinfection). This could provide an additional 6 MGD of irrigation water.

Finally, there is a mine pit in the Golden Gate area that could be utilized after mining operations have ceased. This source could provide 1.5 MGD of supplementary water.

Together, these options generate nearly 51.5 MGD of additional water resources for the area. This is equal to a cost of $0.57 per thousand gallons of water.

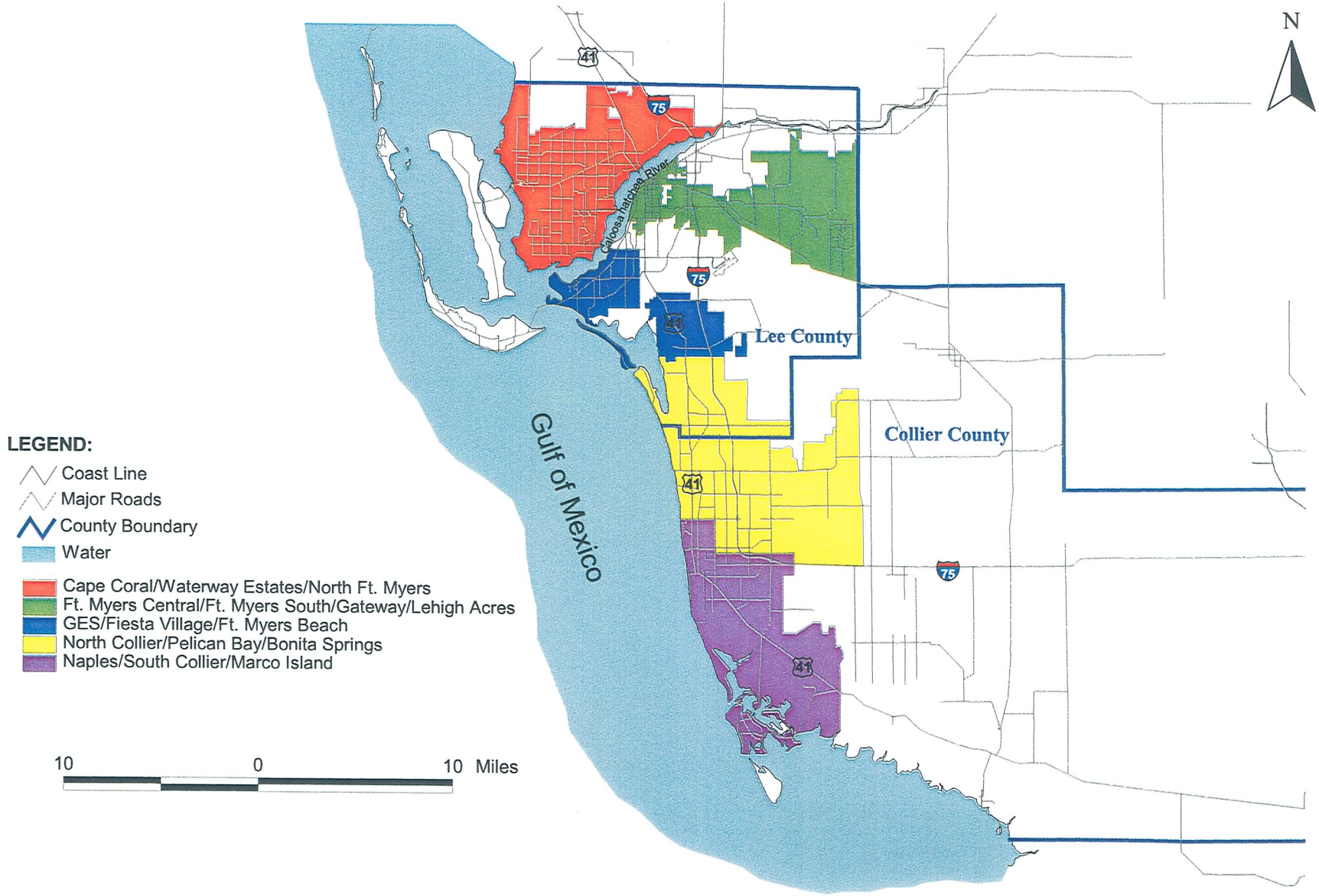
Naples, South Collier, and Marco Island

Two locations for surface water ASR were found in this subregion. These include withdrawing water from the Faka Union Canal and the Golden Gate Canal. The Faka Union Canal and the Golden Gate Canal at Airport Road would both have 34 wells and a pumping station, resulting in 25 MGD each. Additionally, there is a site that could be used for a reclaimed water ASR project. This is located within Naples at the northwest corner of Davis Boulevard and Airport Pulling Road and consists of 10 wells and a pumping station. The reclaimed water ASR system would furnish roughly 7.5 MGD of additional water during the dry season.

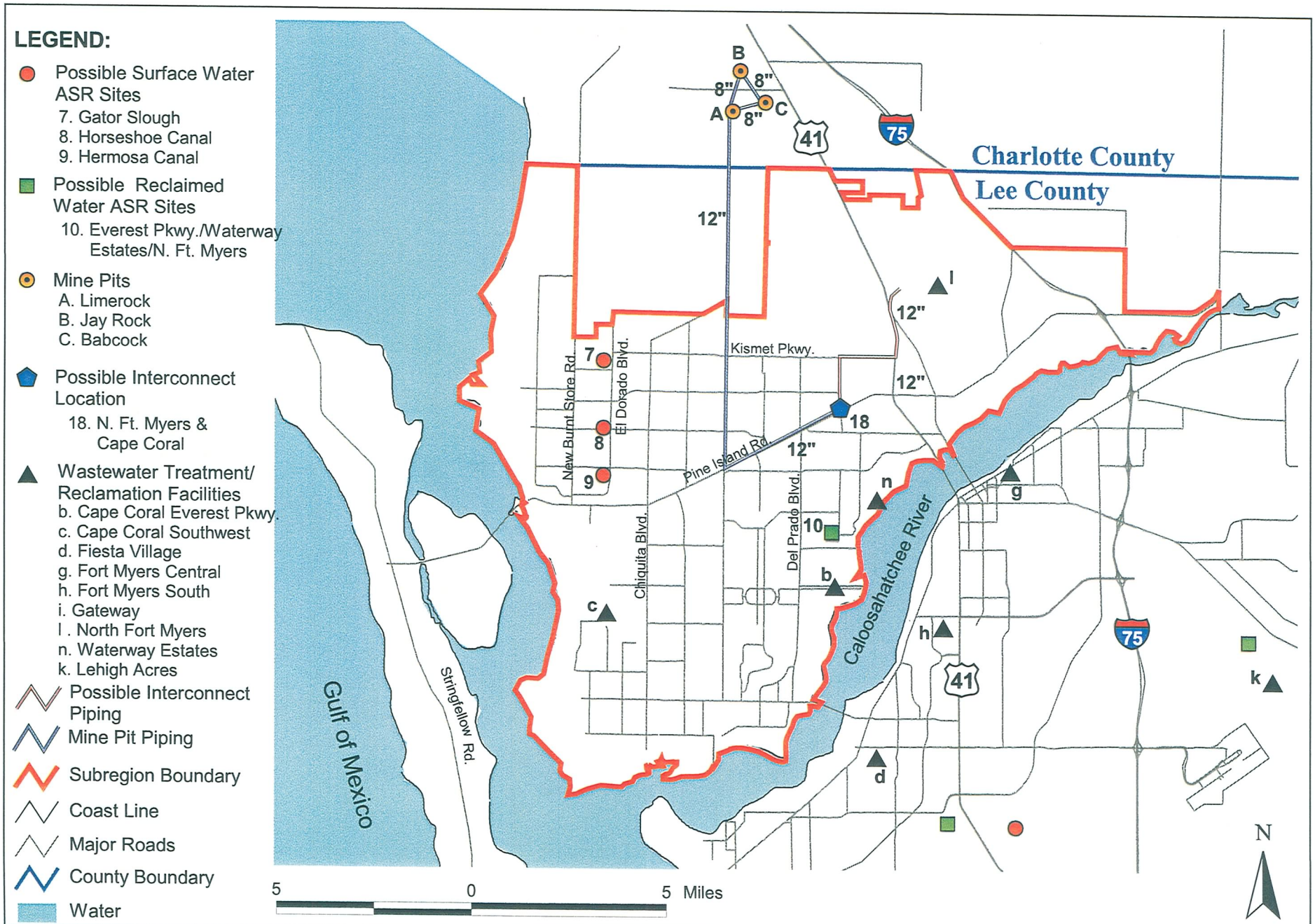
There is also an opportunity for an interconnect between Naples and South Collier, which would allow water to be shared between the two systems. A probable location for the interconnect would be at Golden Gate Parkway and Livingston.

During the wet season, there is an additional option of withdrawing surface water to feed directly into the reclaimed system (with proper filtration and disinfection). This could provide an additional 14.6 MGD of irrigation water.

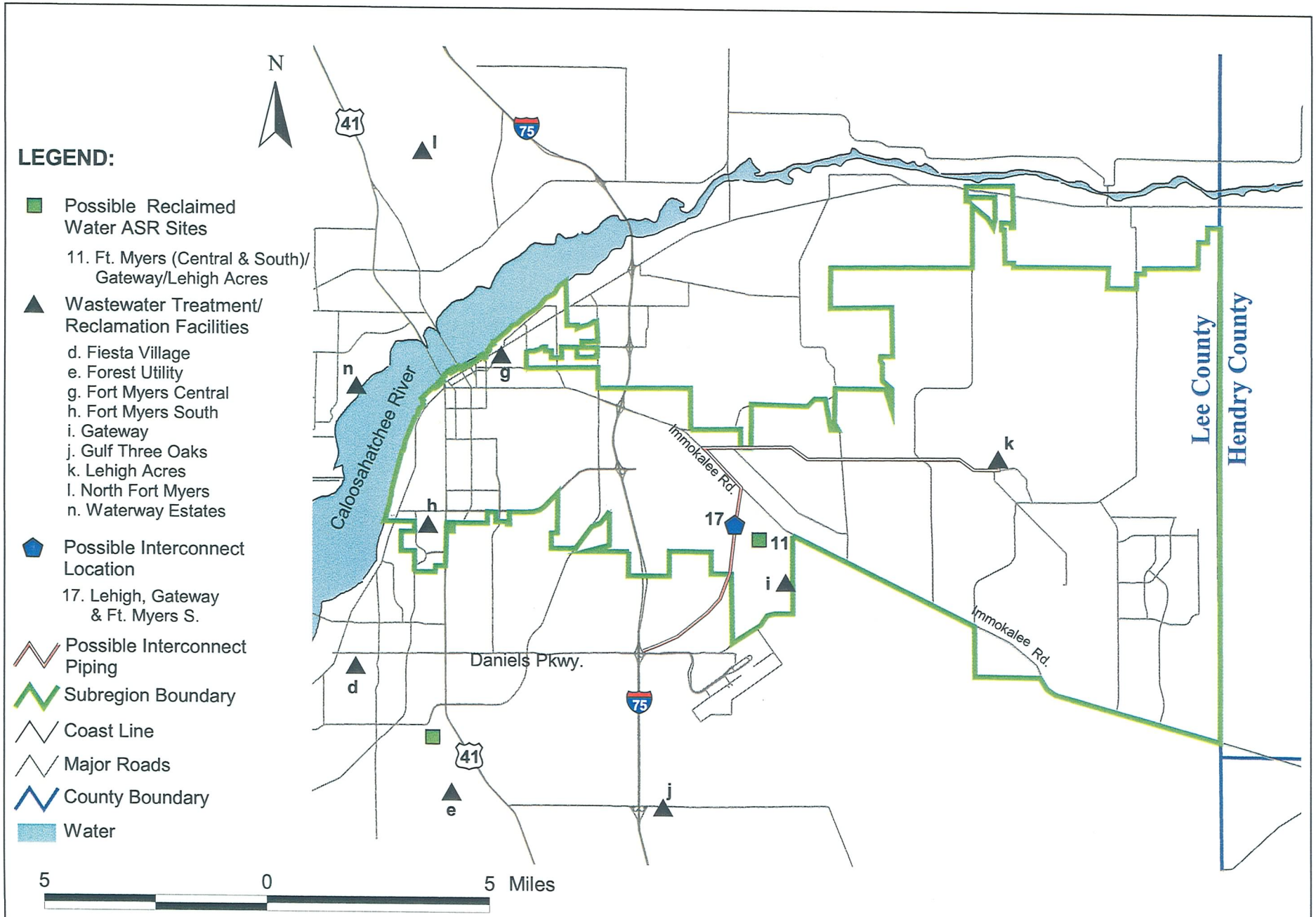
Taking a sum of these options results in a little over 72 MGD of additional water resources for the area. This is equal to a cost of $0.56 per thousand gallons of water.



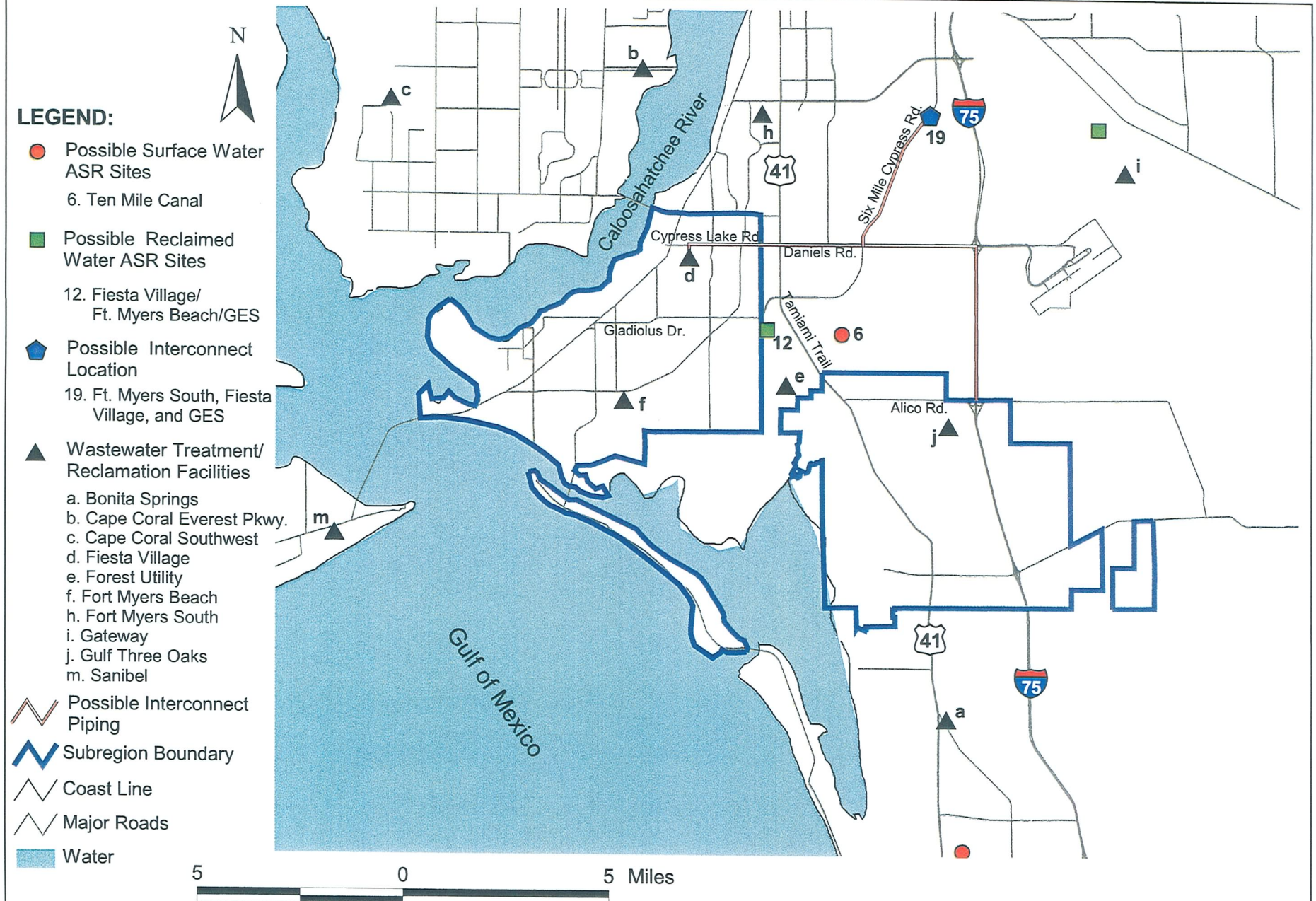
Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	POTENTIAL SUBREGIONAL GROUPS	Figure 28



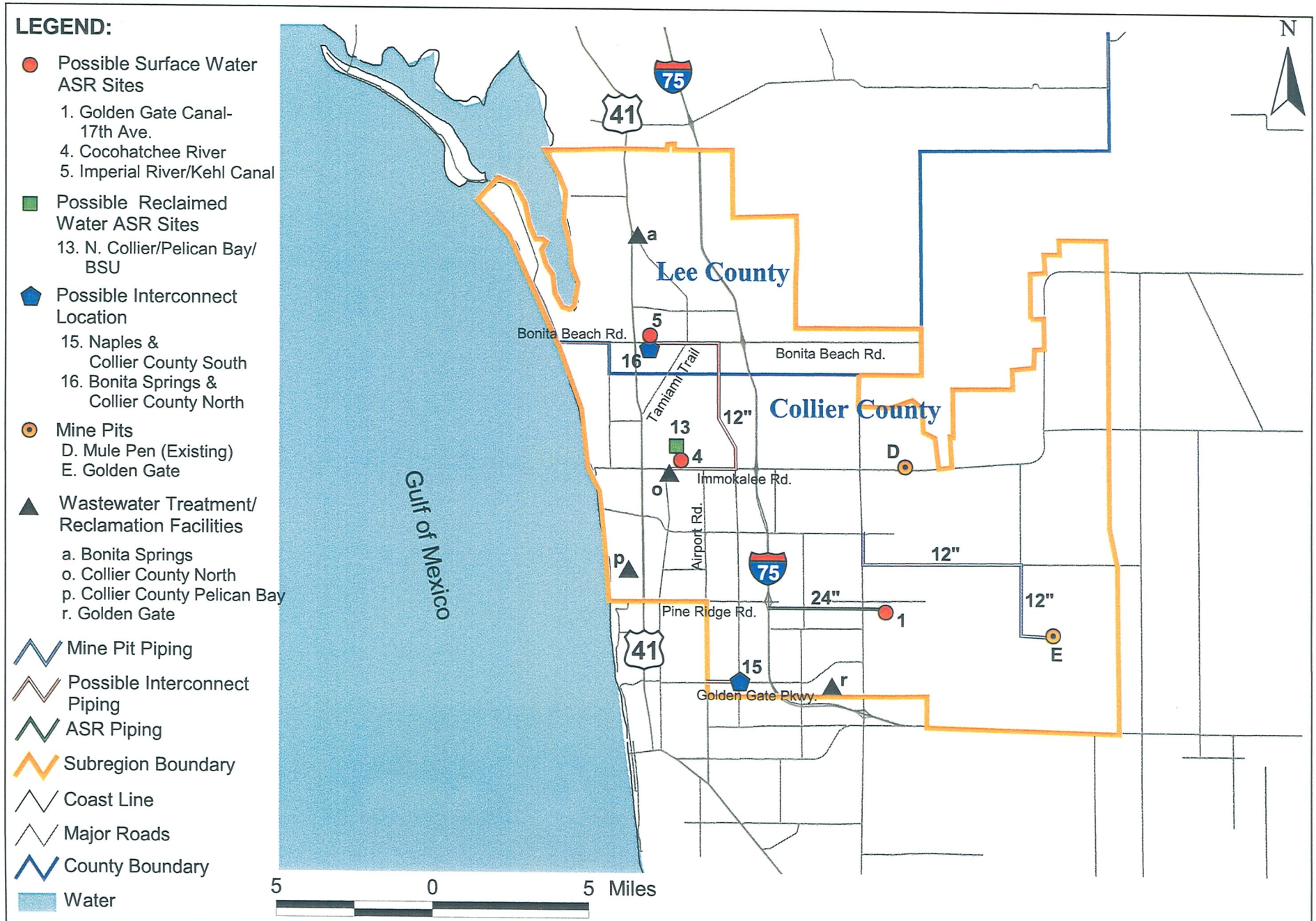
Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Cape Coral/Waterway Estates/North Ft. Myers Subregional Group	Figure 29



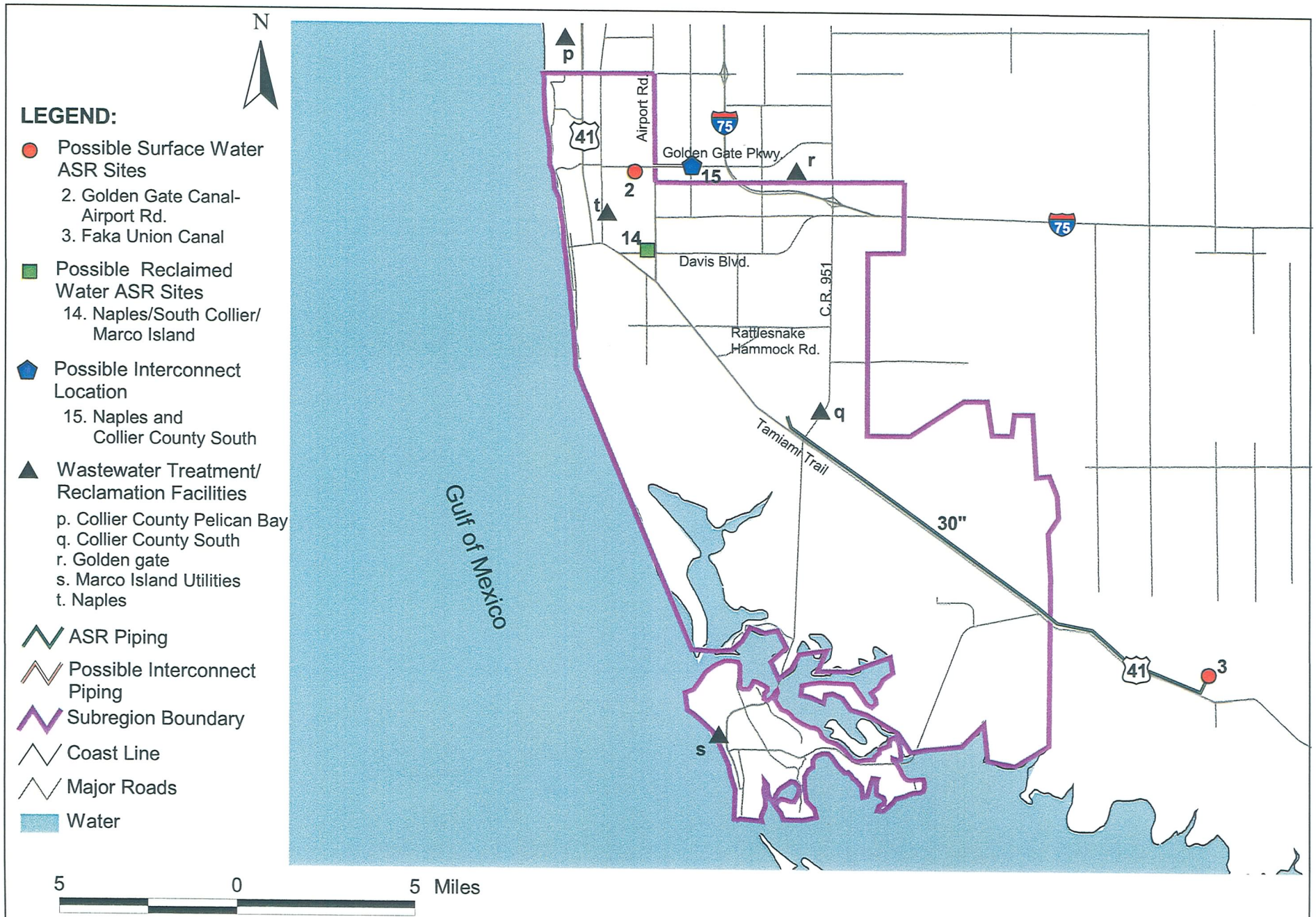
Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Ft. Myers Central/Ft. Myers South/Gateway/ Lehigh Acres Subregional Group	Figure 30



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Fiesta Village/Ft. Myers Beach/GES Subregional Group	Figure 31



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	North Collier/Pelican Bay/Bonita Springs Subregional Group	Figure 32



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Naples/South Collier/Marco Island Subregional Group	Figure 33

COST ANALYSIS

In order to develop a preliminary cost estimate associated with the RIDS project the various potential projects have been analyzed on a subregional basis. Table 20 presents the costs of each subregion's proposed irrigation water resources projects as previously described. The costs for each subregion consider the cost of financing the initial project capital costs, including assumptions about potential grand funding, and annual operations and maintenance expenses. These costs are then divided by the expected production of irrigation water resources for the identified projects to determine the average cost of the irrigation water resources for each subregion. As shown in the summary below, the average cost of the irrigation water resources as identified herein range from $0.48 to $0.57 per one thousand gallons.

These cost estimates as summarized on a subregional basis include the itemized construction costs for the various wells, pumping stations and pipelines that make up the projects, including engineering costs and contingencies. In order to develop estimates of the annual cost per gallon associated with the output from each project and region we have assumed that the initial capital cost will be financed partially from loan agreements with the FDEP's State Revolving Fund (SRF) Loan Program and partially with grants from EPA, the South Florida Water Management District, and the Governor's Program. In order to estimate the debt service for each project the following assumptions and considerations were relied upon:

- For each subregion, we have assumed that $3,500,000 in grants from EPA, the South Florida Water Management District, and the Governor's Program, would be available to offset the initial capital costs annually for up to four years but never totaling more than fifty percent (50%) of the subregion's initial capital project cost.

- The initial project costs to be financed with debt will be financed over a twenty (20) year period at a rate of 3.5%;

- The cost to be financed includes administrative fees equal to two percent (2%) of the initial project capital costs as required by the terms and conditions of the SRF Loan Program;

- The cost to be financed includes funding of a loan repayment reserve equal to three percent (3%) of the initial project capital costs being borrowed as required by the terms and conditions of the SRF Loan Program, and

- The cost to be financed includes twenty-four (24) months of capitalized interest based upon construction funding draws during the assumed project engineering and construction period.

- Total capital costs for each subregion include debt service and an allowance for debt service coverage equal to 25% of the annual debt service.

- The allowance for debt service coverage is based upon the SRF Loan Program's minimum debt service coverage requirement of 15% adjusted upward to also reflect the need for funding capital renewals and replacements that may occur during the term of the loan agreement.

In order to estimate the cost of each subregion's irrigation water resource projects an estimate of annual operations and maintenance costs was also considered. The annual operations and maintenance costs estimated for each RIDS project include:

- The cost of electricity for pumping;
- General maintenance of the facilities;
- Submersible pump maintenance;
- Adjustment of injection rates and measurement of water quality;
- Weekly water sample procurement for laboratory analysis;
- Semiannual calibration of flowmeters and gauges;
- Preparation of monthly regulatory reports; and
- Cost for chemicals, pretreatment, and filtration prior to injection.

The annual operations and maintenance costs were added to the annual capital related financing costs to estimate the total costs for each project and subregion. In order to calculate the cost per gallon for each subregion it was assumed that the total annual production of each project would be approximately equal to 180 days of production based on the project capacity measured on an average daily basis. An additional line is shown for the cost per thousand gallons assuming no grant funding is available. This is displayed for informational purposes only.

Table 20
Summary of Total Costs by Subregion

Subregion	1	2	3	4	5
	Gator Slough Horseshoe Canal Hermosa Canal Cape Coral/Water-Way Estates/ N. Fort Myers	Ft. Myers Central & South/Gateway/ Lehigh Acres	Ten Mile Canal GES/ Fiesta Village/ Fort Myers Bch.	Cocohatchee & Imperial Rivers Golden Gate Canal (SW 17th Ave.) North Collier/ Pelican Bay/ Bonita Springs	Golden Gate Canal (Airport Road) Faka Union Slough Naples/South Collier/ Marco
Annual Debt Service	$1,027,900	$605,100	$1,031,700	$3,622,600	$5,119,800
Debt Service Coverage(1)	256,975	151,275	257,925	905,650	1,279,950
Annual O & M Costs (2)	303,251	160,617	299,684	761,536	909,129
Total	$1,588,126	$916,992	$1,589,309	$5,289,786	$7,308,879
Production:					
MGD	18.4	9.0	17.0	51.5	72.1
Average Days Per Year	180	180	180	180	180
Annual gallons (000)	3,312,000	1,620,000	3,060,000	9,270,000	12,978,000
Cost per 1000 gallons	$0.48	$0.57	$0.52	$0.57	$0.56
Cost per 1000 gallons w/out grant funding	$0.87	$1.03	$0.94	$0.72	$0.67

(1) The debt service coverage funding amounts shown represent an allowance of 25% of the annual debt service based on the SRF Loan Program's minimum coverage requirement of 15% adjusted upward to also reflect the need for funding certain renewals and replacements that may occur during the term of the loans.

It is important to note that any preexisting deficiencies at the treatment plants considered in this study were not included in this analysis. It was assumed that all plants would be providing the appropriate treatment to meet primary and secondary standards. All background information can be found in Attachment G.

INSTITUTIONAL FRAMEWORK

The implementation of the RIDS program could be facilitated by a number of institutional approaches or frameworks to oversee design, construction, development, funding and operation.

In practice, various types of interlocal agreements have been used to own, operate, and govern regional utility water supply and wastewater treatment projects. These range from the formation of a separate and distinct entity such as a utility authority to arrangements where one party is the prime sponsor with respect to financing and operations and the other regional participants are enjoined through a contractually binding bulk sales agreement or capacity entitlement and cost sharing arrangement.

Typically, where an authority serves the needs of several local governments, there is a governing board made up of members representing the participating governments and a separate administrative and operating staff. In the prime sponsor type of arrangement, there may be a governing board to oversee the operational aspects and ongoing financial considerations of the project or there may be an interlocal agreement that spells out contractually the terms and conditions of service with respect to such things as capacity entitlements and cost sharing.

A review of examples of the successful implementation of regional utility projects with benefits similar to the RIDS show that each of these ownership and operating arrangements have somewhat unique features.

Regional Authority

The Peace River/Manasota Water Supply Authority (PRMWSA) was formed by interlocal agreement in 1982 among five (5) different counties with the original purpose of defining each county's rights to the water supply within its boundaries. Recognizing the benefits of a regional water supply project, the PRMWSA has evolved into a regional wholesale water supplier made up of four different counties. The authority owns and operates water production facilities including supply, treatment, storage and transmission facilities necessary to deliver bulk water supply to the participating counties. The governing board of the authority is composed of one director from each of the four participating counties. The authority issues debt to fund capital projects and the pledge to pay off the debt is based upon revenues from long-term water supply contracts between the authority and each of the participating counties. The water supply contracts allocate the water production capacity to each participant along with the obligation to pay an allocated share of the project's debt service. Operating costs are apportioned based on actual deliveries to each county.

Prime Sponsor

A different type of regional arrangement is represented by the East Central Regional Entities Board (ECREB) which oversees the operation of a regional wastewater treatment plant that provides bulk wastewater treatment and disposal services to the cities of West Palm Beach, Lake Worth, Riviera Beach, the Town of Palm Beach and portions of unincorporated Palm Beach County. Based on a 30-year Interlocal Agreement established among the project participants in 1992, the City of West Palm Beach is the prime sponsor of the project and operates and manages the wastewater treatment facility on behalf of the participants. Under this arrangement, the City of West Palm Beach incurs the debt to finance the project, retains legal title to the facilities and any future improvements or

expansions, provides bulk wastewater treatment services to the participants, and is reimbursed by the participants for the costs incurred to operate and manage the facilities. Thus, while the prime sponsor is the legal owner of the assets, all aspects of the operation and management of the wastewater treatment facilities are overseen by the ECREB, which includes a representative from each participating entity. Their responsibilities include operations, operating and capital budget approval, and construction of new facilities.

O&M by Prime Sponsor/Shared Ownership

Another version of the prime sponsor approach was used by a group of several communities in Bay County, Florida to develop a regional wastewater treatment plant. The participants included the County and the cities of Callaway, Springfield and Parker, and the Town of Cedar Grove. In this approach, a prime sponsor has been designated to operate and manage the project. However, the assets are owned by all of the participants and the participants have the right to choose a new operator after the first five years of operation. The operator is charged with the responsibility to hold, invest and spend monies on behalf of the project owner/participants, to formulate and execute management policies and practices, to operate, maintain and expand the wastewater treatment system, maintain and hold all wastewater treatment permits, maintain financial records and set the budget and rates for service. There is no governing board that oversees the project. All terms and conditions of service and the rights of the owners are set forth contractually.

Interlocal Agreements

In some instances the interlocal agreements and institutional arrangements are tailored to suit the specific situation and the strengths and needs of the participants. In one regional water supply arrangement, the Destin Water Users, Inc. (DWU), the South Walton Utility Company (SWUC) and the Regional Utilities of Walton County (RUWC), all member-owned and operated utility systems, have jointly developed a regional water supply project. All three utilities relied on pumping from coastal wellfields that are scheduled for future production cutbacks and thus needed additional water supply. Two of the parties, DWU and SWUC were able to acquire and permit a wellfield remotely located with respect to their utility systems but near a major transmission supply line owned by the third party, RUWC. In the arrangement that was negotiated among the parties, SWUC developed and owns the wellfield supply, treatment and storage facilities. The water is then delivered to interconnections for use by all three utility systems by the RUWC transmission line, which receives compensation in the form of a wholesale charge. DWU purchases water from SWUC through a long-term water supply contract that includes their share of the cost of supply, treatment, storage and transmission costs based on the cost of water production facilities owned by SWUC and water transmission facilities owned by RUWC. The purchase prices are adjusted for cost offsets for its share of the land acquisition and permitting costs that were initially jointly funded by DWU and SWUC. RUWC purchased some of the land from the other parties and owns one well on the property and shares in the cost of water treatment, storage and pumping facilities and operations with the other two parties in addition to receiving the revenue from the transmission wheeling charges. In this rather complex arrangement one can see how interlocal or supply agreements can be tailored in unique ways to satisfy the needs of the regional participants.

A separate regional entity would provide advantages by improving the ability to approach supply issues and cost considerations as a whole with less individual project constraints. The regional approach could facilitate a more fluid movement of irrigation water resources throughout the region from areas with surplus supplies to those areas with insufficient supplies. It also could allow

consistent pricing throughout the region. However, a regional approach eliminates the opportunity for each individual participant to make its own decisions as to how to best provide and utilize irrigation quality water resources on behalf of its community. Also, the cost of establishing an additional layer of government including the cost of additional utility administrative and operating personnel and the cost of governance would be a disadvantage. It is likely that much of what can be accomplished in the region to establish an irrigation quality water distribution system could be done less costly if the projects are developed among the individual participants or through some type of subregional arrangement that relies on the existing personnel and resources of the individual systems that participate.

The advantages of the project-by-project or subregional approach is that individual arrangements can be developed that are flexible in dealing with ownership and operating issues in a way that satisfies all of the jurisdictions involved. This type of institutional approach may ensure more active and better participation among the involved parties. Also, it is anticipated that the project cost would be lower because there would be very little redundant administrative and operating costs. The utility representatives that are participating in developing the Master Plan strongly favor a project-by-project or subregional approach to the development of irrigation water resources.

FUNDING SOURCES AND OPTIONS

Florida Department of Environmental Protection (FDEP) State Revolving Fund Loan Program – Wastewater and Stormwater

The State Revolving Fund Loan Program (SRF) provides low-interest loans for planning, designing, and constructing water pollution control facilities. Federal Capitalization Grants and State match appropriations of 20% have funded the SRF. It is a "revolving" fund because loan repayments are used to make additional loans. By federal law, the SRF is to be operated in perpetuity. The FDEP solicits project information each year. The information is used to establish project priorities for the following annual cycle. Funds are made available for Preconstruction Loans and Construction Loans. The loan terms include a 20-year amortization and low interest rates, which represent a 40% discount off bond rates.

Preconstruction loans are available to all communities and provide up-front disbursements for administrative services, project planning and project design.

Construction loans are also available to all communities and provide for construction costs and technical services during construction.

Approximately $120M/yr is available. The current interest rate is 3.09%.

FDEP State Revolving Fund Loan Program – Drinking Water

The Drinking Water State Revolving Fund (SRF) Program provides low-interest loans for planning, designing, and constructing public water facilities. Federal Capitalization Grants and State match appropriations of 20% have funded the SRF. It is a "revolving" fund because loan repayments are used to make additional loans. By federal law, the SRF is to be operated in perpetuity. The Department solicits project information each year from January 1 to February 15. The information is used to establish the project priority list for the following annual cycle. Funds are made available for Preconstruction Loans to rate-based public water systems, Construction Loans of $75,000 minimum or more, and Preconstruction Grants and Construction Grants to financially disadvantaged communities.

The loan terms include a 20-year (30-year for financially disadvantaged communities) amortization and low interest rates, which represent a 40% discount off bond rates. Small community assistance is available for communities having populations less than 10,000. Each year 15% of the funds are reserved exclusively for their use. In addition, small communities may qualify for loans from the unreserved 85% of the funds.

Approximately $40M/yr is available. The current interest rate is 3.09%.

SFWMD Alternative Water Supply Grant Program

In 1995, the Florida Legislature enacted the Alternative Water Supply Grant Program to increase the potential for the development of alternative water supplies in the state and to help utilities develop cost-effective reclaimed water supplies.

The Program is a cost share program that provides a portion of funding for alternative water supply projects built by local, county, or private water purveyors. To be considered for the program, a project must be consistent with the local government plan and must be located in a Water Resource Caution Area. Funding support is limited to capital or infrastructure costs for alternative water supply systems.

The available funds vary annually as determined during the District's budget process.

SFWMD Water Resource Development Program

Water resource development projects are generally regional in nature and are primarily the responsibility of the District. Each water management district is required to include in its annual budget the amount needed for the fiscal year to implement water resource development projects as prioritized in its regional water supply plans.

The traditional source of funding has been ad valorem taxes. Projects are ranked and prioritized along with projects in all other regional water supply plans during annual District budget preparation and funded as money is available. Priority considerations for a project include availability of a cost-share partner and if a project makes 'new' water available. Sustainability of the regional system is also an important consideration.

State Funds - The new 'Governor's Program' – (Formerly WAP Grant Program)

The proposed budget provides $35M to fund water resource restoration projects.

Projects eligible for the funding must address such criteria as resolving violations of state water quality standards, preventing drainage and flood control problems, resolving public health threats and protecting the environment. Financial capability of the local government is also a deciding factor.

The program includes grants covering wastewater, stormwater, surface water restoration and water management projects.

The WAP funding was applied for through the FDEP, which evaluated if the project met the program's criteria. There was no priority process and the legislature decided on awarding the funding (who and how much) subject to the Governor's veto.

Currently, funds are requested through a Community Budget Issue Request/Special Appropriation Process. The FDEP will review the request and make recommendations as to appropriateness of the project to the program.

Federal Funds – EPA State and Tribal Assistance Grants

The United States Environmental Protection Agency makes funds available for special water supply projects through its State and Tribal Assistance Grant (STAG) program.

The projects must be included in an appropriation bill passed by the Senate and House.

Approximately $2M/yr per project in grant funds is typically available for projects the size of RIDS.

Local Funds – Developer Contributions/Impact Fees/User Fees (Rates)

Revenue derived from the collection of impact fees could be used to fund portions of the project. Additionally, requirements could be placed on developers to provide or construct portions of the system within particular developments reducing the total cost of the distribution system.

Revenue generated through rates is normally used for O&M costs.

Bonds

Issuance of bonds could provide for project funding; however, due to the costs of issuance, interest rates, coverage and other financial considerations, this would be a last resort option.

Funding Strategy

As depicted in the diagram below, it is recommended that the base funding for the RIDS project be the FDEP SRF program loans. The low interest rates (approximately 3.09%) and repayment terms (20 years) make them the most attractive form of overall financing.

The SRF program provides for the flexibility to draw funds only when needed and allows for application of grant funds when received. Unlike bond funds, there is no arbitrage or pre-payment penalties.

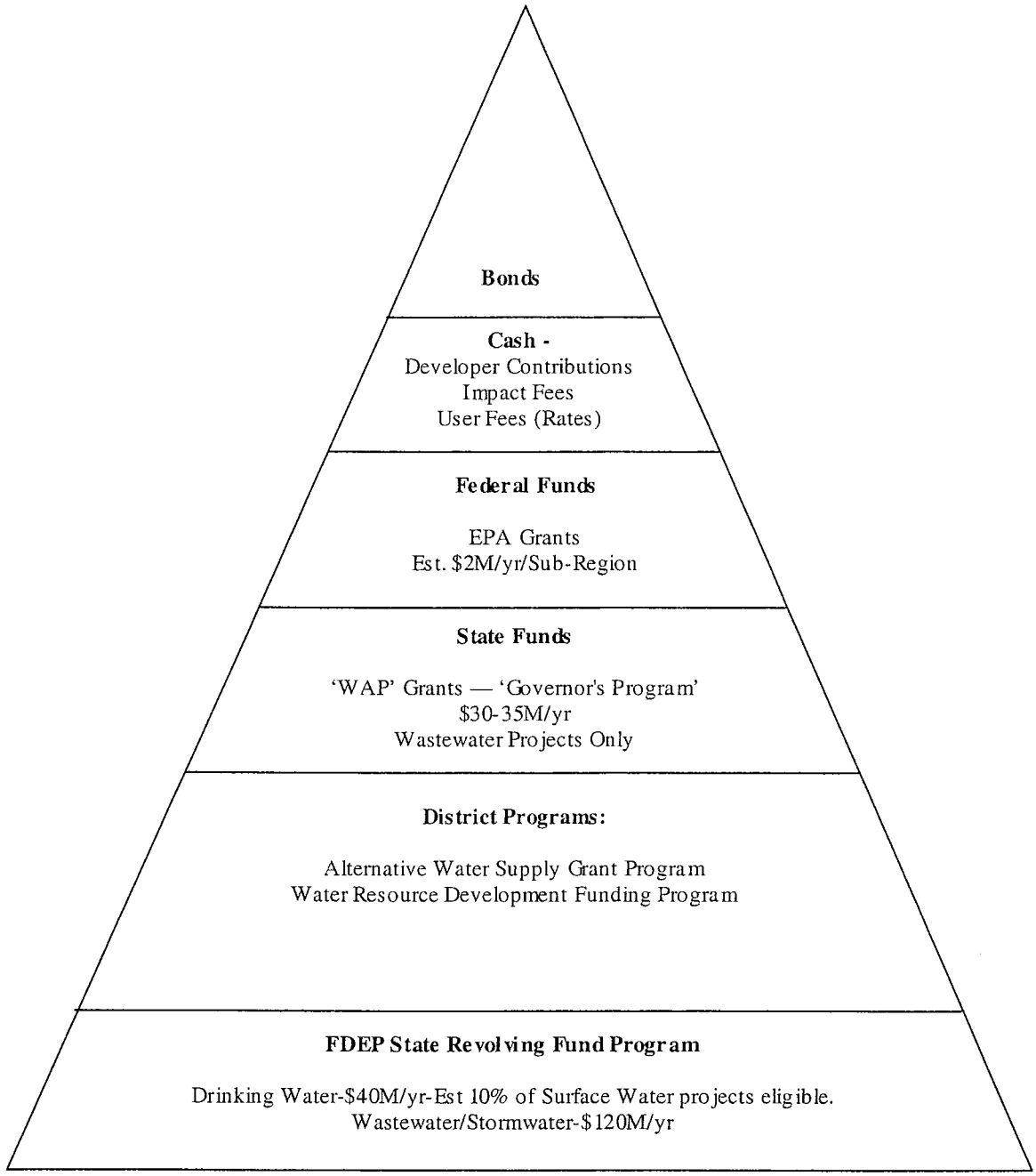
After this base funding is secured, it is recommended that district, state, and federal grant funds be sought and secured to negate the use of borrowed funds where possible.

A significant increase in the District's Water Management and Planning budget (vs. 2002) would be required to support further development of the program as well as dedication of revenues to provide grants for construction funding.

Cash reserves in the form of Developer Contributions and Impact Fees would be considered the third level of funding with bond proceeds considered the least attractive form of funding due to financing costs.

Figure 34

Funding Strategy



It is assumed that user fees (rates) will pay for Operating and Maintenance costs.

Project Timing and Phasing

It is assumed that the project would be phased to provide system resources based on need. Consideration should also be given to phasing of the service areas as individual areas' economics/demographics may allow them to better 'compete' for funding versus other areas or the total project as a whole.

Funding Next Steps

The next steps in the funding process should relate to defining the institutional framework in which the project will be built and operated; determining funding eligible activities; projecting the availability of funds over the schedule of the project; documenting the special conditions and requirements of the various funding programs; defining the limitations of and concerns about using the various programs; and estimating the end user impact of the financial plan.

It is imperative that all the participants benefit from the financial incentives resulting from grant and low interest loan funding to encourage full participation in the RIDS program.

ASSESSMENT OF CURRENT POLICIES, PROCEDURES, AND REGULATIONS

Florida Department of Environmental Protection (FDEP) Regulations

The FDEP, an agency established by the State of Florida to govern over environmental issues within the State of Florida, has prepared regulations pertaining to water use, reuse, and other relevant aspects of the RIDS project.

Chapter 62-40, FAC – Water Policy

Chapter 62-40, FAC, contains FDEP policies on water resources in Florida and establishes a cooperative relationship with the Water Management Districts in water resource issues. Under the general water policy provisions, reclaimed water is specifically identified as an integral part of water management programs. FDEP also encourages the use of water of the lowest acceptable quality for the purpose intended. Under the water use guidelines, it is stated that no water use permit shall be granted by the Water Management District unless the applicant demonstrates a reasonable beneficial use for that water.

Chapters 62-520 & 522, FAC – Ground Water

The relevant chapters on the subject of ground water focus on protecting the present and future most beneficial uses of ground waters of the state. To ensure their protection, classifications for ground waters of the State have been established. Appropriate water quality designations are outlined in these chapters.

Chapter 62-520, FAC, contains the minimum criteria for ground water and classification descriptions ranging from G-1 (which has the most stringent regulations), to G-IV (the least stringent). This chapter also includes a list of exemptions for each class of ground water.

Chapter 62-522, FAC, discusses ground water monitoring and permitting. This includes recharging aquifers with surface water and reclaimed water ASR. An allowable zone of discharge is expressed for each classification, and monitoring requirements and exemptions are also discussed.

Chapter 62-528, FAC – Underground Injection Control

The Underground Injection Control Program (UIC) is a delegated federal program authorized under the EPA Safe Drinking Water Act. It is under this program that ASR wells are permitted. All wells included in the RIDS would fall under the Class V category, and would most likely be in Group 7 (Aquifer Storage and Recovery System Wells).

Aquifer Storage and Recovery

As indicated above, FDEP rules contained in Chapter 62, Section 528 of the Florida Administrative Code (FAC), govern the permitting and operation of ASR wells. Subsection 300 is of special interest in the permitting of surface water and reclaimed water ASR wells. This portion of the regulations deals with aquifer exemptions. Such exemptions may be needed for certain injection water quality parameters, such as color, which do not meet Secondary Drinking Water Standards.

Minor exemptions are fairly straightforward for aquifers, which have total dissolved solids (TDS) concentrations between 3,000 and 10,000 milligrams per liter (mg/L).

Consumptive Use Permitting

After construction of a viable ASR pilot project and conducting cycle testing, a water use permit for the established system and any planned expansion should be obtained from the District. This may be a modification of any existing permit for a particular utility, or a new permit for either an existing utility or for a new subregional entity. The main purpose for obtaining a water use permit for an ASR system is the same as that for obtaining any other water use permit in the State; namely it establishes the prior rights of the permittee to those applicants which may want to use an aquifer in the area in the future.

Well Construction

Regulations regarding construction and testing of ASR wells are contained in FAC Chapter 62, Section 528. In addition to obtaining an FDEP Class V well construction permit, a well construction permit must also be obtained from the agency that permits wells in a particular jurisdiction. In portions of Lee County, it is the Lee County Water Resources Department. In other parts of Lee County, it is a local government, such as the City of Cape Coral. If those entities are the permittee (i.e., the owner of the well), the District is the permitting agency. A similar situation applies to ASR wells constructed in Collier County.

Chapter 62-600, FAC – Wastewater Facilities

Chapter 62-600, FAC, discusses planning for wastewater facilities design and expansion and goes into some detail discussing minimum treatment standards, disinfection, pH, and other design and operational criteria. It also details the required treatment levels for all types of disposal, including discharge to surface waters, reuse and land application, and disposal by underground injection. It is expected that many of these rules will come into play during the design and construction of the RIDS infrastructure.

Chapter 62-604, FAC – Collection Systems and Transmission Facilities

This chapter imparts information on basic design principles that should be upheld, including details on fencing, siting, and special crossings. A requirement for uninterrupted service and a procedural outline for abnormal events are also included in this chapter.

Chapter 62-610, FAC, Part I – Reuse of Reclaimed Water and Land Application

Reuse is defined as the deliberate application of reclaimed water, in compliance with FDEP and water management district rules, for a beneficial purpose. The first part of this rule provides design, operation, and maintenance criteria for land application systems, surface water discharge projects involving reuse for ground water discharge, indirect potable use, or other beneficial purposes. For all new or expanded reuse or land application projects, a preliminary design report must be submitted to FDEP. Any exceptions to this are noted in this rule.

South Florida Water Management District (SFWMD) Regulations

Formed by Florida State Legislature in 1949, the Central and Southern Florida Flood Control District (FCD) resulted from the need to respond to drought and flood conditions in south Florida. The main responsibility of the FCD through 1972 was to act as local sponsor for the U.S. Army Corps of Engineers construction project.

In accordance with south Florida's changing demand for, and perception of, water resources management, the Florida State Legislature enacted the Water Resources Act in 1972. This act divided the state into five regional districts, naming one of them as the South Florida Water Management District (SFWMD). This act (Chapter 373, Florida Statutes) also greatly expanded the previous responsibilities of the FCD. Watersheds and other natural, hydrologic, and geographic features determine the districts' boundaries.

Today, the District operates and maintains the structures and conveyances built by the FCD. These consist of 1,800 miles of canals and levees, 25 major pumping stations, and about 200 large and 2,000 small water control structures.

The District spans 16 counties and includes vast areas of agricultural lands, water conservation areas, and areas of rapid urban growth and development.

Minimum Flows and Levels

To help determine the amount of water that is available for human use from a particular source, the District must, by act of the Florida Legislature, determine the water body's minimum flow and level (MFL). An MFL is the limit at which further withdrawals will cause significant harm to the water resources of the area and the related natural environment. Lakes and aquifers will have minimum levels set. Minimum flows will be set for rivers and streams. The District uses this information, as well as other information particular to a proposed withdrawal, when determining how much water an applicant may be allowed to withdraw from the water body.

Currently, the only surface water body that falls under the District's Priority List for establishing MFLs is the Caloosahatchee River and Estuary. In this case, a minimum mean monthly flow of 300 cubic feet per second (cfs) has been deemed necessary to maintain sufficient salinities downstream of the Franklin Locks (also known as S-79) in order to prevent a MFL exceedance. A MFL exceedance occurs during a 365-day period, when: (a) a 30-day average salinity concentration exceeds 10 parts per thousand, or (b) a single, daily average salinity exceeds a concentration of 20 parts per thousand. Exceedance of either parameter for two consecutive years is considered a violation.

All Minimum Aquifer Level (MAL) regulations in the Lower West Coast Region apply only to the Lower Tamiami, Sandstone, and mid-Hawthorn aquifers. Decisions on MALs in regard to the water table aquifer are pending. As all proposed ASR systems for the RIDS will be in the Floridan aquifer, these regulations do not apply to this project.

U.S. Army Corps of Engineers (ACOE)

The ACOE regulatory program includes the review of dredge and fill activities in waters of the United States, the construction in navigable waters and the disposal of dredge material in offshore locations. Section 404 of the Clean Water Act requires that permits be received for the deposition of

fill in waters or adjacent wetlands of the United States, the construction of revetments, groynes, levees, dams or weirs, and the placement of riprap. Section 10 of the Rivers and Harbors Act of 1899 requires that permits be obtained for activities that affect navigable waters. The ACOE also has Memorandums of Agreement (MOA) with other federal agencies such as the U.S. Fish and Wildlife Service (FWS) and the U.S. Department of Environmental Protection. These agreements allow for the agencies to provide input during the review process on issues such as federally listed wildlife species and wetland impacts associated with the projects under review. In determining whether to issue a permit, the ACOE must also comply with other requirements, including Section 7 of the Endangered Species Act of 1973 (50 CFR Part 402), the National Environmental Policy Act of 1969, the Coastal Zone Management Act, the Fish and Wildlife Coordination Act and other applicable federal laws.

Illustrated in Table 21 are the possible constraints by federal and state regulations broken down by RIDS alternative.

Table 21
Regulatory Constraints by Alternative

Surface Water	FDEP – Disinfection Byproducts (DBPs)
	SFWMD -- Water Use Permit (WUP)
	FDEP -- Infrastructure
	Filtration
	SFWMD -- Minimum Flows and Levels (MFLs)
Surface Water ASR	SFWMD -- WUP
	FDEP (infrastructure)
	DBPs
	Filtration
	FDEP – Primary/Secondard Drinking Water Standards
	FDEP – Underground Injection Control (UIC)
Reclaimed Water	FDEP (infrastructure)
Reclaimed Water ASR	FDEP (infrastructure)
	DBPs
	SFWMD -- WUP
	FDEP -- Primary/Secondary Drinking Water Standards
	FDEP – UIC

Collier County Regulations

Collier County is at the forefront of Florida municipalities in incorporating reclaimed infrastructure in new developments as well as retrofitting existing neighborhoods. Collier County is also among the first in the state to incorporate reclaimed water ASR into their capital improvements list. In addition, the Big Cypress Basin is an integral part of improving and maintaining the delicate water balance in this region of the state.

Collier County's Municipal Code, Section 3.8.2.3.25, states that a complete water distribution and transmission system to include provisions for separate potable and reuse water lines for all subdivisions and developments.

For other information on Collier County regulations, refer to the Collier County Municipal Code, Big Cypress Basin Board documents, SFWMD, and FDEP regulations.

Big Cypress Basin

Further definition of water management roles were established in 1976 as a result of a legislative amendment resulting in the establishment of two basin boards within the newly named South Florida Water Management District. The basins were named the Okeechobee Basin and the Big Cypress Basin.

The Big Cypress Basin (BCB) was officially created on January 1, 1977. The Big Cypress Basin Board presently has responsibility for operation, maintenance, and providing planning and capital improvements to 163 miles of primary canals and 40 water control structures. The BCB encompasses the portion of the RIDS that is located in Collier County.

BCB has the following programs:

Water Management Planning

The Basin is responsible for preparing engineering plans for the development of water resources within the basin.

Restoration Projects

The Basin is currently working on three major restoration projects. The Southern Golden Gate Estates Hydrologic Restoration is slated for funding under the CERP. The Lake Trafford and Tamiami Trail Flow Enhancement projects are being sponsored by a cooperative agreement with the ACOE under the funding initiative of the Water Resources Development Act of 1996.

Hydromonitoring

The Basin maintains an extensive monitoring network of rainfall, evaporation, surface and ground water levels, streamflow, and water quality.

Construction

The Basin's construction program facilitates and enhances the water resources within the region. Construction projects include retrofitting existing structures as well as new construction.

Operation and Maintenance

Maintenance work in the canals, involve shoal and debris removal, control of aquatic and terrestrial vegetation. Operation and maintenance of water control structures involves routine maintenance and timely operation of structures. Administration of canal right-of-way permits is coordinated under this program.

Lee County Regulations

Lee County does not have a basin board; therefore the majority of water rules and regulations are determined by the District, FDEP, or federal rules. However, Lee County is proactive in that both existing and new developments must use reclaimed water for irrigation over potable wherever feasible and within the utility service area.

Lee County Municipal Code, Sec. 10-354 -Reuse Water System

This portion of the Municipal Code states that, wherever feasible, the irrigation of grassed or landscaped areas must be provided for through the use of a second water distribution system supplying treated wastewater effluent or reuse water. All proposed developments should be designed to maximize the use of reclaimed water whether located in the utility service area or from an on-site wastewater treatment facility.

For other information on Lee County regulations, refer to the Lee County Municipal Code, SFWMD, and FDEP regulations.

ENVIRONMENTAL CONCERNS

Southwest Florida is experiencing rapid growth with an increase in population and urban development. This has led to concerns over the potential impacts of the growth on the environmental resources of the region. The study area contains a wide range of native vegetation communities, ranging from mangrove forests along the coast, to scrub oak communities along the ridges, and to cypress forests and mixed hardwood wetland forests in the interior of the study area. A vegetation map indicating the wide range of vegetation communities present in the study area is included as Figure 35. Southwest Florida also has an array of listed species that occupy habitat in the study area. These species include such widespread species as the Florida Panther (*Puma concolor coryi*) to species with very specific habitat requirements, such as the Red-cockaded woodpecker (*Picoides borealis*). A table indicating the potential listed species present in the study area is included as Table 22.

Table 22
Listed Faunal Species Occurring In Lee & Collier Counties, Florida (USFWS & FFWCC, 1998)

Scientific Name	Common Name	Federal Status	State Status
AMPHIBIANS			
Rana capito	Gopher frog		SSC
Reptiles			
Alligator mississippiensis	American alligator	T (S/A)	SSC
Caretta caretta	Loggerhead sea turtle	T	T
Chelonia mydas	Green sea turtle	E	E
Crocodylus acutus	American crocodile	E	E
Dermochelys coriacea	Leatherback sea turtle	E	E
Drymarchon corais couperi	Eastern indigo snake	T	T
Eretmochelys imbricata	Hawksbill sea turtle	E	E
Gopherus polyphemus	Gopher tortoise		SSC
Lepidochelys kempii	Kemp's ridley sea turtle	E	E
Pituophis melanoleucus mugitus	Florida pine snake		SSC
BIRDS			
Ajaia ajaja	Roseate spoonbill		SSC
Aphelocoma coerulescens	Florida scrub jay	T	T
Aramus guarauna	Limpkin		SSC
Caracara plancus	Audubon's crested caracara	T	T
Charadrius alexandrinus tenuirostris	Southeastern snowy plover		T
Charadrius melodus	Piping plover	T	T
Egretta caerulea	Little blue heron		SSC
Egretta thula	Snowy egret		SSC
Egretta tricolor	Tricolored heron		SSC
Eudocimus albus	White ibis		SSC
Falco peregrinus tundrius	Arctic peregrine falcon		E

Table 22
Listed Faunal Species Occurring In Lee & Collier Counties, Florida (USFWS & FFWCC, 1998)

Scientific Name	Common Name	Federal Status	State Status
Falco sparverius paulus	Southeastern American kestrel		T
Grus canadensis pratensis	Florida sandhill crane		T
Haematopus palliates	American oystercatcher		SSC
Haliaeetus leucocephalus	Bald eagle	T	T
Mycteria Americana	Wood stork	E	E
Pelecanus occidentalis	Brown pelican		SSC
Picoides (= Dendrocopos) borealis	Red cockaded woodpecker	E	T
Rhyncops niger	Black skimmer		SSC
Rostrhamus sociabilis plumbeus	Everglades snail kite	E	E
Speotyto cunicularia floridana	Florida burrowing owl		SSC
Sterna antilarum	Least tern		T
MAMMALS			
Balaena glacialis	Right whale	E	E
Balaenoptera borealis	Sei whale	E	E
Balaenoptera physalus	Finback whale	E	E
Blanna brevicauda shermanhi	Sherman's short tailed shrew		SSC
Felis concolor coryi	Florida panther	E	E
Feils concolor	Mountain lion	T (S/A)	E
Megapteranovaeangliae	Humpback whale	E	E
Mustela vison evergladensis	Everglades mink		T
Oryzomys palustris sanibelli	Sanibel Island rice rat		SSC
Physeter catodon	Sperm whale	E	E
Podomys floridanus	Florida mouse		SSC
Sciurus niger avicennia	Big Cypress fox squirrel		T
Trichechus manatus	West Indian manatee	E, CH	E
Ursus americanus floridanus	Florida black bear	T	T

E = Endangered

T = Threatened

SSC = Species of Special Concern

T(S/A) = Threatened Due to Similarity of appearance

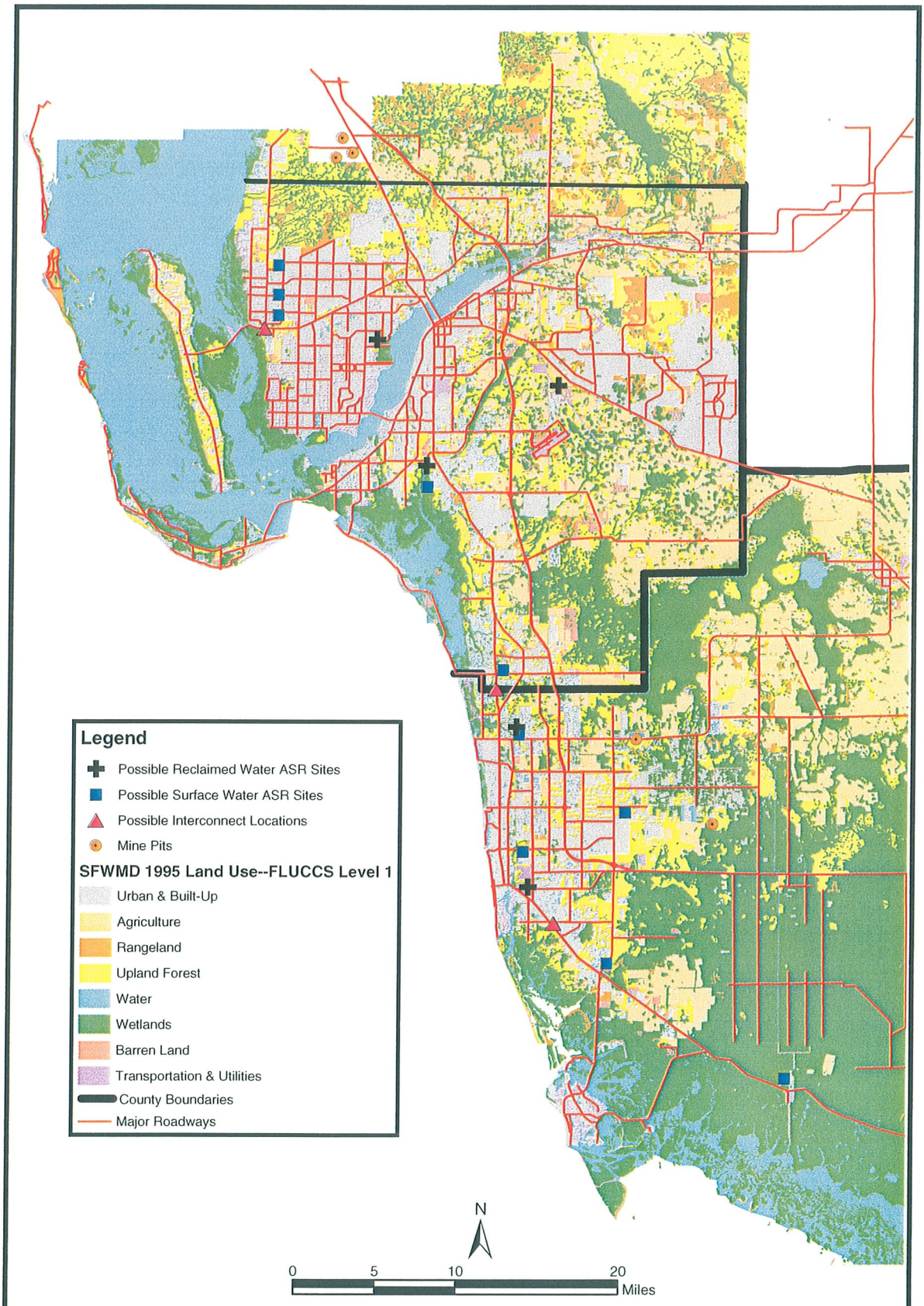
CH = Critical Habitat has been designated

During the site-specific design of the proposed alternatives, the direct and indirect wetland impacts associated with the alternatives should be assessed. Direct impacts could include effects on wetlands during the construction of the facilities or during the construction of the access to the site. Indirect impacts could include the potential drawdown of wetlands located adjacent or in proximity to the surface water withdrawal locations. Wherever possible, the design should be modified to minimize these potential wetland impacts. Mitigation efforts must be provided for all unavoidable wetland impacts. This process typically includes the enhancement or restoration of impacted wetlands.

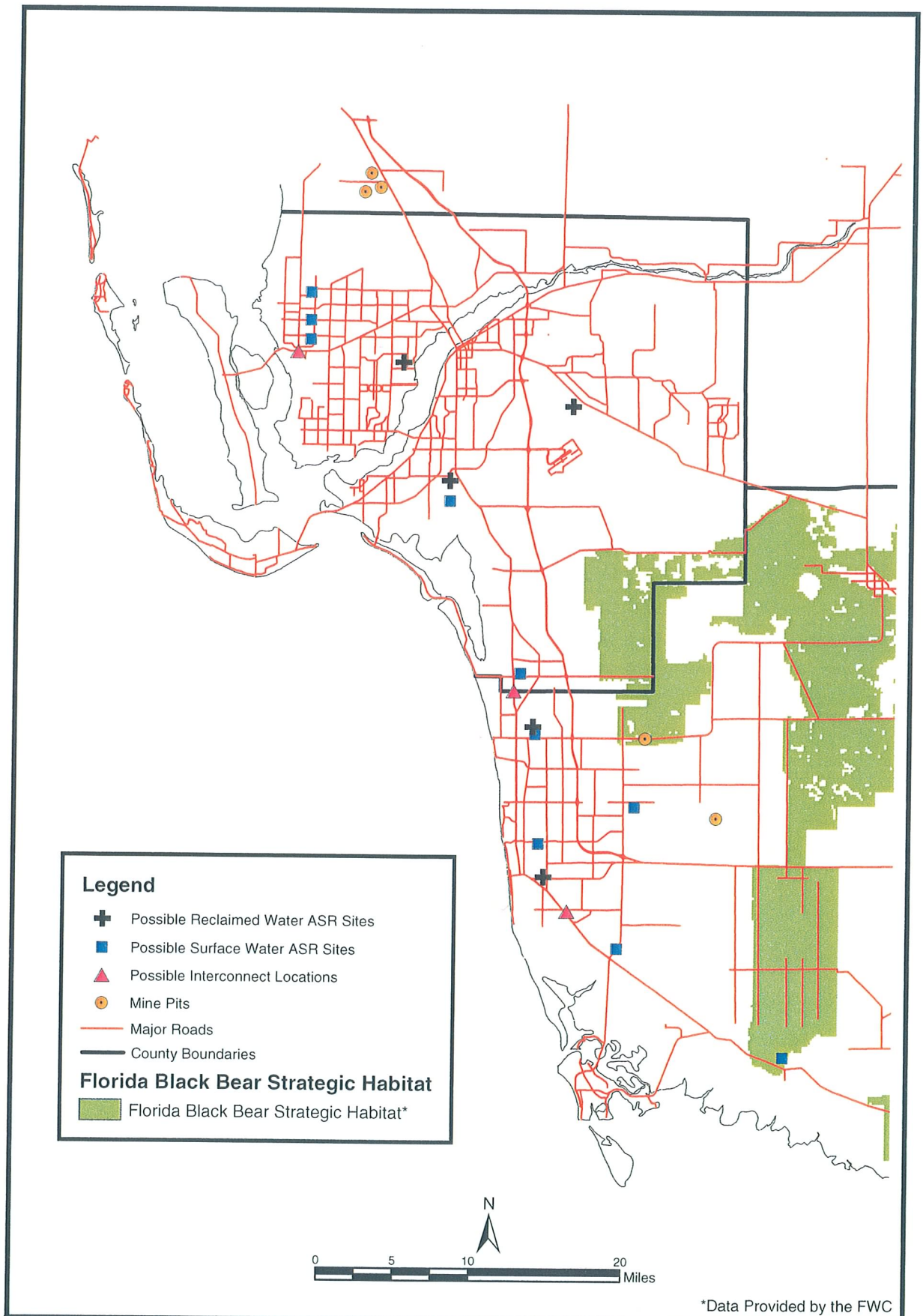
Mitigation can then be provided through participation in a permitted mitigation bank or by having the applicants undertake the mitigation work themselves.

The potential impacts to the listed species must be assessed during the site-specific design process. Included as Figures 36-39 are maps that show the locations of the proposed facilities in relationship to Florida black bear strategic habitat, Florida panther strategic habitat, wood stork foraging habitat, and focal species hot spots. Direct impacts such as negative effects on nesting habitat, as well as indirect impacts such as effects on foraging habitat, should also be addressed on a site-specific basis. Where possible, the proposed facilities should be located in already disturbed habitat to minimize impacts to listed species. Another indirect impact that has received much discussion in recent years is the alteration of discharges to estuaries. During design, the effect on the surface water withdrawals on the downstream receiving waters will need to be reviewed for potential alterations to the timing and quantity of discharges to the estuaries.

Attached as Figure 40, is a map that shows the public lands within the study area. A majority of the public lands are lands that are set aside for conservation purposes. Any proposed facilities within or adjacent to the public lands should be reviewed for potential impacts to these conservation lands. It is noted that the Faka Union Canal possible surface water ASR site and the Golden Gate mine site appear to be located within Conservation and Recreation Lands (CARL) in Collier County. The Fiesta Village/Fort Myers Beach GES possible reclaimed water ASR site and the Ten Mile Canal possible surface water ASR site appear to be located within boundaries of CARL lands in Lee County.

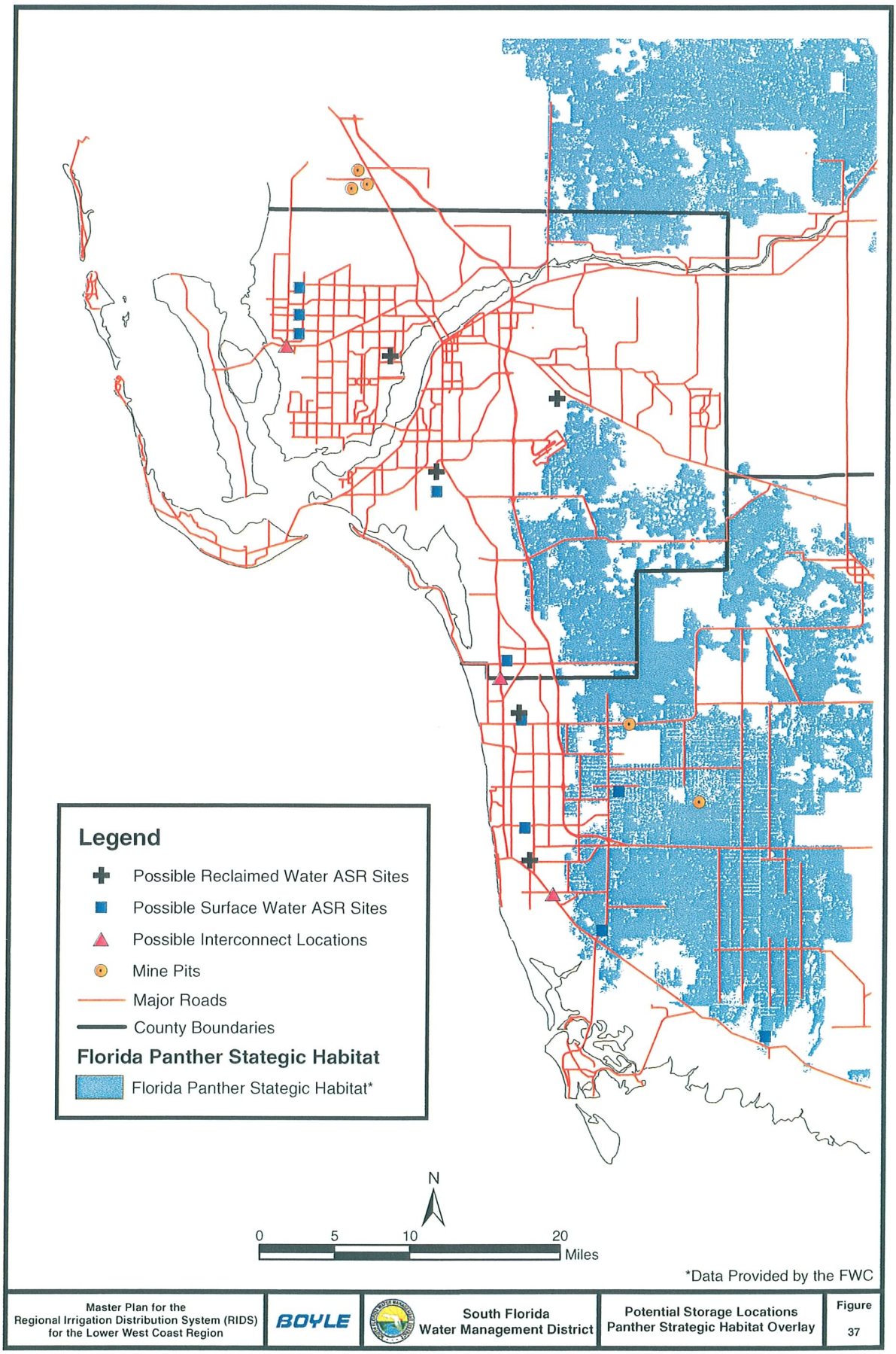


Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Potential Storage Locations FLUCCS Mapping Overlay	Figure 35

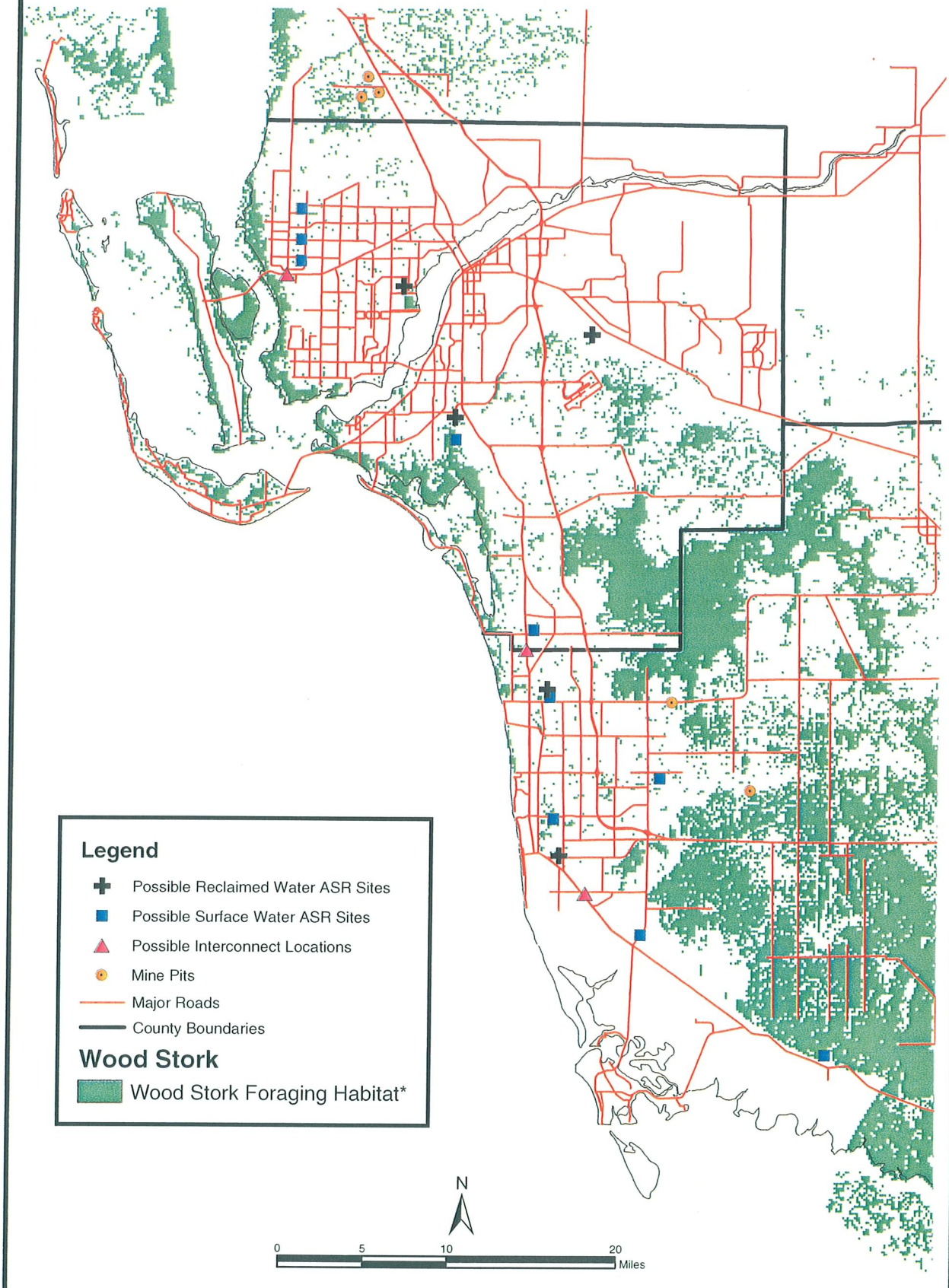


*Data Provided by the FWC

Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Potential Storage Locations Florida Black Bear Strategic Habitat Overlay	Figure 36

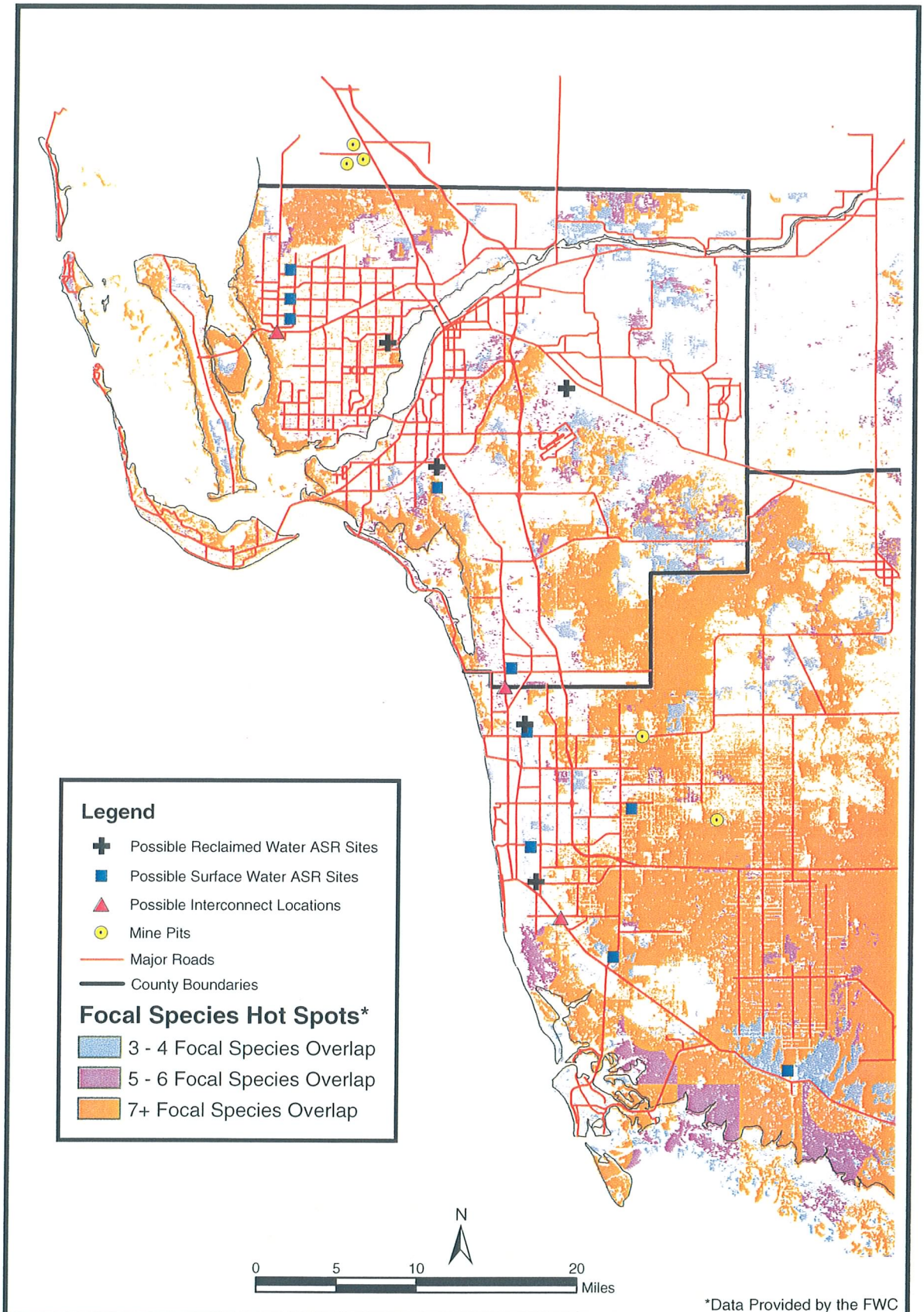


Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Potential Storage Locations Panther Strategic Habitat Overlay	Figure 37

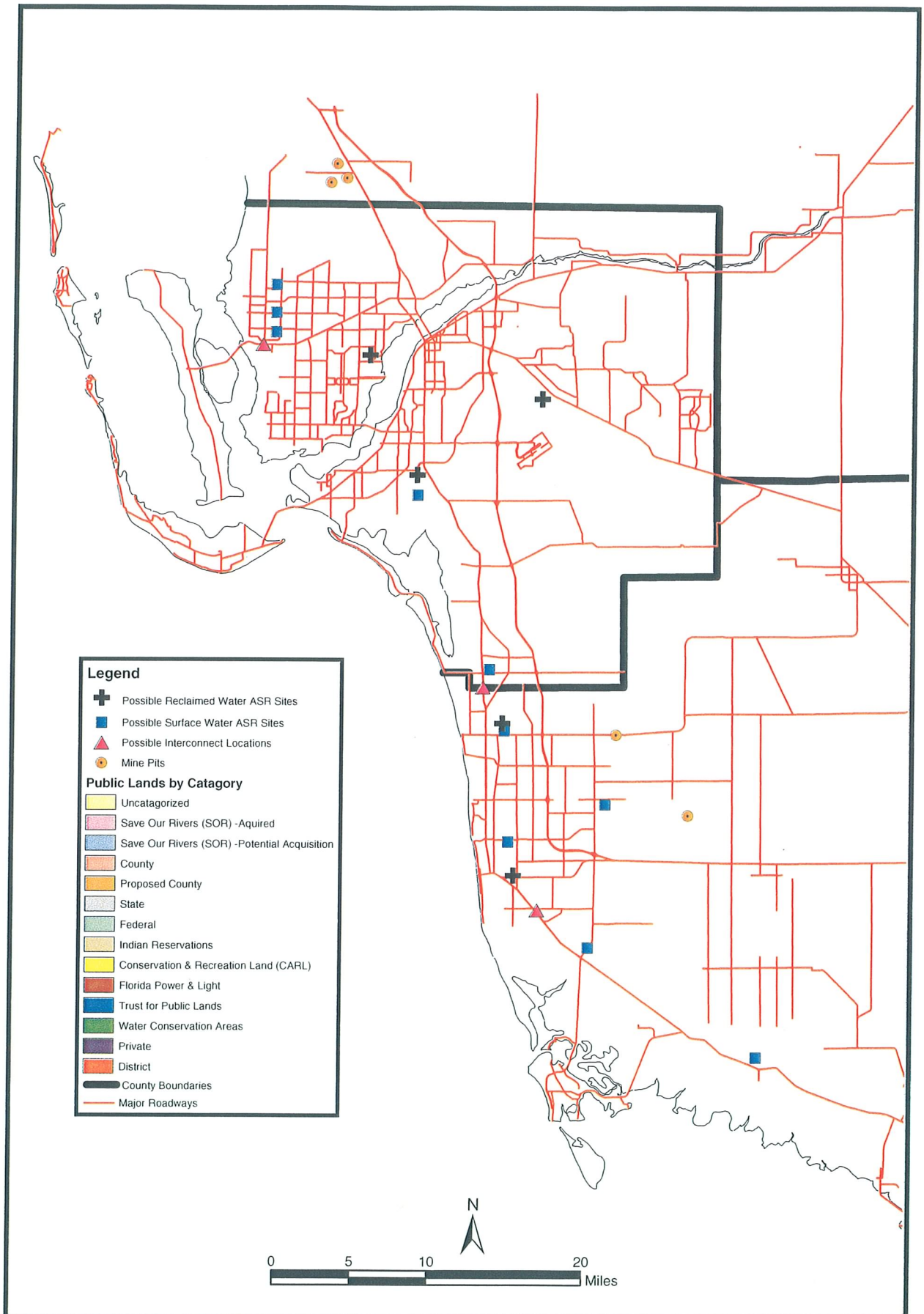


*Data Provided by the FWC

Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Potential Storage Locations Wood Stork Foraging Habitat Overlay	Figure 38



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Potential Storage Locations Focal Species Hot Spots	Figure 39



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	Potential Storage Locations Public Lands Overlay	Figure 40

BENEFITS AND INCENTIVES

The benefits of the RIDS program are very positive in terms of additional water sources in a high growth area such as the lower west coast of Florida. Overall, the RIDS optimizes existing reclaimed water supplies, maximizes surface water use, diversifies supply sources, reduces water shortage declarations, offsets potable water usage, reduces disposal volumes, and offsets groundwater withdrawals. Along with these obvious benefits, the following table (Table 23) presents incentives for the RIDS by subregion:

Table 23 Benefits and Incentives by Subregion
Subregion 1 -- Cape Coral, Waterway Estates, and North Ft. Myers
1. Meet increasing demands
2. Will allow water to be shared between utilities for beneficial reuse
3. Promote reduction of on-site septic systems, increasing reclaimed water supply
4. Allow growth to continue in the region by providing a supplemental supply of irrigation water
5. Reduce reliance on surface water discharge
6. Will allow expansion of reclaimed water systems and infrastructure
7. The region will be able to utilize or store close to 100% of reclaimed water on an annual basis
8. Rather than disposing of it in a deep injection well, beneficially reuse North Ft. Myers' excess reclaimed water in Cape Coral
9. Reduce discharges to the Caloosahatchee River
Subregion 2 -- Ft. Myers Central, Ft. Myers South, Gateway, and Lehigh Acres
1. Meet increasing demands
2. Will allow water to be shared between utilities for beneficial reuse
3. Promote reduction of on-site septic systems, increasing reclaimed water supply
4. Allow growth to continue in the region by providing a supplemental supply of irrigation water
5. Reduce reliance on surface water discharge
6. Will allow expansion of reclaimed water systems and infrastructure
7. The region will be able to utilize or store close to 100% of reclaimed water on an annual basis
8. Reduce disposal of effluent to the Caloosahatchee River at the Ft. Myers South and Central WWTPs
9. Interconnect with Gateway will allow effluent from Lehigh to be beneficially reused
Subregion 3 -- GES, Fiesta Village, and Ft. Myers Beach
1. Meet increasing demands
2. Will allow water to be shared between utilities for beneficial reuse
3. Promote reduction of on-site septic systems, increasing reclaimed water supply
4. Allow growth to continue in the region by providing a supplemental supply of irrigation water
5. Reduce reliance on surface water discharge
6. The region will be able to utilize or store close to 100% of reclaimed water on an annual basis
7. Reduce disposal of effluent from the Ft. Myers Beach WWTP to the deep well injection system
8. Irrigation water would be conveyed to high growth areas near I-75

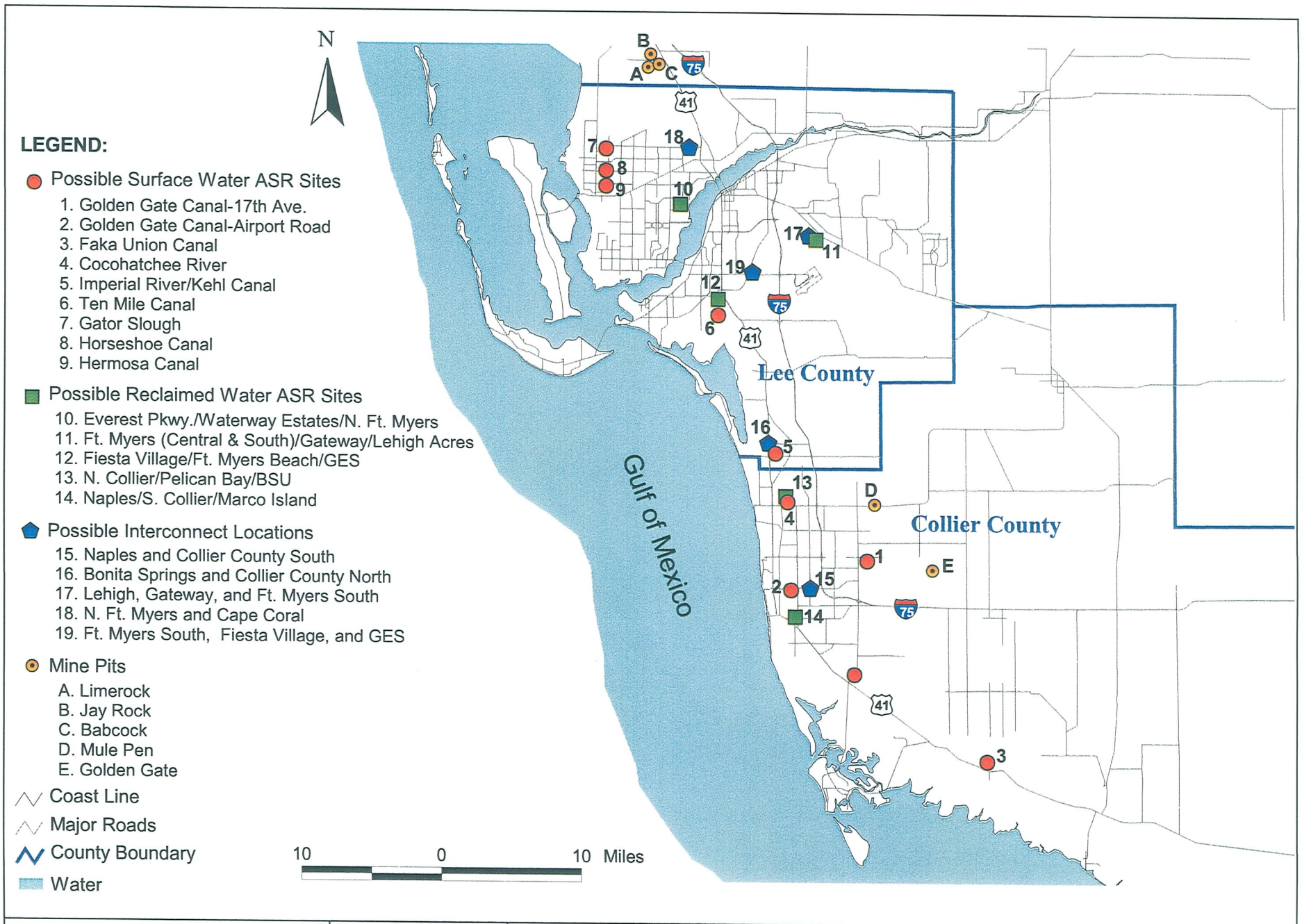
Table 23 Benefits and Incentives by Subregion
Subregion 4 -- North Collier, Pelican Bay, and Bonita Springs
1. Meet increasing demands
2. Will allow water to be shared between utilities for beneficial reuse
3. Promote reduction of on-site septic systems, increasing reclaimed water supply
4. Allow growth to continue in the region by providing a supplemental supply of irrigation water
5. Reduce reliance on surface water discharge
6. Will allow expansion of reclaimed water systems and infrastructure
7. The region will be able to utilize or store close to 100% of reclaimed water on an annual basis
Subregion 5 -- Naples, South Collier, and Marco Island
1. Meet increasing demands
2. Will allow water to be shared between utilities for beneficial reuse
3. Promote reduction of on-site septic systems, increasing reclaimed water supply
4. Allow growth to continue in the region by providing a supplemental supply of irrigation water
5. Reduce reliance on surface water discharge
6. Will allow expansion of reclaimed water systems and infrastructure
7. The region will be able to utilize or store close to 100% of reclaimed water on an annual basis
8. Interconnect with Collier County will allow Naples to send additional reclaimed water for beneficial reuse
9. Reduce disposal of effluent discharge to the Gordon River

Figure 41 illustrates the RIDS alternative options for the lower west coast study area.

Table 24
Subregional Alternative Summary

Subregion	Alternatives	Benefit (MGD)	Capital Cost ($)	Unit Cost ($ / 1,000 gal)[1]	Unit Cost ($ / 1,000 gal) – No Grants
Cape Coral / Waterway Estates / North Fort Myers	• Gator Slough ASR – 9 Wells • Horseshoe Canal ASR – 4 Wells • Hermosa Canal ASR – 4 Wells • Reclaimed Water ASR – 3 Wells • Cape Coral / North Ft. Myers Interconnect • Limerock / Jay Rock / Babcock Mine Pits	7 3 3 2 - 3.4 Total - 18.4	9,840,000 5,240,000 5,240,000 3,710,000 530,000 1,760,000	0.48	0.87
Ft. Myers Central \ Ft. Myers South \ Gateway \ Lehigh Acres	• Reclaimed Water ASR – 12 Wells • Gateway \ Lehigh Interconnect	9 - Total - 9	12,010,000 3,360,000	0.57	1.03
Fiesta Village \ Ft. Myers Beach \ GES	• Ten Mile Canal ASR – 16 Wells • Reclaimed Water ASR – 7 Wells • GES Interconnect	12 5 - Total - 17	15,380,000 7,550,000 3,480,000	0.52	0.94
North Collier \ Pelican Bay \ Bonita Springs	• Cocohatchee Canal ASR – 7 Wells • Imperial River/Kehl Canal ASR – 20 Wells • Golden Gate Canal ASR – 27 Wells • Reclaimed Water ASR – 6 Wells • North Collier \ Bonita Springs Interconnect • Golden Gate Mine Pit	5 15 20 4 - 1.5 Total - 51.5	7,550,000 19,330,000 26,630,000 6,020,000 550,000 480,000	0.57	0.72
Naples \ South Colliers \ Marco Island	• Faka Union Canal ASR – 34 Wells • Golden Gate Canal ASR – 34 Wells • Reclaimed Water ASR – 10 Wells • Naples \ South Collier Interconnect	25 25 7.5 - Total – 72.1	40,410,000 28,530,000 10,630,000 268,000	0.56	0.67

[1] Unit costs assume grant funding assistance



Master Plan for the Regional Irrigation Distribution System (RIDS) for the Lower West Coast Region	BOYLE	South Florida Water Management District	RIDS ALTERNATIVE OPTIONS	Figure 41

IMPLEMENTATION STRATEGY

Implementation of the RIDS will require additional phases to plan, design, finance and construct the improvements. Assuming Phase 1 included the Master Plan, subsequent phases include the following:

- **Phase 2 Feasibility Study** – Further study of the preferred alternative from the Master Plan to determine pipeline routes, pipe and pump sizes, specific storage locations, materials, detailed costing, detailed scheduling and a focused funding strategy.
- **Phase 3 Engineering Design** – Includes design, permitting and bidding of projects.
- **Phase 4 Construction** – Construction and startup of projects.

Project phases will be implemented on a subregional basis as developed in the Phase 1 Master Plan.

ATTACHMENT A

FLOW DATA

Influent Wastewater Flows

Facility	Permitted Flow (MGD)	Monthly Flows (MGD)												Average (MGD)	Annual Total (MGY)
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec		
Collier Co.															
Collier Co. North[a]	9.5	9.56	10.01	10.38	9.10	7.66	7.09	6.94	7.81	8.62	8.43	9.06	8.94	8.63	3,150.86
Collier Co. South[a]	8	6.74	6.96	6.95	6.37	5.46	5.42	5.61	6.25	7.52	6.47	6.57	6.26	6.38	2,329.46
Golden Gate[b]	0.95	0.88	0.84	0.81	0.84	0.81	0.78	0.98	0.88	1.49	0.86	0.83	0.88	0.91	331.06
Marco Island Utilities[b]	3.5	2.52	3.15	3.38	2.66	2.96	3.14	2.90	3.18	1.86	2.13	2.10	2.05	2.67	974.22
Naples[b]	10	6.70	6.92	7.26	6.81	5.57	5.78	7.80	7.05	6.81	6.67	6.75	6.70	6.74	2,458.28
Subtotal		**26.41**	**27.87**	**28.78**	**25.77**	**22.47**	**22.21**	**24.24**	**25.17**	**26.31**	**24.56**	**25.32**	**24.82**	25.33	9,243.87
Lee Co.															
Bonita Springs[b]	4.25	2.87	2.90	3.10	2.80	2.29	2.14	2.47	2.44	3.09	2.80	2.90	3.00	2.73	997.64
Cape Coral Utilities[c, b]	8.5 + 6.6	9.06	8.69	9.04	8.79	8.50	9.69	10.60	10.59	11.58	9.54	8.98	8.57	9.47	3,456.25
Fiesta Village[d]	5	2.27	2.41	2.31	2.14	1.84	1.89	2.18	2.30	2.84	2.31	2.10	2.02	2.22	808.90
Forest Utility[b]	0.5	0.29	0.28	0.27	0.26	0.24	0.23	0.24	0.21	0.21	0.25	0.25	0.27	0.25	90.95
Ft. Myers Beach[d]	6	3.26	3.82	3.84	3.23	2.29	2.49	2.62	2.68	3.15	2.74	3.12	2.93	3.01	1,099.78
Ft. Myers Central[e]	11	4.44	4.87	5.14	5.24	4.94	5.46	7.60	8.95	12.29	7.11	5.26	4.78	6.34	2,314.10
Ft. Myers South[e]	12	5.51	5.48	5.83	5.74	4.92	5.36	7.84	9.63	11.50	7.02	5.78	5.52	6.68	2,437.29
Gateway[d]	0.5	0.28	0.27	0.28	0.26	0.27	0.28	0.28	0.33	0.32	0.32	0.33	0.31	0.29	107.19
Gulf Environmental Services[b]	0.218 + 0.75	1.39	1.57	1.56	1.42	1.24	1.18	1.29	1.33	1.56	1.14	1.25	1.27	1.35	492.17
Lehigh Acres[b]	2.1	0.88	0.82	0.78	0.80	0.60	0.77	1.14	1.73	2.44	2.05	1.18	1.23	1.20	438.37
North Ft. Myers[b]	2	1.42	1.35	1.30	1.36	2.62	1.16	1.98	1.93	1.96	1.76	1.32	1.34	1.62	593.06
Pine Island[g]	0.5	0.10	0.01	0.12	0.10	0.10	0.11	0.16	0.14	0.10	0.09	0.10	0.10	0.10	37.53
Sanibel[h]	1.6	0.83	0.93	1.02	0.98	0.67	0.87	1.04	0.93	0.88	0.76	0.81	0.78	0.87	319.31
Waterway Estates[d]	1.25	0.86	0.70	0.77	0.72	0.73	0.76	0.94	1.10	1.23	1.02	0.84	0.80	0.87	318.58
Subtotal		**33.46**	**34.09**	**35.36**	**33.85**	**31.24**	**32.39**	**40.36**	**44.27**	**53.14**	**38.91**	**34.21**	**32.92**	37.02	13,511.11
Total Monthly Flow (MGD)		**59.87**	**61.96**	**64.14**	**59.62**	**53.71**	**54.59**	**64.60**	**69.44**	**79.45**	**63.47**	**59.52**	**57.74**	**62.34**	**22,754.98**

a. This data displays 1999 flows from Oct.- Dec. and 2000 flows for Jan. - Sept.

b. This data was taken from Monthly Operating Reports submitted to the Dept. of Environmental Protection (Jan - Sept '01, Oct - Dec '00)

Influent Wastewater Flows															
		Monthly Flows (MGD)												Average	Annual Total
Facility	Permitted Flow (MGD)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)

c. Influent Cape Coral data combines the flow from Cape Coral Everest and Cape Coral Southwest WWTPs

d. 2000 data

e. This data displays 2000 data from Oct. - Dec. and 2001 flows for Jan. - Sept.

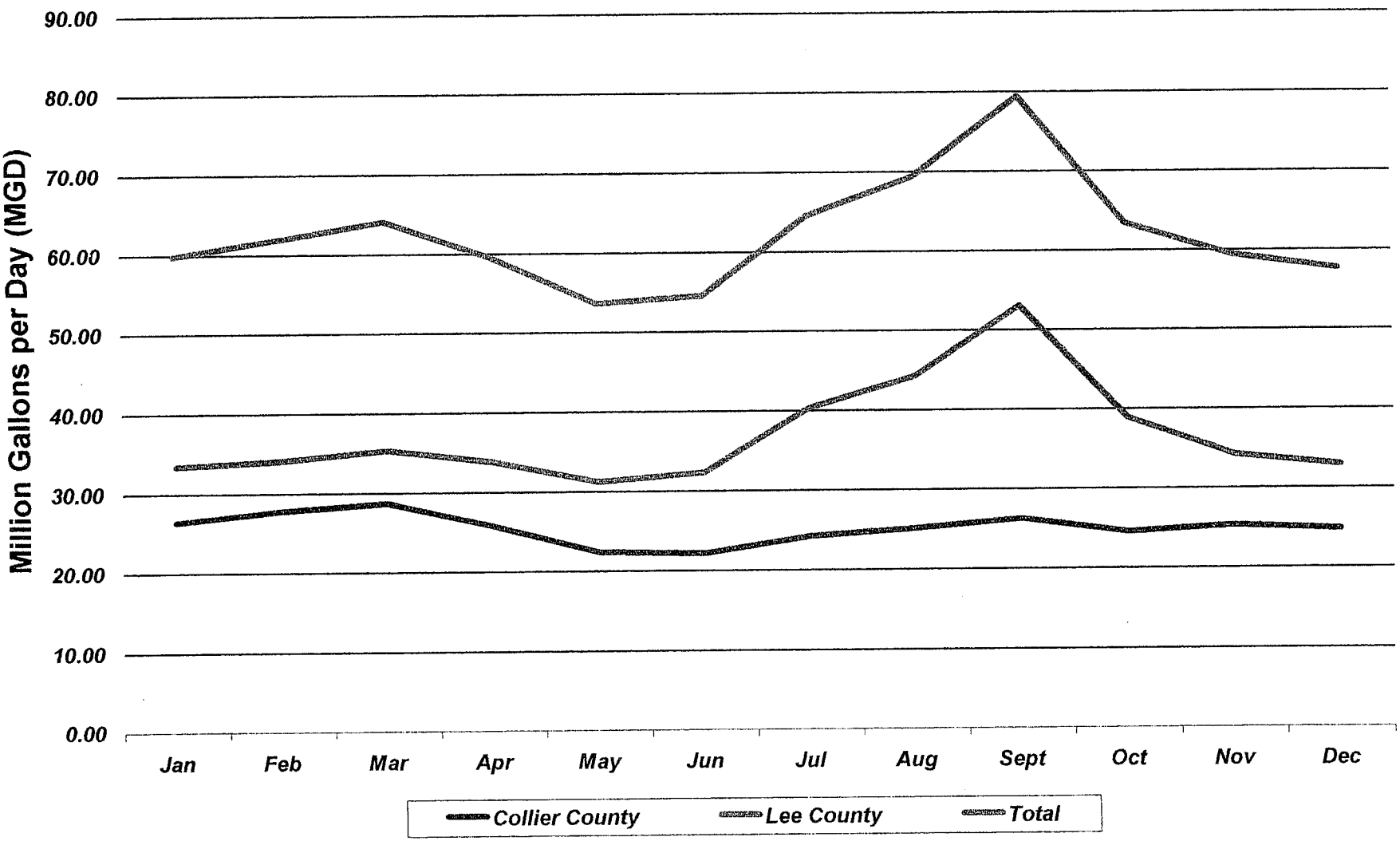
f. 2001 data (this plant just opened in Feb. of 2001)

g. 2001 data from Feb.- Sept. w/ supplemental data from Matlacha WWTP (now closed)

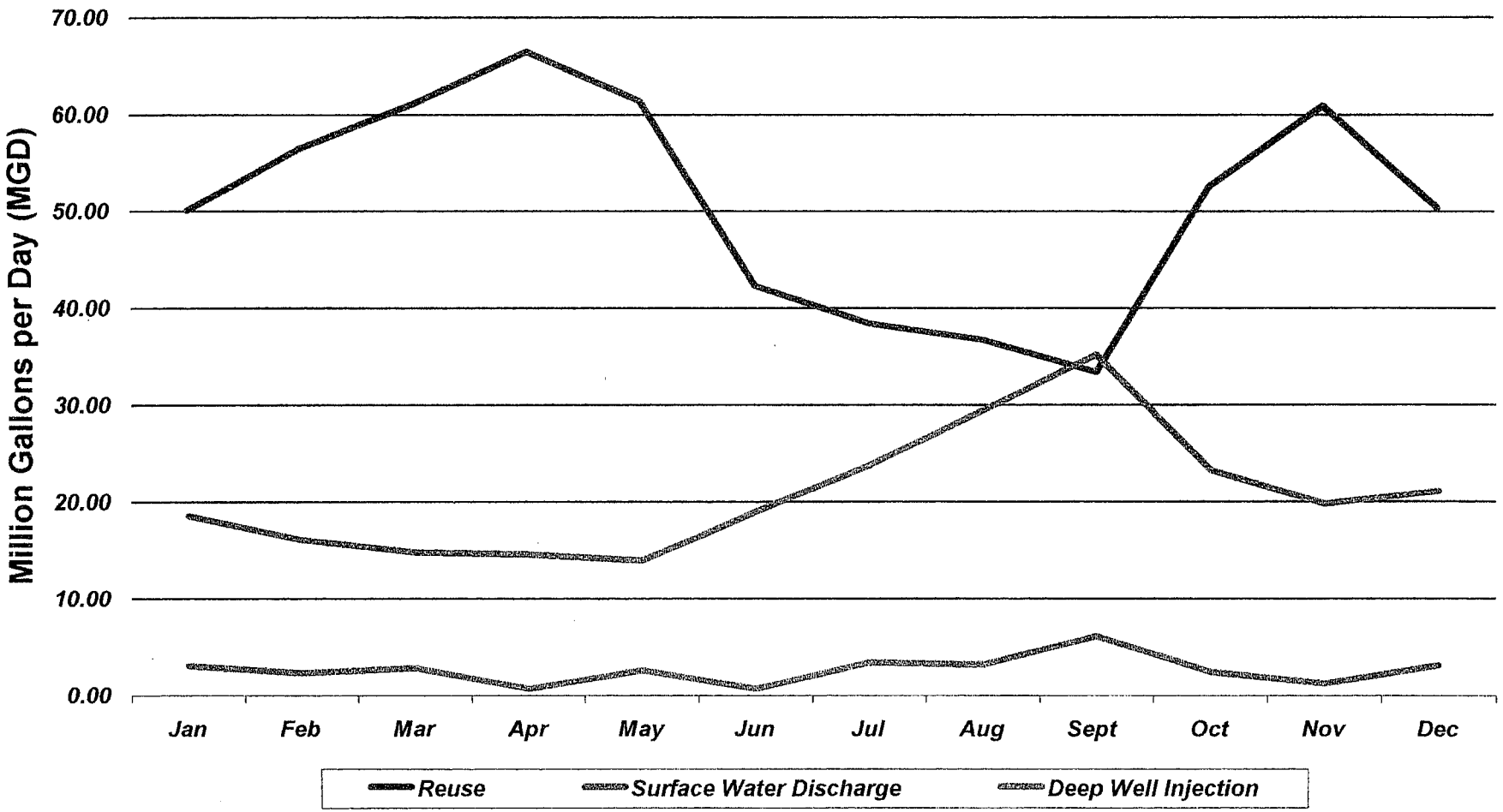
h. 1999 data

* The Highpoint WWTP was deleted from the study due to its small flows and lack of data

Monthly Flow Data for Lee and Collier Counties



Temporal Discharge by Method - Lee and Collier Counties



ATTACHMENT B

BLANEY-CRIDDLE METHODOLOGY AND REUSE FACTORS

ATTACHMENT B
BLANEY-CRIDDLE EXPANATION

The basic B-C formula states that the consumptive use (U) is equal to a seasonal consumptive use factor coefficient (k), times a monthly consumptive use factor (f), therefore U=k*f. F is a function of the mean monthly temperature in degrees Fahrenheit (t) times the monthly percent of daytime hours (p), divided by 100, expressed as f=t*p/100. K is a factor relating the plant water usage for a specific species. K factors are generated under experimental conditions where F and U are measured under tightly controlled conditions. This analysis uses a modified B-C method beginning with a modified (k) factor, explained in Appendix B.

Here, the coefficient (k) is equal to a climatic coefficient, which is related to the mean air temperature (kt), times a coefficient reflecting the growth stage of the crop (kc), (k=kt x kc). In order to approximate evapotranspiration, the following calculations must first be completed:

$f(m) = (t(m) \times p(m))/100,$
$kt(m) = (0.0173 \times t(m)) - 0.314,$
$kt\ f\ (m) = f(m) \times kt(m),$
$U(m) = kt\ f\ (m) \times kc\ (m),$ where,

m = month of year
f(m) = monthly evapotranspiration factor
r(m) = average monthly temperature, (provided)
p(m) = monthly percentage of annual daylight hours, (provided)
kt(m) = kt
U(m) = monthly evapotranspiration
kc(m) = monthly crop coefficient, (provided)

The effective rainfall for crop evapotranspiration is calculated as a function of the 1-in-10 year drought rainfall as:

$Rt(1) = (0.70917 \times (Rt(m)^{(0.82416)}) - 0.11556,$
$U1(m) = 10^{(0.01226 \times U(m))}$
$F1 = 0.531747 + (0.295154 \times D) - (0.057697 \times D^2) + (0.003804 \times D^3)$
$Re(m) = Rt1(m) \times U1(m) \times F1,$ where

Rt1(m) = monthly effective rainfall factor considering 1-in-10 monthly rainfall
Rt(m) = 1-in-10 monthly rainfall, (provided)
U1(m) = monthly effective rainfall factor considering monthly evapotranspiration
F1 = soil factor
D = net depth of application
Re(m) = monthly effective rainfall

After the monthly evapotranspiration, U(m), and the monthly 1-in-10 effective rainfall, Re(m), have been determined, the monthly supplemental crop requirement, Sup(m), is calculated as:

Sup(m) = U(m) – Re (m) for each month of the year

Finally, the irrigation quantity needed to supply the supplemental crop requirement Sup(m) is determined by:

Q(m) = Sup(m) x Ka x A, where

Ka = allocation coefficient multiplier for the irrigation system specified
A = irrigated acreage for the crop

Demand Analysis - Future Collier County North

FY 2000 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
7.7	8.0	8.5	7.2	6.0	5.5	5.8	5.7	5.3	6.7	6.9	7.4	**6.7**	**2,454.6**

Usage Factors (applied to the annual average of Blaney-Criddle demand)											
1.14	1.19	1.26	1.07	0.89	0.82	0.86	0.85	0.79	1.00	1.03	1.10

Modified Blaney Criddle Model Annual Average Irrigation Demand (MGD)	**63.3**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
72.4	75.3	80.0	67.7	56.4	51.7	54.6	53.6	49.9	63.0	64.9	69.6	**63.3**	**23,091.2**

Demand Analysis - Future Collier County South

FY 2000 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
3.2	5.3	5.3	5.6	4.0	3.8	3.1	2.3	1.3	2.9	3.3	2.1	**3.5**	**1,283.9**

Usage Factors* (applied to the annual average of Blaney-Criddle demand)											
1.14	1.19	1.26	1.07	0.89	0.82	0.86	0.85	0.79	1.00	1.03	1.10

Modified Blaney Criddle Model Irrigation Demand (MGD)	**61.0**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
69.8	72.6	77.1	65.3	54.4	49.9	52.6	51.7	48.1	60.8	62.6	67.1	**61.0**	**22,261.9**

*Factors were taken from the Collier County North service area in order to display a more realistic distribution

Demand Analysis - Future Golden Gate

FY 00-01 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.9	0.8	0.8	0.8	0.8	0.8	1.0	0.9	1.5	0.9	0.8	0.9	**0.9**	**331.1**

Usage Factors (applied to the annual average of Blaney-Criddle demand)											
0.97	0.92	0.89	0.93	0.89	0.86	1.08	0.97	1.64	0.95	0.92	0.97

Modified Blaney Criddle Model Irrigation Demand (MGD)	**7.0**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
6.8	6.4	6.2	6.5	6.3	6.0	7.6	6.8	11.5	6.6	6.4	6.8	**7.0**	**2,551.9**

Demand Analysis - Future Marco Island

FY 00-01 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
1.2	1.5	1.5	1.8	1.5	1.2	0.4	0.7	0.3	1.1	1.5	1.3	**1.2**	**426.2**

Usage Factors* (applied to the annual average of Blaney-Criddle demand)											
1.14	1.19	1.26	1.07	0.89	0.82	0.86	0.85	0.79	1.00	1.03	1.10

Modified Blaney Criddle Model Irrigation Demand (MGD)	**7.1**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
8.2	8.5	9.0	7.6	6.4	5.8	6.2	6.1	5.6	7.1	7.3	7.9	**7.1**	**2,607.7**

*Factors were taken from the Collier County North service area in order to display a more realistic distribution

Demand Analysis - Future Naples

FY 00-01 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
6.2	6.2	6.1	6.1	6.0	6.0	6.1	6.1	6.1	6.2	6.1	6.1	**6.1**	**2,227.7**

Usage Factors* (applied to the annual average of Blaney-Criddle demand)											
1.14	1.19	1.26	1.07	0.89	0.82	0.86	0.85	0.79	1.00	1.03	1.10

Modified Blaney Criddle Model Irrigation Demand (MGD)	**15.1**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
17.3	18.0	19.1	16.2	13.5	12.3	13.0	12.8	11.9	15.0	15.5	16.6	**15.1**	**5,509.9**

*Factors were taken from the Collier County North service area in order to display a more realistic distribution

Demand Analysis - Future Bonita Springs

FY 2001 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
2.9	2.9	3.1	2.8	2.3	2.1	2.0	2.4	2.6	2.8	2.9	3.0	**2.6**	**966.6**

Usage Factors (applied to average of Blaney-Criddle demand)											
1.08	1.09	1.17	1.07	0.86	0.81	0.75	0.92	0.96	1.07	1.08	1.12

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**21.5**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
23.2	23.5	25.2	23.0	18.6	17.4	16.1	19.8	20.7	23.1	23.2	24.2	**21.5**	**7,846.9**

*Demands provided by Resource Conservation Services

Demand Analysis - Future Cape Coral

FY 2000 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
20.5	24.1	26.5	32.4	32.5	15.9	12.9	11.3	9.3	22.8	30.3	21.7	**21.7**	**7,909.6**

Usage Factors (applied to average of Blaney-Criddle demand)											
0.94	1.11	1.22	1.49	1.50	0.73	0.60	0.52	0.43	1.05	1.40	1.00

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**56.1**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
53.0	62.4	68.4	83.7	84.1	41.1	33.4	29.3	24.0	58.9	78.3	56.1	**56.1**	**20,463.1**

Demand Analysis - Future Fiesta Village

FY 2000 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
1.0	1.3	1.1	1.2	1.2	0.6	0.4	0.4	0.2	0.9	1.3	1.0	**0.9**	**321.5**

Usage Factors* (applied to average of Blaney-Criddle demand)											
1.16	1.43	1.29	1.31	1.31	0.73	0.45	0.41	0.71	1.02	1.51	1.18

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	6.2

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
7.1	8.8	8.0	8.1	8.1	4.5	2.8	2.5	4.4	6.3	9.3	7.3	**6.4**	**2,346.6**

* The factor for the month of September was modified in order to display a more realistic distribution

Demand Analysis - Future Forest Utility

FY 00-01 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	**0.2**	**90.9**

Usage Factors (applied to average of Blaney-Criddle demand)											
1.16	1.12	1.08	1.03	0.95	0.94	0.96	0.83	0.86	1.01	1.00	1.08

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**0.9**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
1.0	1.0	1.0	0.9	0.8	0.8	0.8	0.7	0.8	0.9	0.9	1.0	**0.9**	**322.9**

Demand Analysis - Future Ft. Myers Beach

FY 2000 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
2.1	1.9	3.6	3.6	2.8	2.1	2.0	2.0	1.2	2.6	2.8	2.1	**2.4**	**874.8**

Usage Factors* (applied to average of Blaney-Criddle demand)											
0.87	0.77	1.50	1.51	1.18	0.87	0.85	0.84	0.96	1.08	1.19	0.86

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**18.8**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
16.3	14.5	28.2	28.3	22.2	16.3	15.9	15.7	18.1	20.4	22.3	16.1	**19.5**	**7,127.3**

*The factor for the month of September was modified in order to display a more realistic distribution

Demand Analysis - Future Ft. Myers Central

FY 00-01 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.6	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.6	**0.7**	**250.6**

Usage Factors (applied to average of Blaney-Criddle demand)											
0.93	0.96	1.09	1.17	1.14	0.98	0.99	0.98	0.92	0.99	0.95	0.92

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**11.6**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
10.8	11.2	12.7	13.5	13.2	11.3	11.5	11.3	10.6	11.5	11.0	10.6	**11.6**	**4,235.3**

Demand Analysis - Future Ft. Myers South

FY 00-01 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0.0**	**0.0**

Usage Factors (applied to average of Blaney-Criddle demand)											
0	0	0	0	0	0	0	0	0	0	0	0

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**0.0**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**

Demand Analysis - Future Gateway

FY 2000 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	**0.3**	**107.2**

Usage Factors (applied to average of Blaney-Criddle demand)											
0.95	0.91	0.96	0.89	0.93	0.96	0.94	1.12	1.09	1.09	1.11	1.05

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**4.5**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
4.2	4.0	4.3	4.0	4.2	4.3	4.2	5.0	4.9	4.9	5.0	4.7	**4.5**	**1,631.8**

Demand Analysis - Future Gulf Environmental Services

FY 00-01 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	**0.8**	**276.2**

Usage Factors* (applied to average of Blaney-Criddle demand)											
1.08	1.09	1.17	1.07	0.86	0.81	0.75	0.92	0.96	1.07	1.08	1.12

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	11.5

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
12.4	12.6	13.5	12.3	10.0	9.3	8.6	10.6	11.1	12.4	12.4	13.0	**11.5**	**4,202.7**

*Factors were taken from Bonita Springs service area to display a more realistic distribution

Demand Analysis - Future Lehigh Acres

FY 00-01 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.9	0.8	0.8	0.8	0.6	0.8	1.1	1.7	2.4	2.0	1.2	1.2	**1.2**	**438.4**

Usage Factors* (applied to average of Blaney-Criddle demand)											
0.87	0.77	1.50	1.51	1.18	0.87	0.85	0.84	0.96	1.08	1.19	0.86

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**31.9**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
27.8	24.7	47.9	48.1	37.8	27.8	27.1	26.8	30.7	34.6	38.0	27.4	**33.2**	**12,128.1**

*Factors were taken from Ft. Myers Beach service area to display a more realistic distribution

Demand Analysis - Future North Ft. Myers

FY 00-01 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.8	0.8	0.6	1.1	0.9	0.7	0.6	0.3	0.5	0.8	0.8	0.8	**0.7**	**262.5**

Usage Factors (applied to average of Blaney-Criddle demand)											
1.10	1.08	0.87	1.48	1.23	1.00	0.82	0.46	0.65	1.07	1.10	1.13

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**17.6**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
19.4	19.0	15.4	26.1	21.8	17.7	14.5	8.2	11.4	18.9	19.3	20.0	**17.6**	**6,435.6**

Demand Analysis - Future Pine Island

FY 2001 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	**0.1**	**36.5**

Usage Factors (applied to average of Blaney-Criddle demand)											
1	1	1	1	1	1	1	1	1	1	1	1

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**5.4**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	**5.4**	**1,982.0**

Demand Analysis - Future Sanibel

FY 1999 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.8	0.9	1.0	0.9	0.7	0.8	1.0	0.8	0.8	0.7	1.0	0.7	**0.8**	**304.8**

Usage Factors (applied to average of Blaney-Criddle demand)											
0.98	1.05	1.19	1.10	0.79	0.91	1.22	0.96	0.91	0.85	1.19	0.84

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**3.5**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
3.4	3.7	4.1	3.8	2.7	3.2	4.2	3.3	3.2	3.0	4.1	2.9	**3.5**	**1,267.1**

Demand Analysis - Future Waterway Estates

FY 2000 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.03	0.15	0.03	0.03	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	**0.0**	**9.2**

Usage Factors (applied to average of Blaney-Criddle demand)											
0.99	5.82	1.27	1.15	1.15	1.50	0.12	0.00	0.00	0.00	0.00	0.00

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**2.8**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
2.7	16.1	3.5	3.2	3.2	4.2	0.3	0.0	0.0	0.0	0.0	0.0	**2.8**	**1,010.9**

Demand Analysis - Future Waterway Estates

FY 2000 Actual Reclaimed Water Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
0.03	0.15	0.03	0.03	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	**0.0**	**9.2**

Usage Factors (applied to average of Blaney-Criddle demand)											
0.99	5.82	1.27	1.15	1.15	1.50	0.12	0.00	0.00	0.00	0.00	0.00

Modified Blaney-Criddle Model Annual Average Irrigation Demand (MGD)	**2.8**

Alternative Method Irrigation Demand (MGD)												Annual Average	Annual Total
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	(MGD)	(MGY)
2.7	16.1	3.5	3.2	3.2	4.2	0.3	0.0	0.0	0.0	0.0	0.0	**2.8**	**1,010.9**

ATTACHMENT C

BLANEY-CRIDDLE MODEL OUTPUTS

Collier County N. & Pelican Bay - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	7797.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X 7797 Acres X 1.33 X 0.02715 MG/AC-IN = 11534.93 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 7797 Acres X 1.33 X 0.02715 MG/AC-IN = 1449.96 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Collier County South - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	9060.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X 9060 Acres X 1.33 X 0.02715 MG/AC-IN = 13403.42 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 9060 Acres X 1.33 X 0.02715 MG/AC-IN = 1684.83 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Golden Gate - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	1734.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X 1734 Acres X 1.33 X 0.02715 MG/AC-IN = 2565.29 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 1734 Acres X 1.33 X 0.02715 MG/AC-IN = 322.46 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Marco Island Utilities - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	1055.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X 1055 Acres X 1.33 X 0.02715 MG/AC-IN = 1560.77 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 1055 Acres X 1.33 X 0.02715 MG/AC-IN = 196.19 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Naples - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	3368.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X 3368 Acres X 1.33 X 0.02715 MG/AC-IN = 4982.64 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 3368 Acres X 1.33 X 0.02715 MG/AC-IN = 626.33 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Collier County N. & Pelican Bay - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	15690.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X15690 Acres X 1.33 X 0.02715 MG/AC-IN = 23211.88 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 15690 Acres X 1.33 X 0.02715 MG/AC-IN = 2917.77 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Collier County South - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	15126.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X15126 Acres X 1.33 X 0.02715 MG/AC-IN = 22377.50 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 15126 Acres X 1.33 X 0.02715 MG/AC-IN = 2812.89 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Golden Gate - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	1734.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X 1734 Acres X 1.33 X 0.02715 MG/AC-IN = 2565.29 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 1734 Acres X 1.33 X 0.02715 MG/AC-IN = 322.46 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Marco Island Utilities - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	1772.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X 1772 Acres X 1.33 X 0.02715 MG/AC-IN = 2621.51 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 1772 Acres X 1.33 X 0.02715 MG/AC-IN = 329.53 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Naples - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Naples
Irrigation System:	Sprinkler
Irrigated Acreage:	3744.00
Crop:	Turf Grass
Soil Type:	0.40
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.88	1.93	0.96	2.05	4.42	8.17	8.36	8.18	8.69	4.09	1.56	1.32	51.61
Evapotranspiration (inches)	1.93	2.21	3.76	5.09	6.66	7.44	7.88	7.51	6.47	5.00	3.22	2.26	59.43
Average Effective Rainfall (inches)	0.77	0.80	0.45	0.99	2.14	3.78	3.95	3.79	3.77	1.82	0.70	0.56	23.52
1-in-10 Effective Rainfall (inches)	0.62	0.67	-0.04	0.34	1.51	2.75	3.30	3.42	3.34	1.61	0.53	0.41	18.46
Average Irrigation (inches)	1.16	1.41	3.31	4.10	4.52	3.66	3.93	3.72	2.70	3.18	2.52	1.70	35.91
1-in-10 Irrigation (inches)	1.31	1.54	3.80	4.75	5.15	4.69	4.58	4.09	3.13	3.39	2.69	1.85	40.97

1-in-10 Annual Supplemental Crop Requirement = 40.97 inches

Annual Supplemental Crop Water Use:

40.97 inches X 3744 Acres X 1.33 X 0.02715 MG/AC-IN = 5538.90 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.15 inches

Maximum Monthly Supplemental Crop Water Use:

5.15 inches X 3744 Acres X 1.33 X 0.02715 MG/AC-IN = 696.25 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Bonita Springs - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	3565.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 3565 Acres X 1.33 X 0.02715 MG/AC-IN = 4844.12 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 3565 Acres X 1.33 X 0.02715 MG/AC-IN = 659.10 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Cape Coral Utilities - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	6729.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 6729 Acres X 1.33 X 0.02715 MG/AC-IN = 9143.37 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 6729 Acres X 1.33 X 0.02715 MG/AC-IN = 1244.06 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Fiesta Village - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	1937.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 1937 Acres X 1.33 X 0.02715 MG/AC-IN = 2632.00 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 1937 Acres X 1.33 X 0.02715 MG/AC-IN = 358.11 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Forest Utility - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	239.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 239 Acres X 1.33 X 0.02715 MG/AC-IN = 324.75 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 239 Acres X 1.33 X 0.02715 MG/AC-IN = 44.19 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Ft. Myers Beach - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	3748.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 3748 Acres X 1.33 X 0.02715 MG/AC-IN = 5092.78 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 3748 Acres X 1.33 X 0.02715 MG/AC-IN = 692.93 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Ft. Myers Central - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	2357.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 2357 Acres X 1.33 X 0.02715 MG/AC-IN = 3202.69 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 2357 Acres X 1.33 X 0.02715 MG/AC-IN = 435.76 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Ft. Myers South - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	4120.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 4120 Acres X 1.33 X 0.02715 MG/AC-IN = 5598.26 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 4120 Acres X 1.33 X 0.02715 MG/AC-IN = 761.71 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Gateway - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	418.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 418 Acres X 1.33 X 0.02715 MG/AC-IN = 567.98 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 418 Acres X 1.33 X 0.02715 MG/AC-IN = 77.28 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Gulf Environmental Services - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	1636.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 1636 Acres X 1.33 X 0.02715 MG/AC-IN = 2223.00 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 1636 Acres X 1.33 X 0.02715 MG/AC-IN = 302.46 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Lehigh Acres - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	3429.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 3429 Acres X 1.33 X 0.02715 MG/AC-IN = 4659.33 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 3429 Acres X 1.33 X 0.02715 MG/AC-IN = 633.96 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

North Ft. Myers - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	4354.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 4354 Acres X 1.33 X 0.02715 MG/AC-IN = 5916.22 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 4354 Acres X 1.33 X 0.02715 MG/AC-IN = 804.97 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Pine Island - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	674.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 674 Acres X 1.33 X 0.02715 MG/AC-IN = 915.83 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 674 Acres X 1.33 X 0.02715 MG/AC-IN = 124.61 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Sanibel - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	758.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 758 Acres X 1.33 X 0.02715 MG/AC-IN = 1029.97 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 758 Acres X 1.33 X 0.02715 MG/AC-IN = 140.14 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Waterway Estates - Current

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	686.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 686 Acres X 1.33 X 0.02715 MG/AC-IN = 932.14 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 686 Acres X 1.33 X 0.02715 MG/AC-IN = 126.83 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Bonita Springs - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	5808.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 5808 Acres X 1.33 X 0.02715 MG/AC-IN = 7891.91 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 5808 Acres X 1.33 X 0.02715 MG/AC-IN = 1073.79 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Cape Coral Utilities - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	15146.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X15146 Acres X 1.33 X 0.02715 MG/AC-IN = 20580.39 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 15146 Acres X 1.33 X 0.02715 MG/AC-IN = 2800.20 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Fiesta Village - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	3219.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 3219 Acres X 1.33 X 0.02715 MG/AC-IN = 4373.98 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 3219 Acres X 1.33 X 0.02715 MG/AC-IN = 595.13 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Forest Utility - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	239.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 239 Acres X 1.33 X 0.02715 MG/AC-IN = 324.75 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 239 Acres X 1.33 X 0.02715 MG/AC-IN = 44.19 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Ft. Myers Beach - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	5072.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 5072 Acres X 1.33 X 0.02715 MG/AC-IN = 6891.84 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 5072 Acres X 1.33 X 0.02715 MG/AC-IN = 937.71 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Ft. Myers Central - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	3135.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 3135 Acres X 1.33 X 0.02715 MG/AC-IN = 4259.84 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 3135 Acres X 1.33 X 0.02715 MG/AC-IN = 579.60 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Ft. Myers South - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	4992.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 4992 Acres X 1.33 X 0.02715 MG/AC-IN = 6783.13 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 4992 Acres X 1.33 X 0.02715 MG/AC-IN = 922.92 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Gateway - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	1208.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 1208 Acres X 1.33 X 0.02715 MG/AC-IN = 1641.43 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 1208 Acres X 1.33 X 0.02715 MG/AC-IN = 223.34 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Gulf Environmental Services - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	3111.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 3111 Acres X 1.33 X 0.02715 MG/AC-IN = 4227.23 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 3111 Acres X 1.33 X 0.02715 MG/AC-IN = 575.16 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Lehigh Acres - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	8630.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 8630 Acres X 1.33 X 0.02715 MG/AC-IN = 11726.45 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 8630 Acres X 1.33 X 0.02715 MG/AC-IN = 1595.52 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

North Ft. Myers - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	4763.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 4763 Acres X 1.33 X 0.02715 MG/AC-IN = 6471.97 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 4763 Acres X 1.33 X 0.02715 MG/AC-IN = 880.59 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Pine Island - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	1467.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 1467 Acres X 1.33 X 0.02715 MG/AC-IN = 1993.36 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 1467 Acres X 1.33 X 0.02715 MG/AC-IN = 271.22 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Sanibel - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	938.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 938 Acres X 1.33 X 0.02715 MG/AC-IN = 1274.55 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 938 Acres X 1.33 X 0.02715 MG/AC-IN = 173.42 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

Waterway Estates - Future

Calculations Of Irrigation Requirements (1-in-10)

Rainfall Station:	Ft. Myers
Irrigation System:	Sprinkler
Irrigated Acreage:	748.00
Crop:	Turf Grass
Soil Type:	0.80
Multiplier	1.33
Efficiency	0.75

Calculations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average Rainfall (inches)	1.90	2.00	1.50	1.90	4.10	9.40	8.70	8.60	8.40	3.50	1.50	1.50	53.00
Evapotranspiration (inches)	1.86	2.14	3.70	5.11	6.83	7.60	8.05	7.72	6.48	4.92	3.07	2.15	59.63
Average Effective Rainfall (inches)	0.88	0.94	0.79	1.06	2.31	4.91	4.71	4.58	4.19	1.81	0.76	0.72	27.66
1-in-10 Effective Rainfall (inches)	0.62	0.81	0.13	0.40	1.71	3.91	3.82	4.03	4.02	1.30	0.62	0.63	22.00
Average Irrigation (inches)	0.98	1.20	2.91	4.05	4.52	2.69	3.34	3.14	2.29	3.11	2.31	1.43	31.97
1-in-10 Irrigation (inches)	1.24	1.33	3.57	4.71	5.12	3.69	4.23	3.69	2.46	3.62	2.45	1.52	37.63

1-in-10 Annual Supplemental Crop Requirement = 37.63 inches

Annual Supplemental Crop Water Use:

37.63 inches X 748 Acres X 1.33 X 0.02715 MG/AC-IN = 1016.38 MG

1-in-10 Maximum Monthly Supplemental Crop Requirement = 5.12 inches

Maximum Monthly Supplemental Crop Water Use:

5.12 inches X 748 Acres X 1.33 X 0.02715 MG/AC-IN = 138.29 MG

Notes:
Evapotranspiration was calculated using a modified Blaney-Criddle method.
Average effective rainfall is the amount that is useful to crops in an average year.
2-in-10 drought rainfall is the rainfall minimum expected with a probability of 2 year in 10.
2-in-10 effective rainfall is the amount that is useful to crops in a 2-in-10 drought rainfall.
Average irrigation is the net amount that should be required for maximum yields during an average year.
2-in-10 irrigation is the net amount that should be required for maximum yields during a 2-in-10 drought year.

ATTACHMENT D

ALTERNATIVE SUPPLY AND DEMAND OPTIONS

Alternative Sources of Supply

	Monthly Flows (MGD)											
Collier County												
Total Surface Water	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Withdrawal	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
Reclaimed ASR	10.2	10.2	10.2	10.2	10.2	0.0	0.0	0.0	0.0	0.0	0.0	10.2
Surface Water ASR	82.0	82.0	82.0	82.0	82.0	0.0	0.0	0.0	0.0	0.0	0.0	82.0
Mine Pits	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Subotal	114.3	114.3	114.3	114.3	114.3	22.1	22.1	22.1	22.1	22.1	22.1	114.3
Lee County												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Reclaimed ASR	17.3	17.3	17.3	17.3	17.3	0.0	0.0	0.0	0.0	0.0	0.0	17.3
Surface Water ASR	41.0	41.0	41.0	41.0	41.0	0.0	0.0	0.0	0.0	0.0	0.0	41.0
Mine Pits	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Subotal	61.7	61.7	61.7	61.7	61.7	3.4	3.4	3.4	3.4	3.4	3.4	61.7
Combined												
Total Surface Water	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Withdrawal	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
Reclaimed ASR	27.5	27.5	27.5	27.5	27.5	0.0	0.0	0.0	0.0	0.0	0.0	27.5
Surface Water ASR	123.0	123.0	123.0	123.0	123.0	0.0	0.0	0.0	0.0	0.0	0.0	123.0
Mine Pits	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9

Total	***176.0***	***176.0***	***176.0***	***176.0***	***176.0***	***25.5***	***25.5***	***25.5***	***25.5***	***25.5***	***25.5***	***176.0***

Potential Reclaimed Water Users*												
County	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
Lee	41	41	41	41	41	41	41	41	41	41	41	41
Collier	16	16	16	16	16	16	16	16	16	16	16	16
Total	57	57	57	57	57	57	57	57	57	57	57	57
Total w/ Potential - Lee	72.0	75.8	79.9	85.9	84.1	66.1	63.1	62.1	59.9	75.8	83.4	73.6
Total w/ Potential - Collier	35.2	37.9	38.2	37.6	34.3	33.3	32.3	31.6	30.5	33.8	34.6	33.8
Total w/ Potential - Total	**107.2**	**113.6**	**118.1**	**123.5**	**118.4**	**99.3**	**95.4**	**93.7**	**90.4**	**109.7**	**117.9**	**107.4**

*Calculated from utility-provided master plans and reports.

ATTACHMENT E

SURFACE WATER STAGE AND FLOW DATA

SURFACE WATER BODY: ARIES CANAL
GAGE STATION LOCATION: SW 1/4 NE 1/4 SEC. 34 T 44 S R 23 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1989										6.75	0.79	0.99
1990	1.25	0.80	0.54	0.97	0.34	7.68	11.4	16.6	21.1	13.3	2.52	0.40
1991	18.2	7.79	4.47	3.51	7.27	16.5	45.2	37.7	43.9	33.2	5.85	1.90
1992	2.23	5.09	9.75	8.56	1.22	60.0	34.9	41.3	34.2	9.55	5.00	4.57
1993	7.04	8.33	10.4	5.76	1.22	9.42	40.7	26.4	17.9	25.3	5.57	1.12
1994	1.29	1.25	0.97	0.71	0.00	0.92	7.92	6.02	24.0	5.20	3.67	2.99
1995	5.45	3.32	1.64	2.83	4.35	19.1	42.6	36.9	74.6	31.0	7.29	2.20
1996	10.3	2.78	2.17	1.88	8.67	25.1	20.4	18.1	13.6	10.9	0.02	1.45
1997	1.55	1.28	0.23	4.06	2.61	3.60	15.9	23.7	18.8	10.5	5.48	20.6
1998	22.1	31.6	11.8	1.60	0.50	6.51	50.3	21.4	15.3	2.52	15.3	6.86
1999	22.3	5.16	0.75	0	0	39.9	127	41.8	71.8	31.9	3.95	2.47
2000	5.33	2.78	0.54	0	0	3.24	34.3	57.9	110			
MEAN	8.82	6.38	3.93	2.72	2.38	17.5	39.1	29.8	40.5	16.4	5.04	4.14

DRY SEASON: 4.73
WET SEASON: 31.4

SURFACE WATER BODY: CALOOSAHATCHEE RIVER
GAGE STATION LOCATION: NE 1/4 NE 1/4 SEC. 22 T 43 S R 26 E (According to the Long. and Lat.)
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1966					2241	4853	5636	6350	4371	2954	742	117
1967	121	198	88	10	10	1300	2145	1714	798	1411	109	10
1968	38	59	42	10	547	5622	7169	4631	1073	1346	904	479
1969	211	158	4558	2106	2634	5008	2145	4153	1465	6772	6869	4789
1970	7486	5245	8829	7970	1574	5371	5050	1857	624	459	98	10
1971	25	61	56	10	113	274	993	1084	2411	1234	357	86
1972	31	109	33	119	57	1458	546	228	370	85	369	195
1973	223	592	395	134	10	548	1645	2537	2603	762	29	104
1974	20	21	10	18	154	1940	7376	10750	5248	311	64	212
1975	25	10	201	175	318	855	1745	705	1917	942	62	21
1976	56	460	236	192	342	627	688	1637	1035	188	135	39
1977	527	133	92	135	782	773	767	1173	1550	105	90	747
1978	308	204	715	62	485	817	1855	4063	1758	643	235	455
1979	4088	4172	3033	84	915	192	363	340	4408	5937	1217	1171
1980	2506	4561	3106	3297	1700	613	529	1178	1823	177	248	46
1981	30	267	144	81	106	253	81	901	1238	4892	33	4
1982	3	28	67	194	686	6053	3510	3158	1992	4892	176	240
1983	2060	10080	10320	8198	2473	2923	1331	2455	2925	2657	741	831
1984	941	1889	5536	5830	1537	3336	6264	4079	1526	528	777	259
1985	323	48	294	458	480	983	1985	2376	3687	922	156	130
1986	343	84	1228	15	181	2917	2528	4209	2286	723	863	514
1987	1659	937	1921	1909	1012	600	1412	1229	1442	2792	4488	980
1988	576	1269	2223	804	136	362	1648	2895	1113	111	680	187
1989	199	351	531	722	46	700	1397	1491	1538	987	30	197
1990	68	479	6	396	91	439	1453	2567	799	663	26	10
1991	1010	185	57	371	1426	1732	3989	3114	1653	1287	233	89
1992	98	486	428	474	150	3657	3084	3676	2628	654	182	74
1993	2400	2891	1434	3268	178	946	763	1489	3778	2698	618	108
1994	626	855	394	447	207	1945	1549	1853	4869	4835	3910	5519
1995	5406	3819	2681	1274	124	1731	3394	8287	9357	10390	6785	2708
1996	2348	331	267	1017	696	4304	3813	1012	388	1037	24	272
1997	68	472	250	458	357	832	1401	2500	2009	884	394	
1998	5632	8296	10160		2095	477	821	3195	2759		2578	296
1999	665	98	7	780	301	3601	3185		3961	4853	4170	1779
2000	809	17	342	1351	2914	494	992	486	1816			
MEAN	1204	1437	1755	1284	774	1958	2379	2746	2378	2095	1129	687

DRY SEASON: 1190
WET SEASON: 2399

SURFACE WATER BODY: COCOHATCHEE CANAL
GAGE STATION LOCATION: SE 1/4 SW 1/4 SEC. 23 T 48 S R 25 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1968										27.1	35.6	8.80
1969	12.3	11.4	9.88	10.0	5.87	9.51	71.7	52.3	66.9	71.3	49.2	17.4
1970	10.4	6.81	67.7	24.3	4.11	17.5	19.3	42.1	75.3	17.4	3.74	2.57
1971	1.07	0.61	0.02	4.64	4.53	6.11	29.7	75.7	152	92.9	26.9	13.1
1972	9.92	11.6	8.76	7.07	12.2	41.2	38.9	34.2	73.5	41.4	15.7	9.92
1973	8.51	7.98	6.26	2.69	4.17	15.6	24.9	239	278	45.7	7.98	2.92
1974	1.60	4.17	1.67	0	0	20.3	183	175	137	20.2	2.95	2.30
1975	1.48	1.04	1.23	0.95	1.52	4.48	15.0	46.5	56.5	34.7	16.8	7.76
1976	5.58	4.80	4.17	2.77	5.08	28.3	38.8	26.0	34.3	18.5	4.80	1.36
1977	7.64	8.43	4.46	1.08	1.79	13.1	27.4	53.4	98.5	27.3	7.33	8.10
1978	5.01	7.69	11.7	7.04	6.36	10.1	51.3	149	63.8	9.43	2.42	2.42
1979	8.49	13.4	13.4	6.79	16.0	6.96	4.90	10.6	94.9	78.3	22.9	32.9
1980	31.9	30.7	18.7	8.64	8.21	7.74	14.9	42.4	106	50.9	16.6	13.4
1981	5.81	5.57	5.06	3.44	3.91	13.1	27.5	103	128	26.6	7.89	2.77
1982	2.00	1.67	1.55	1.09	1.94	80.9	71.3	137	154	6.14	4.83	3.77
1983	3.61	4.69	4.89	4.54	3.37	3.44	4.89	5.67	6.29	75.7	56.6	31.6
1984	22.7	13.1	30.0	18.0	10.2	36.3	133	53.6	73.5			
1994							107	170	191	87.7	43.8	53.2
1995	41.5	35.6	16.5	9.39	10.2	23.2	62.0	182	22.8	355	98.7	28.7
1996	26.3	11.4	14.5	11.5	3.02	30.1	20.2	50.3	51.8	85.5	8.47	1.46
1997	1.54	1.23	1.12	1.50	1.51	3.90	21.7	23.0	13.7	12.8	1.41	26.8
1998	16.2	46.8	44.9	8.51	0.01	2.13	10.7	24.8	62.8	23.6	57.5	17.3
1999	11.4	6.23	3.81	9.18	0.35	8.06	62.7	126	111	43.7	34.3	29.0
2000	29.6	29.9	29.1	29.0	29.1	29.1	28.0	29.9	36.0	30.7	28.4	29.4
2001	30.5	30.2	4.97	0.71	0	2.21	39.5	57.7	209			
MEAN	12.8	12.8	13.2	7.51	5.80	18.0	46.2	79.5	95.7	55.8	24.1	15.1

DRY SEASON: 11.2
WET SEASON: 69.3

SURFACE WATER BODY: COURTNEY CANAL
GAGE STATION LOCATION: SE 1/4 SW 1/4 SEC. 2 T 45 S R 23 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1986												0.27
1987	3.97	4.01	8.37	3.61	2.21	12.9	24.1	12.8	4.02	13.6	3.03	0
1988	0.01	0	0.90	0	0	0	0.68	17.20	6.36	0	0	0
1989	0	0	0	0	0	0.01	15.2	14.8	24.9	11.0	0	0
1990	0.29	0	0	0.03	0	12.3	23.0	20.3	6.87	1.88	0	0
1991	8.89	0.59	0.26	0	2.64	8.21	16.90	14.6	18.1	4.49	4.18	4.04
1992	3.85	4.14	4.33	4.32	4.02		4.71	4.61	4.57	4.38	4.29	4.29
1993	4.41	4.46	4.45	4.13	3.65	3.94	4.61	4.55	4.59	4.59		
1994	4.30	4.35	4.13	3.64	3.01	2.49			4.80	4.58	4.51	4.40
1995	4.67	4.62			4.37	5.01	5.15			28.7	2.62	0.45
1996	12.0	0	0	0	1.77	31.5	31.3	22.6	11.1	19.2	0	0
1997	0	0.02	0	1.40	0.54	7.43	30.20	50.9	19.4	9.82	8.08	34.2
1998	44.0	66.7	39.3	5.09	0.36	3.29	72.2	35.0	21.6	0.38	29.9	15.9
1999	14.5	5.62	0	0	0	59.7	17.2	0.60	29.1	16.4	0.61	0.80
2000	11.3	10.7	0.21	0.02	0	1.74	11.70	57.3	50.0			
MEAN	8.01	7.52	4.77	1.71	1.61	11.4	19.8	21.3	15.8	9.15	4.77	5.34

DRY SEASON: 4.83
WET SEASON: 16.5

SURFACE WATER BODY: ESTERO RIVER
GAGE STATION LOCATION: NW 1/4 SEC. 34 T 46 S R 25 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1987			6.73	5.05	2.48	1.55	2.57	5.30	10.5	31.8	45.0	4.18
1988	0.82	0.47	0.30	0.14	0.06	0.18	0.64	16.4	35.8	4.87	1.67	0.75
1989	0.67	0.58	0.64	0.26	0.14	0.26	1.80	2.60	10.1	5.58	1.26	0.58
1990	0.30	0.27	0.13	0.08	0.09	0.48	2.21	9.13	4.91	15.1	1.32	0.30
1991	1.27	1.30	0.46	0.81	1.84	5.95	34.3	39.0	24.5	20.9	2.09	0.68
1992	0.54	1.79	1.29	1.69	0.42	28.3	60.7	56.4	16.5	5.64	0.61	0.39
1993	1.33	1.09	1.37	1.41	0.23	0.13	0.78	2.52	20.25	8.17	7.43	1.05
1994	1.72	0.96	0.45	0.11	0.05	0.52	1.91	35.8	82.0	47.8	8.66	7.77
1995	8.21	4.21	1.03	0.63	0.36	9.14	45.2	126	142	187	14.1	1.48
1996	3.65	0.83	0.32	0.10	0.49	27.0	19.9	4.82	7.92	11.2	0.89	0.28
1997	0.15	0.05	0.05	0.18	0.34	2.39	22.8	9.82	25.1	18.9	1.12	26.1
1998	12.4	53.4	26.3	2.30	0.62	1.05	3.39	5.64	25.2	7.61	34.5	6.92
1999	5.57	4.50	3.71	3.26	3.11	9.70	28.8	45.7	9.71	52.6	9.13	2.16
2000	1.66	0.42	0.09	0.03	0.01	0.11	0.60	12.7	58.6			
MEAN	2.94	5.37	3.06	1.15	0.73	6.19	16.1	26.6	33.8	32.0	9.83	4.05

DRY SEASON: 2.88
WET SEASON: 27.1

SURFACE WATER BODY: FAKA UNION CANAL
GAGE STATION LOCATION: NE 1/4 NE 1/4 SEC. 9 T 52 S R 28 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1970	222	217	661	392	87.9	308	659	636	621	403	221	126
1971	76.3	51.8	21.6	0.10	0	115	255	738	200	881	259	69.5
1972	25.8	83.0	29.9	10.3	57.3	479	317	296	414	321	206	131
1973	96.0	47.8	9.8	4.50	0	3.0	537	762	1115	438	38.0	12.3
1974	14.4	10.3	0.14	0	7.09	274	932	1215	1043	297	47.2	47.9
1975	9.5	0.45	0	0	0	7.83	602	851	589	758	274	69.6
1976	1.00	1.00	1.35	1.00	32.5	352	249	100	128	316	154	84.5
1977	171	78.8	17.2	1.00	1.00	225	261	242	373	332	62.0	95.8
1978	137	169	238	112	122	282	356	567	520	417	128	71.8
1979	100	66.2	27.9	0.63	71.1	62.4	77.0	158	484	143	124	113
1980	82.5	97.2	92.9	82.0	51.3	45.6	124	299	687	277	156	114
1981	73.0	92.6	69.8	26.8	18.0	11.8	118	671	916	305	158	97.1
1982	42.6	13.2	53.7	26.1	105	724	417	691	932	1050	300	141
1983	136	410	432	330	36.4	301	522	370	385	835	504	301
1984	237	129	123	39.1	48.1	198	237	237	387		830	283
1985	28.7	0.79	0	0	0	63.7	557	759	746	541	315	147
1986	97.7	48.6	54.7	16.1	-0.30	202	305	362	484	567	522	439
1987	595	450	391	196	60.7	422	598	379	497	496	650	434
1988	137	63.9	17.7	-0.12	-0.15	-0.02	125	490	644		119	41.0
1989	1.61	-0.04	0.02	0	-0.04	-0.40	83.7	122	422	384	201	161
1990	71.2	21.8	-0.36	-0.33	-1.64	150	276	373	392	408	167	60.8
1991	262	142	70.1	60.8	209	581	1021	847	827	523	243	80.6
1992	32.2	33.2	55.5	32.5	0.18	175	537	712	846	401	125	64.0
1993	128	111	105	51.4	14.1	155	234		389	457	184	50.2
1994	39.1	60.3	28.5	17.2	2.55	91.0	203	585	889	638	458	627
1995	582	375	144	77.7	106	886	735	993	1606	1749	666	141
1996	69.7	17.0	19.6	16.8	59.1	320	371	378	255	541		
1997					119	292	560	566	269	174	32.1	
1998	191	156	226	36.4	-2.24	6.28	111	611	906	540	750	343
1999	199	43.6	-0.48	-3.86	-3.11	217	530	549	1030	1189	657	191
MEAN	133	103	99.7	52.6	40.0	231.63	397	537	633	549	295	162

DRY SEASON: 98.4
WET SEASON: 529

SURFACE WATER BODY: GOLDEN GATE CANAL SYSTEM (17 Ave SW)
GAGE STATION LOCATION: SW 1/4 SW 1/4 SEC. 13 T 49 S R 26 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1977										161	66	69
1978	74	95	181	80	66	91	214	485	257	124	61	49
1979	96	71	37	17	48	94	113	178	428	367	122	189
1980	113	146	69	33	49	40	142	188	233	147	94	83
1981	54	81	53	24	20	175	275	297	276	174	75	32
1982	13	7	5	4	16	527	278	531	432	486	230	115
1983	99	360	334	299	139	199	499	524	810	300	193	137
1984	130	96	165	97	49	122	401	295	379			

MEAN	83	122	121	79	55	178	274	357	402	251	120	96

DRY SEASON: 92.7
WET SEASON: 321

SURFACE WATER BODY: GOLDEN GATE CANAL SYSTEM (Airport Rd)
GAGE STATION LOCATION: NE 1/4 NE 1/4 SEC. 35 T 49 S R 25 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1964										251	140	97
1965	84	77	91	56	46	209	426	609	635	555	347	157
1966	135	200	198	157	130	392	1092	932	693	564	219	128
1967	111	145	173	84	48	296	565	744	588	934	298	212
1968	120	144	173	77	161	598	1280	592	740	362	.41.2	181
1969	127	125	132	103	85	576	646	514	469	529	426	211
1970	181	180	641	328	258	514	446	417	567	297	133	80
1971	46	67	21	2.4	1.5	118	444	785	1265	534	254	137
1972	79	107	62	88	168	594	562	488	894	524	260	243
1973	241	216	171	121	34	123	530	1174	1232	524	346	238
1974	224	138	61	19	22	693	1159	1195	958	315	105	188
1975	53	30	14	0.4	1.9	90	368	430	529	460	205	96
1976	34	19	17	21	631	704	443	462	569	211	100	44
1977	44	55	19	0.3	53	546	670	711	827	248	46	94
1978	98	130	266	84	112	296	426	683	449	161	77	66
1979	172	110	84	43	156	199	227	389	803	688	238	338
1980	215	299	236	98	111	105	331	350	613	345	222	153
1981	72	116	79	55	37	226	290	740	951	299	99	51
1982	22	12	13	20	90	637	603	681	599	630	235	158
1983	209	461	425	270	114	233	759	653	1079	459	307	134
1984	120	100	183	121	104	244	732	456	451			

MEAN	119	136	153	87	118	370	600	650	746	445	214	150

DRY SEASON: 127
WET SEASON: 610

SURFACE WATER BODY: GATOR SLOUGH
GAGE STATION LOCATION: NE 1/4 NW 1/4 SEC. 32 T 43 S R 23 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1986										29.4	14.9	13.2
1987	38.1	16.3	41.6	43.2	40.8	63.5	150	74.5	47.2	95.3	38.6	18.9
1988	7.09	6.50	17.6	9.22	3.06	1.40	96.90	159	125	17.4	16.9	5.80
1989	4.56	4.33	9.40	1.65	0.72	17.1				32.4	10.8	7.81
1990	3.99	4.15	2.90	1.25	13.7	46.7	47.1	64.5	23.3	17.6	4.87	2.10
1991	33.4	14.1	10.2	8.70	58.0	133	192	87.0	56.8	605	7.72	4.89
1992	2.45	10.3	14.6	13.9	4.30	135	157	136	87.5	31.0	6.47	5.45
1993	16.9	20.1	37.9	20.7	9.92	60.1	88.6	55.3	78.0	56.5	41.0	9.56
1994	10.5	14.7	12.6	26.2	14.8	11.8	51.1	56.5	147	54.4	19.5	11.5
1995	14.6	10.8	10.4	7.62	26.3	215	284	278	175	253	33.6	0.50
1996	23.4	2.94	4.22	4.62	13.3	79.7	84.3	116	119	188	42.2	4.91
1997	0.03	0	0	3.06	7.50	16.4	83.3	359	112	4.4	4.61	14.7
1998	15.1	23.8	18.6	4.38	0.96	2.57	1.66	3.96	24.3	4.14	4.56	2.47
1999	2.15	1.20	0.29	0.01	0.74	20.4	18.1	17.3	13.2			
2000						8.27	9.15	76.7	194			
MEAN	13.3	9.94	13.9	11.1	14.9	57.9	97.2	114	92.5	107	18.9	7.83

DRY SEASON: 11.8
WET SEASON: 103

SURFACE WATER BODY: GORDON RIVER
GAGE STATION LOCATION: NE 1/4 SE 1/4 SEC. 27 T 49 S R 25 E
STAGE (FEET, NGVD)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1971										2.59	2.62	2..01
1972	0.91	1.78	1.24	0.84	1.54	2.01	0.97	1.56	1.90	2.46	1.75	1.28
1973	1.10	0.71	0.84	0.76	0.71	0.72	1.02	1.57	1.46	1.40	1.24	0.74
1974	0.57	0.49	0.66	0.58	0.66	1.18	1.14	1.22	1.34	1.07	0.88	1.21
1975	0.54	0.71	0.59	0.57	0.84	1.20	2.02	1.13	2.00	3.11	1.62	0.85
1976	-0.22	-1.55	-2.10	-2.12	0.34	2.70	2.91	2.75	2.50			
1977		2.44			1.70							
1978				1.46	1.83	1.77	2.60					
1979										2.99	1.89	2.05
1980	1.89	2.28	2.12	1.55	1.05	0.85	1.85	2.74	2.63			
1981												
1982									2.52	2.04	1.52	1.32
1983	1.58	2.72	2.53	2.18	0.90	0.98	1.31	1.30	2.33	1.38	1.26	1.06
1984	0.96	0.74	1.53	1.21	1.02	1.65	1.53	1.08	1.42			
MEAN	0.92	1.15	0.93	0.78	1.06	1.45	1.71	1.67	2.01	2.13	1.60	1.22

DRY SEASON: 1.01
WET SEASON: 1.88

SURFACE WATER BODY: HENDERSON CREEK CANAL (SFWMD)
GAGE STATION LOCATION: SE 1/4 NE 1/4 SEC. 3 T 51 S R 26 E
STAGE (FEET, NGVD)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1983							0.74	0.88	1.19	1.04	0.72	
1984	0.46	0.32		0.58	0.51	0.76	0.89	0.90	1.10	1.03	0.87	0.65
1985	0.57				0.68	0.65	1.13	1.21	1.08	1.29	1.07	0.65
1986	0.51	0.58	0.39	0.88	1.08	1.05	1.00	1.23	1.46	1.33	1.12	0.91
1987	0.89	0.74	1.12	0.81	0.91	1.05	1.23	1.17	1.22	1.02	1.27	0.94
1988	0.61	0.64	0.61	0.93	0.81	0.91	0.91	1.03	1.41	1.27	1.13	0.13
1989	0.76	0.64	0.41	0.40	0.63	1.03	1.19	1.27	1.42	1.18	1.09	0.69
1990	0.60	0.66	1.01	0.93	1.20	1.12	1.24	1.59	1.44	1.40	1.28	0.99
1991	1.13	0.86	1.07	1.21	1.38	1.43	1.54	1.58	2.13	1.64	1.40	0.98
1992	1.09	1.16	0.89	1.12	1.19	1.57	1.40	1.56	1.76	1.86	1.34	1.15
1993	1.12	1.23	1.03	1.18	1.29	1.27	1.37	1.48	1.57	1.63	1.12	1.05
1994	0.74	0.88	1.00	0.91			1.11	1.46	1.58	1.57	1.31	1.23
1995	0.92	0.65	0.95	1.18	1.30		1.40	2.20	2.08	2.21	1.18	1.03
1996	0.73	0.36	0.65	0.88	0.96	1.07	1.16	1.25	1.37	1.49	1.12	0.72
1997	0.64		1.08	1.16	1.09	1.23	1.25	1.35	1.49	1.35	1.08	0.93
1998	0.81	1.13	0.94	0.99	1.17	1.10	1.15	1.23	1.65	1.30	1.18	0.99
1999	1.01	1.16	1.05	1.27	1.25	1.13	1.28	1.51	2.06	1.54	1.34	1.04
2000	1.80	1.87	1.07	1.11	1.10	1.21	1.47	1.40	1.74	1.53	1.32	0.88
MEAN	0.85	0.86	0.88	0.97	1.03	1.11	1.19	1.35	1.54	1.43	1.16	0.88

DRY SEASON: 0.91
WET SEASON: 1.38

SURFACE WATER BODY: HERMOSA CANAL
GAGE STATION LOCATION: SW 1/4 SW 1/4 SEC. 5 T 44 S R 23 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1987		2.16	2.78	1.16	4.44	34.6	29.6	21.5	7.21	85.1	47.0	13.9
1988	7.36	9.90	12.5	4.26	1.17	1.58	41.9	58.4	34.3	7.51	6.34	1.47
1989	5.40	4.38	9.59	4.14	1.82	21.0	55.0	62.0	43.7	23.3	11.4	9.75
1990	7.47	5.51	3.40	1.05	11.2	27.0	18.1	18.5	15.2	9.93	2.52	1.78
1991	19.3	5.87	6.33	5.28	25.6	45.8	79.0	28.3	31.6	37.3	6.08	3.71
1992	2.01	9.66	11.8	8.54	2.96	35.4	50.1	51.3	30.2	12.6	5.28	4.26
1993	9.14	11.4	16.2	8.97	5.35	35.0	50.9	26.7	30.8	32.9	22.3	6.53
1994	4.19	5.19	3.55	12.0	5.66	8.38	35.3	18.8	47.8	24.5	16.7	12.7
1995	12.1	6.94	6.64	6.05	10.1	79.5	92.9	114	85.4	88.1	17.7	3.75
1996	7.81	0.80	3.00	1.74	8.26	48.2	31.5	26.0	31.7	43.5	6.33	1.00
1997	0.23	0.55	0.09	2.00	5.94	9.46	38.5	76.7	49.9	21.4	9.68	53.5
1998	59.6	98.3	41.1	2.10	0.01	0.28	27.4	30.0	56.0	13.0	25.9	8.88
1999	4.79	1.43	0.07	0	0	37.2	33.3	16.4	44.5	42.6	12.8	4.31
2000	0.99	0	0	0	0	0.65	8.93	52.0	85.1			

MEAN	10.8	11.6	8.36	4.09	5.89	27.4	42.3	42.9	42.4	34.0	14.6	9.66

DRY SEASON: 8.40
WET SEASON: 40.4

SURFACE WATER BODY: HORSESHOE CANAL
GAGE STATION LOCATION: NW 1/4 NW 1/4 SEC. 5 T 44 S R 23 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1987		13.4	28.7	27.8	33.1	50.1	70.6	39.3	32.2	59.4	17.9	3.58
1988	1.77	1.51	5.70	4.19	1.07	0.51	36.6	66.6	46.0	7.74	7.11	2.52
1989	2.25	2.04	2.82	0.86	1.88	14.5	34.6	37.2	15.7	4.41	1.86	3.25
1990	4.57	3.90	2.81	0.93	12.8	40.4	31.0	27.9	12.7	17.9	4.81	1.46
1991	22.1	11.2	17.9	14.6	43.4	71.9	115	62.8	41.1	29.0	2.95	1.70
1992	0.73	5.03	5.97	4.71	1.20	59.6	65.3	62.5	41.7	12.5	4.02	3.44
1993	8.97	7.75	16.2	7.20	3.49	57.9	54.9	48.4	53.7	28.1	18.9	3.22
1994	4.15	4.34	3.00	8.76	4.24	4.17	34.3	29.8	58.8	18.6	8.26	4.23
1995	5.22	6.66	3.49	3.47	4.84	88.0	97.2	134	102	93.0	23.6	7.33
1996	20.3	3.48	3.12	1.84	5.43	45.2	41.0	32.8	43.0	45.0	3.63	0.89
1997	0.24	0.31	0.03	1.19	4.78	10.9	47.8	63.2	43.1	29.7	17.3	60.5
1998	62.4	130	72.9	13.2	1.14	4.61	66.8	50.4	98.1	16.5	27.4	7.59
1999	6.46	3.03	0.32	0	0	61.5	76.5	49.4	65.9	26.5	3.83	3.02
2000	3.77	1.06	0.06	0	0	2.48	8.90	27.5	73.7			
MEAN	11.0	13.8	11.6	6.34	8.38	36.6	55.7	52.3	52.0	29.9	10.9	7.90

DRY SEASON: 9.85
WET SEASON: 47.5

SURFACE WATER BODY: IMPERIAL RIVER

GAGE STATION LOCATION: SE 1/4 SW 1/4 SEC. 31 T 47 S R 26 E

FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1940						6.50	43.0	104	928	107	11.5	3.35
1941	86.3	141	50.2	207	55.4	59.4	342	238	203	108	31.3	7.85
1942	72.1	8.60	25.1	3.56	1.79	128	164	20.8	179	16.2	1.73	1.51
1943	1.46	1.29	1.18	1.15	1.15	93.6	315	241	153	72.1	3.40	1.90
1944	1.46	1.34	1.21	1.15	1.11	2.17	1.84	117	107	94.1	15.2	2.10
1945	1.73	1.18	1.05	0.90	0.82	71.8	287	404	333	125	20.0	2.25
1946	1.81	1.25	1.09	0.91	0.94	7.89	90.5	197	207	129	176	22.3
1947	2.79	1.77	45.8	11.0	2.44	332	274	402	1021	351	113	74.0
1948	38.4	23.6	2.19	1.47	1.18	1.30	97.5	125	366	374	21.2	2.44
1949	1.55	0.82	0.86	0.74	1.36	132	171	245	217	392	63.4	4.11
1950	1.64	1.23	0.93	1.16	0.72	0.86	126	38.1	191	7.01	2.16	1.75
1951	1.25	1.07	0.99	0.91	0.86	0.61	127	236	117	809	44.1	3.13
1952	1.32	1.52	1.69	1.02	0.91	2.35	104	118	174	234	67.2	8.37
1953	7.05	21.4	1.44	1.54	0.91	16.6	84.3	139	457	350	73.9	18.1
1954	4.21	1.36	1.45	1.40	1.37	2.67	75.2	86.4	129	119		
1987		48.6	76.5	80.6		117	111	150	102	338	376	219
1988	88.5	43.3	43.3	11.5	9.16	7.55	25.8	211	324	45.1	16.3	10.8
1989	7.44	6.88	8.34	7.35	6.49	7.20	28.6	67.7	128	37.2	13.6	12.8
1990	8.98	7.40	4.96	3.92	3.98	12.2	20.1	101	61.5	53.2	19.1	12.2
1991	31.9	20.5	13.6	19.8	51.3	92.9	471	466	248	278	85.6	28.0
1992	14.0	17.2	14.4	13.1	10.6	104	569	383	283	172	26.1	12.6
1993	18.5	14.7	40.4	38.6	9.34	9.08	31.8	41.1	174	204	98.2	32.1
1994	40.2	44.5	33.0	11.9	10.3	26.9	54.3	233	375	351	162	179
1995	185	127	50.7	23.8	17.9	94.0	192	709	1178	1097	387	87.1
1996	66.0	24.1	14.6	13.6	11.5	53.5	62.8	105	86.0	144	39.8	19.1
1997	13.7	12.0	9.11	7.93	6.39	9.02	132	198	81.9	49.6	14.6	97.1
1998	90.7	184	226	68.1	16.7	12.6	25.9	74.2	158	129	283	131
1999	78.2	32.4	14.4	9.54	8.10	39.7	457	422	481	566	223	65.1
2000	28.5	17.4	15.3	11.5	8.05	7.83	14.9	92.7	295			
MEAN	33.1	28.8	25.0	19.8	8.92	50.1	155	206	302	241	88.5	39.2

DRY SEASON: 25.8

WET SEASON: 226

SURFACE WATER BODY: MEADE CANAL
GAGE STATION LOCATION: NW 1/4 NE 1/4 SEC. 20 T 44S R 24 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1986												1.46
1987	2.32	3.05	4.08	4.33	3.44	4.95	10.4	6.64	4.27	8.15	5.19	2.06
1988	0.93	1.74	3.00	0.79	0.50	1.27	6.07	16.6	4.69	0	1.07	0.88
1989	0.82	0.29	0.75	0.15	0.35	2.77	22.3	21.5	19.8			
1990	0.67	0.51	0.57	0	1.00	12.8	18.7	7.87	8.75	4.87	1.40	0.42
1991	7.86	1.32	0.83	1.45	4.53	14.1	13.1	3.20	8.33	5.41	1.31	0.45
1992	0.89	3.91	4.47	2.71	0.42	12.0	8.14	7.28	4.14	0.32	0.79	1.08
1993	4.49	2.17	2.33	1.19	0.01	2.97	3.83	3.58	4.62	7.01	1.88	0.31
1994	2.46	0.11	0.29	2.23	2.36	1.98	4.44	4.23	4.79	3.18	0.88	1.26
1995	2.15	2.16	0.17	0.49	1.93	24.8	29.0	38.3	22.9	13.4	1.11	0.30
1996	8.38	2.55	2.27	0.89	0.74	9.06	1.59	8.03	4.30	1.95	0.11	0.52
1997	0.44	2.06	1.32	4.48	5.05	9.84	3.41	22.5	9.12	5.61	3.83	9.69
1998	8.45	16.3	5.80	0.64	0.43	8.84	19.1	23.0	10.2	1.95	0.11	0.52
1999	0.44	2.06	1.32	4.48	5.05	9.84	4.06	15.5	11.6	7.40	2.32	2.99
2000	4.17	2.30	1.71	0.61	0.74	1.48	11.4	8.54	16.9			
MEAN	3.18	2.90	2.07	1.75	1.90	8.33	11.1	13.3	9.60	4.94	1.67	1.69

DRY SEASON: 1.69
WET SEASON: 9.75

SURFACE WATER BODY: OKALOACOOCHE SLOUGH
GAGE STATION LOCATION: T 49 S R 30 E
STAGE (FEET, NGVD)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1979	11.5	11.3	11.1	9.6	11.3	11.1	11.6	11.9	13.7	14.1	13.5	13.5
1980	13.2	13.3	13.3	12.8	11.6	10.1	9.6	10.4	12.6			
1991	10.4	11.1	11.0	10.5	10.2	11.2	12.0	12.5	12.4	12.0	11.7	11.4
1992	11.1	11.0	11.1	10.8	9.8	10.1	12.3	12.1	12.0	11.8	11.4	11.2
1993	11.5	11.5	11.4	11.1	10.7	10.2	10.5	11.0	11.6	11.8	11.4	11.1
1994	11.0	11.1	11.0	10.6	10.5	10.3	10.6	11.1	12.2	12.3	12.1	12.4
1995	12.3	11.7	11.4	12.6	14.8	15.2	15.3	16.4	17.1			
MEAN	11.6	11.6	11.5	11.1	11.2	11.2	11.7	12.2	13.1	12.4	12.0	11.9

DRY SEASON: 11.5
WET SEASON: 12.3

SURFACE WATER BODY: HENDERSON CREEK CANAL
GAGE STATION LOCATION: SE 1/4 NE 1/4 SEC. 3 T 51 S R 26 E
STAGE (FEET, NGVD)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1983							0.74	0.88	1.19	1.04	0.72	
1984	0.46	0.32		0.58	0.51	0.76	0.89	0.90	1.10	1.03	0.87	0.65
1985	0.57				0.68	0.65	1.13	1.21	1.08	1.29	1.07	0.65
1986	0.51	0.58	0.39	0.88	1.08	1.05	1.00	1.23	1.46	1.33	1.12	0.91
1987	0.89	0.74	1.12	0.81	0.91	1.05	1.23	1.17	1.22	1.02	1.27	0.94
1988	0.61	0.64	0.61	0.93	0.81	0.91	0.91	1.03	1.41	1.27	1.13	0.13
1989	0.76	0.64	0.41	0.40	0.63	1.03	1.19	1.27	1.42	1.18	1.09	0.69
1990	0.60	0.66	1.01	0.93	1.20	1.12	1.24	1.59	1.44	1.40	1.28	0.99
1991	1.13	0.86	1.07	1.21	1.38	1.43	1.54	1.58	2.13	1.64	1.40	0.98
1992	1.09	1.16	0.89	1.12	1.19	1.57	1.40	1.56	1.76	1.86	1.34	1.15
1993	1.12	1.23	1.03	1.18	1.29	1.27	1.37	1.48	1.57	1.63	1.12	1.05
1994	0.74	0.88	1.00	0.91			1.11	1.46	1.58	1.57	1.31	1.23
1995	0.92	0.65	0.95	1.18	1.30		1.40	2.20	2.08	2.21	1.18	1.03
1996	0.73	0.36	0.65	0.88	0.96	1.07	1.16	1.25	1.37	1.49	1.12	0.72
1997	0.64		1.08	1.16	1.09	1.23	1.25	1.35	1.49	1.35	1.08	0.93
1998	0.81	1.13	0.94	0.99	1.17	1.10	1.15	1.23	1.65	1.30	1.18	0.99
1999	1.01	1.16	1.05	1.27	1.25	1.13	1.28	1.51	2.06	1.54	1.34	1.04
2000	1.80	1.87	1.07	1.11	1.10	1.21	1.47	1.40	1.74	1.53	1.32	0.88
MEAN	0.85	0.86	0.88	0.97	1.03	1.11	1.19	1.35	1.54	1.43	1.16	0.88

DRY SEASON: 0.91
WET SEASON: 1.38

SURFACE WATER BODY: SAN CARLOS CANAL
GAGE STATION LOCATION: SE 1/4 NE 1/4 SEC. 36 T 44S R 23E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1986												0.49
1987	1.93	3.46	3.65	2.03	2.13	6.29	11.0	7.01	2.40	9.75	3.19	1.02
1988	1.61	0.85	2.21	0.27	0	0.07	3.60	10.3	6.59	1.57	2.08	1.79
1989	0.84	0.69	1.30	0.01	0	1.55	9.59	6.32	10.9	4.82	1.62	1.83
1990	0.93	0.09	0.09	0	0	3.84	6.10	8.25	3.92	4.06	0.34	0
1991	7.10	0.98	0.33	0.68	0.99	2.80	8.74	10.4	11.9	8.83	0.44	0.14
1992	0.41	2.52	2.07	1.90	0.08	17.5	13.9	11.2	12.7	2.43	0.69	1.61
1993	2.45	2.86	4.27	1.22	0.19	2.62	10.2	8.07	11.8	14.1	4.55	1.43
1994	1.35	1.08	0.63	0.01	0	1.40	5.80	5.77	7.95	3.74	2.70	1.09
1995	2.07	0.39	0	0.14	0.33	34.1	33.8	20.3	39.5	19.8	2.26	0
1996	2.17	0	0.01	0.10	3.63	17.6	5.50	11.8	7.51	7.15	0.01	0
1997	0	0	0	0.95	0.67	1.24	0.04	12.1	6.31	2.74	0.64	9.42
1998	9.77	12.7	5.60	0	0	2.32	19.7	13.8	5.17	0	5.46	4.48
1999	9.17	0.77	0	0	0	20.5	7.23	4.48	19.6	7.13	0.84	0.39
2000	3.32	0.20	0	0	0	2.34	7.09	11.2	14.7			
MEAN	3.08	1.90	1.44	0.52	0.57	8.16	10	10	11	6.62	1.91	1.69

DRY SEASON: 1.53
WET SEASON: 9.59

SURFACE WATER BODY: SHADROE CANAL
GAGE STATION LOCATION: SE 1/4 SW 1/4 SEC. 8 T 44 S R 23 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1987		8.11	9.87	7.98	14.4	20.0	25.8	35.9	27.6	29.3	12.9	8.69
1988	5.43	4.90	4.69	1.61	0.26	0.01	3.35	9.19	19.6	2.56	8.92	2.42
1989	3.88	2.61	2.47	0.66	0.12	2.87	3.35	3.43	13.0	6.45	1.24	1.92
1990	1.13	1.82	0.37	0.07	2.23	7.28	9.85	7.95	3.77	2.67	0.50	0
1991	10.1	2.69	4.02	2.29	5.57	5.70	14.5	13.2	13.7	10.3	1.58	2.10
1992	1.34	4.06	2.49	1.97	0.36	22.3	41.7	39.8	17.3	5.68	1.67	1.56
1993	2.84	3.78	8.69	2.71	1.37	9.24	7.81	9.39	11.6	16.6	5.94	1.76
1994	3.30	2.79	0.85	2.59	0.54	0.32	8.64	8.93	28.1	8.86	5.04	3.08
1995	3.86	3.13	2.58	2.23	3.63	20.2	63.6	68.4	75.8	114	17.1	3.00
1996	15.7	2.82	2.91	2.40	5.19	15.4	12.4	11.0	9.44	19.4	3.98	1.85
1997	1.16	1.66	0.92	2.86	3.06	3.19	4.70	13.6	20.7	6.08	5.26	15.5
1998	19.3	38.2	13.1	3.19	1.17	0.02	17.5	10.1	12.4	2.87	7.76	3.67
1999	4.01	2.89	1.15	0.12	0	6.39	20.3	10.3	30.1	14.3	3.63	2.26
2000	2.84	1.81	0.48	0.30	0	1.25	12.3	22.8	50.4			
MEAN	5.76	5.81	3.90	2.21	2.71	8.15	17.6	18.9	23.8	18.4	5.81	3.68

DRY SEASON: 4.01
WET SEASON: 19.7

SURFACE WATER BODY: SIXMILE CYPRESS
GAGE STATION LOCATION: NW 1/4 NW 1/4 SEC. 31 T 45 S R 25 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1992	0	0	0	0.15	0	42.1	153	87.7	32.0	19.5	0	0
1993	0	0	13.4	0.08	0	0	0.94	2.79	45.3	67.3	18.8	0.19
1994	5.51	7.78	0	0	0.31	0	0.20	17.9	62.1	23.6	5.39	6.47
1995	13.7	6.01	0	0.21	0	13.3	63.5	195	238	216	38.0	0.46
1996	6.87	0	0	0	0	22.9	18.0	77.1	49.3	45.4	0.29	0
1997	0	0	0	0	0	0	8.78	36.2	26.3	31.9	0.18	22.7
1998	18.6	23.3	48.5	5.04	0	0	16.5	56.1	77.7			3.71
1999		2.19	0	0	0					34.7	23.4	0
2000	0	0	0	0	0	0	6.45	54.5	54.7			
MEAN	5.59	4.36	6.88	0.61	0.03	9.79	33.4	65.9	73.2	62.6	12.3	4.19

DRY SEASON: 3.61
WET SEASON: 58.8

SURFACE WATER BODY: SPRING CREEK
GAGE STATION LOCATION: SW 1/4 SE 1/4 SEC. 22 T 47S R 25 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1987											18.9	8.69
1988	3.35	1.99	2.58	1.05	0.81	0.43	0.90	9.62	22.5	5.86	2.90	1.63
1989	1.33	0.95	1.81	0.87	0.18	1.54	6.44	5.16	9.28	4.05	1.63	1.22
1990	1.42	1.30	0.91	0.11	0.19	3.54	7.72	14.1	10.5	14.8	3.62	1.70
1991	3.62	2.98	1.65	5.08	6.41	10.7	19.8	13.9	12.3	14.2	5.32	2.37
1992	1.51	3.31	2.34	2.48	0.69	28.9	38.7	41.5	17.3	7.70	2.40	1.02
1993	4.26	4.01	4.90	5.56	1.62	1.27	3.97	19.3	20.2	21.4	9.67	3.98
1994	5.91	4.97	2.39	1.00	0.47	2.14	6.61	13.5	42.1	14.1	7.47	9.61
1995	9.45	6.87	3.00	1.58	0.92	15.0	39.1	46.1	52.6	95.9	17.3	4.54
1996	5.73	2.16	1.25	1.20	1.65	11.9	9.20	7.45	9.20	14.7	5.08	1.57
1997	0.71	0.28	0.11	0.79	2.20	0.58	14.5	10.3	14.9	5.62	2.01	14.1
1998	5.75	15.3	11.8	3.02	1.18	0.65	5.24	9.55	13.0	5.38	26.5	6.68
1999	4.69	2.80	1.68	0.59	0.30	8.14	42.0	40.9	48.7	19.7	10.6	3.86
2000	2.38	1.86	1.43	1.61	0.74	0.98	3.72	17.0	37.1			
MEAN	3.85	3.75	2.76	1.92	1.34	6.60	15.2	19.1	23.8	18.6	8.72	4.69

DRY SEASON: 3.05
WET SEASON: 19.2

SURFACE WATER BODY: TENMILE CANAL
GAGE STATION LOCATION: SE 1/4 NE 1/4 SEC. 1 T 46 S R 24 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1988	9.33	6.91	3.46	0.30	0		3.90	117	68.9	14.7	9.83	1.03
1989	0.02	0	3.61	0.01	0.50	3.74				60.7	2.84	1.94
1990	0.83	2.61	1.85	0.01	0.02	138	555	201	119	119	7.93	0.91
1991	47.1	24.8	3.04	7.83	107	212	676	355	156	129	24.5	3.70
1992	1.56	7.48	9.33	10.8	0.91	141	329	237	111	41.5	4.32	4.00
1993	28.5	43.7	41.1	13.3	0.30	7.92	38.3	35.3	98.8	164	118	11.0
1994	13.0	13.5	2.32	14.6	7.30	2.13	24.3	157	331	88.5	58.7	56.4
1995	54.4	26.8	8.33	3.47	1.99	180	146	529	827	603	69.9	1.92
1996	54.8	10.2	9.17	5.16	6.35	129	77.0	165	121	129	8.72	4.86
1997	3.17	10.8	5.12	5.46	5.08	11.6	114	96.5	67.2	92.4	20.1	131.0
1998	65.8	186	136	6.12	0.67	1.20	60	162	255	65.0		31.0
1999	26.0	19.6	7.88	0	1.05					42.7	23.2	6.56
2000	6.10	7.10	8.26	1.97	0	3.05	32.9	94.6	330			
MEAN	23.9	27.7	18.4	5.31	10.1	75.5	187	195	226	129	31.6	21.2

DRY SEASON: 17.8
WET SEASON: 184

SURFACE WATER BODY: TOWNSEND CANAL
GAGE STATION LOCATION: NE 1/4 SW 1/4 SEC. 30 T 43 S R 28 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1975												66.1
1976	-66.9	-46.7	-63.3	-212	-64.3	155	140	95.6	77.2	-106	7.32	-24.8
1977	0.10	-23.9	-108	-198	44.9	67.5	112	197	106	-176	-98.4	7.65
1978	-7.06	-10.1	7.06	-164	-84.7	65.5	196	220	19.9	-5.90	-24.1	50.5
1979	223	-49.1	-55.5	-133	77.2	-68.2	105	-77.4	436	107	5.77	107
1980	4.90	14.3	-18.1	-47.0	-49.5	-221	56.2	153	131	-148	-6.28	-93.2
1981	-155	-120	-236	-267	-240	89.0	-50.5	238	211	-187	-178	-161
1982	-185	-30.0	-82.8	-26.5	-6.29	663	219	170	182	297	-168	-217
1983	31.7	417	284			305	88.5	130	252	165	-2.93	-56.7
1984	-22.7	-32.9	90.9	-60.0	53.3	173	257	64.6	-3.61	-108	66.2	
1985		-85.5	-133	-161	-136		176		119	-109	-121	
1986	-51.2	-62.1			-63.8	154	93.9					-1.06
1987		48.5	120	-21.0					8.06			
1988			20.0	-126	-55.0	-122	118	233	-158	-268	-58.7	-131
1989	-119	-277		-120	-172	-31.6	37.6	-30.4	-45.3	-20.2	-108	-195
1990			-213	-177	-96.7	-0.30	24.3	71.7			-35.4	
1991		-23.4	-40.8	-12.0			190	42.8	1.05	5.41	-3.27	-21.7
1992	-1.93	-3.23	-3.60	24.0	-71.6	GAGE DESTROYED JUNE 8, 1992						

MEAN	-29.1	-18.9	-28.8	-113	-61.8	94.5	117	116	95.4	-42.5	-51.8	-51.6

DRY SEASON: -50.6
WET SEASON: 71.6

SURFACE WATER BODY: WHISKEY CREEK
GAGE STATION LOCATION: NW 1/4 SE 1/4 SEC. 10 T 45 S R 24 E
FLOW (CFS)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1995	4.32	2.89	1.00	2.54	2.24	20.20	27.90	34.00	48.60	12.50	3.39	5.23
1996	8.10	4.50	4.82	3.86	6.18	32.40	20.40	11.20	15.40	16.30	1.41	1.52
1997	1.86	3.68	1.13	4.61	3.94	10.30	29.00	10.70	21.70	10.90	6.86	10.00
1998	7.03		10.60	3.55	3.45	16.40	23.00	22.70		6.86		3.31
1999	2.74	1.73	1.53	1.35	2.23	18.20		23.80	22.70	7.36	9.22	5.92
2000	2.54	1.51	3.95	5.32	2.93	6.85	17.90	25.60	40.10			
MEAN	4.43	2.86	3.84	3.54	3.50	17.39	23.64	21.33	29.70	10.78	5.22	5.20

DRY SEASON: 3.89
WET SEASON: 21.36

ATTACHMENT F

AGRICULTURAL ALLOCATIONS

SUMMARY OF AGRICULTURAL PERMITS IN THE STUDY AREA WITH ALLOCATIONS GREATER THAN 0.5 MGD

Permit #	Permittee	Location (S-T-R)	Max Day Allocation (MGD)
36-00006-W	Lattof Groves	23-43-27	1.03
36-00042-W	Adams	33-43-27	0.57
36-00043-W	Hunter Estate	27-43-26	3.72
36-00049-W	Lehigh Acres Dev.	8-45-27	0.76
36-00054-W	Black Diamond	33-45-24	2.18
36-00059-W	Pine Island Grove	10-45-22	0.98
36-00061-W	Corkscrew Growers	3-48-26	6.87
36-00062-W	Manley	1-48-26	7.85
36-00073-W	Florida Investors	35-45-23	0.70
36-00077-W	Rosbaugh Groves	34-46-27	1.13
36-00082-W	Hawkins	8-45-26	0.61
36-00084-W	Six L's Farm	34-46-26	6.57
36-00089-W	Zipperer Farms	26-44-25	2.15
36-00093-W	Trost Intl.	24-47-25	1.94
36-00100-W	Rigsby	13-43-25	0.59
36-00102-W	Alico Inc.	34-45-25	9.56
36-00111-W	Flint	8-44-26	0.83
36-00117-W	McJunkin	8-45-25	0.70
36-00119-W	Flint	27-45-27	1.44
36-00120-W	Goldberg	32-43-26	1.73
36-00124-W	Flint	8-43-26	1.01
36-00125-W	Ahern	12-43-26	1.39
36-00129-W	SBN Grove Main.	22-46-27	5.21
36-00130-W	Baucom	28-43-26	5.04
36-00167-W	Coop. Three	35-45-27	15.32
36-00201-W	Col Lee Grove	27-46-27	2.20
36-00218-W	Florida Farm Dev.	26-46-26	2.96
36-00283-W	Taggert	11-46-26	1.54
36-00315-W	Hubscham	8-47-26	5.17
36-00319-W	Moody Dev. Corp.	9-44-24	0.66

TABLE 3-6 (CONTINUED) SUMMARY OF AGRICULTURAL PERMITS IN THE STUDY AREA WITH ALLOCATIONS GREATER THAN 0.5 MGD

36-00321-W	Berry Grove	35-46-27	1.58
36-00327-W	Schoenbrun Farms	29-46-27	4.68
36-00564-W	WCI Communities	26-44-25	0.55
36-00572-W	Harvey Bros. Farms	32-43-22	1.05
36-00576-W	Winner Groves	26-46-27	2.65
36-00594-W	Blackburn	18-43-26	0.75
36-00612-W	Harper Bros.	1-46-26	8.36
36-00625-W	Tesone Land Co.	13-47-25	1.31
36-00640-W	RS & Son Farms	24-47-26	1.90
36-00695-W	Manley	2-48-26	6.38
36-00716-W	Harper Bros.	4-45-25	1.13
36-00720-W	Barber	3-46-24	0.51
36-00817-W	Louis	6-46-24	0.67
36-00821-W	Grant	35-47-26	0.57
36-00829-W	English Bros.	16-43-27	1.35
36-00902-W		15-46-26	1.64
36-01063-W	King	23-44-25	1.04
36-01110-W	Procacci/Gargiulo	2-48-26	8.97
36-01212-W	Stoney's	17-47-26	1.80
36-01365-W	Dwyer	19-46-27	1.04
36-01461-W	Troyer Bros.	28-45-27	8.67
36-01614-W	Desimone	27-44-25	0.82
36-01678-W	Webb Wright	6-44-22	0.60
36-01762-W	Tropic Grove	24-46-27	3.10
36-01763-W	Youngquist	24-46-27	3.33
36-02070-W	Youngquist	36-46-27	0.73
36-02094-W	Saka Seed	28-45-27	0.79
36-02141-W	Newcomb	35-43-27	0.80
36-02415-W	Pacific Tomato	8-46-26	0.97
36-02715-W	Kelly	10-45-22	0.75

TABLE 3-6 (CONTINUED) SUMMARY OF AGRICULTURAL PERMITS IN THE STUDY AREA WITH ALLOCATIONS GREATER THAN 0.5 MGD

36-02932-W	Pritchett	15-43-25	1.37
36-02991-W	Hermes Site	33-45-24	1.03
36-02992-W	Rubin	34-45-24	0.55
36-03588-W	TWI 75 Treeco	2-44-25	1.32
36-03650-W	Pacific Tomato	34-45-26	6.48
36-03768-W		13-45-26	4.61
36-03772-W	Alico 587 Land Trust	4-46-26	3.50
11-00036-W	Brown Farms	36-45-28	4.87
11-00041-W	Procacci/Gargiulo	9-48-26	5.87
11-00043-W	Lely Dev. Corp.	19-50-26	0.85
11-00055-W	Johnson	8-47-28	3.41
11-00072-W	Southern Tree Farms	7-51-27	1.25
11-00076-W	Farm Op.	8-51-27	31.39
11-00079-W	West Florida Agro	5-51-27	11.57
11-00082-W	Pepper	21-46-28	30.10
11-00086-W	Collier Dev. Corp.	24-50-25	0.94
11-00089-W	Barron Collier Co.	27-48-25	1.23
11-00090-W	Naples Reserve Golf	31-50-27	1.57
11-00092-W	Halstatt Part.	13-49-25	1.18
11-00093-W	Rosbugh Estate	12-46-28	1.20
11-00094-W	Turner Groves	2-46-28	16.63
11-00095-W	Sun Coast Vegetable	13-51-26	21.98
11-00097-W	Florida Farm Dev.	10-51-27	8.73
11-00106-W	Collier Enterprises	22-48-28	47.59
11-00112-W	Collier Enterprises	26-47-28	49.85
11-00113-W	Barron Collier	1-47-28	22.99
11-00116-W	Rogers Seed	6-51-27	3.41
11-00118-W	Pulling	1-49-25	2.03
11-00121-W	Serenoa Farms	13-47-28	17.42
11-00128-W	Alico Inc.	34-45-28	17.49

TABLE 3-6 (CONTINUED) SUMMARY OF AGRICULTURAL PERMITS IN THE STUDY AREA WITH ALLOCATIONS GREATER THAN 0.5 MGD

11-00136-W	Asgrow Seed Co.	27-48-26	1.27
11-00158-W	Manley & Brugger	13-49-25	1.60
11-00164-W	Harvey Brothers	27-48-26	9.60
11-00180-W	Bay West Nursery	21-48-26	1.00
11-00198-W	West Florida Agro	8-51-27	3.53
11-00201-W	South Naples Citrus	25-50-26	1.03
11-00257-W	Tree Plateau	26-48-26	0.59
11-00261-W	Barron Collier	24-47-28	30.40
11-00262-W	Turner Groves	1-46-28	27.90
11-00323-W	Eagle Island	13-47-27	1.01
11-00324-W	Troyer Inc.	14-47-27	1.26
11-00352-W	Gargiulo	27-47-27	1.15
11-00386-W	Williams	36-46-28	5.72
11-00397-W	Collier Enterprises	14-47-28	3.74
11-00416-W	Rogers Seed	7-51-27	1.22
11-00440-W	Rex Properties	22-46-28	3.62
11-00443-W	Mule Pen Quarry	10-48-26	3.79
11-00451-W	Hubschman	28-50-26	0.76
11-00462-W	Interscape Inc.	24-49-26	0.58
11-00547-W	Winchester Lakes	16-48-28	2.24
11-00590-W	Citrus Grove Part.	13-48-27	2.88
11-00606-W		22-50-26	1.90
11-008881-W	Bryan	13-48-27	1.52
11-01575-W	South Naples Citrus	25-47-27	0.50

ATTACHMENT G

COST BREAKDOWN BY SUBREGION

Funding Information Including Grants

Conceptual Capital Cost Evaluation for Geographic Subregion #1 -- Cape Coral, Waterway Estates, and North Ft. Myers

Proposed Alternative	Estimated Benefit (MGD)	Description	Capital Cost	Annual O & M Cost	Total Cost
Surface Water ASR					
Gator Slough	7.0	9 Wells and Pumping Station	$9,840,000	$131,000	$9,980,000
Horseshoe Canal	3.0	4 Wells and Pumping Station	$5,240,000	$65,000	$5,310,000
Hermosa Canal	3.0	4 Wells and Pumping Station	$5,240,000	$65,000	$5,310,000
Reclaimed Water ASR					
East of Del Prado Blvd. near Veterans Memorial Parkway	2.0	3 Wells and Pumping Station	$3,710,000	$44,000	$3,760,000
Interconnect					
Between Cape Coral and North Ft. Myers	N/A	Reuse Interconnect	$530,000	N/A	$530,000
Mine Pits					
Limerock	0.8	6 wells	$480,000	N/A	$480,000
Jay Rock	0.8	6 wells	$480,000	N/A	$480,000
Babcock	1.8	10 wells	$800,000	N/A	$800,000
Sum	18.4		$26,550,000	$305,000	$26,860,000

1. Amortization of 20 years
2. Interest rate = 8%
3. Includes $150,000 for supplementary infrastructure

Conceptual Capital Cost Evaluation for Geographic Subregion #2 -- Ft. Myers Central, Ft. Myers South, Gateway, and Lehigh Acres

Proposed Alternative	Estimated Benefit (MGD)	Description	Capital Cost	Annual O & M Cost	Total Cost
Reclaimed Water ASR					
East of I-75, SW of 82	9.0	12 Wells and Pumping Station	$12,010,000	$161,000	$12,180,000
Interconnect					
Along Daniels Pkwy. and Six Mile Cypress	N/A	Reuse Interconnect	$3,360,000	N/A	$3,360,000
Sum	9.0		$15,520,000	$161,000	$15,540,000

1. Amortization of 20 years
2. Interest rate = 8%
3. Includes $150,000 for supplementary infrastructure

Conceptual Capital Cost Evaluation for Geographic Subregion #3 -- GES, Fiesta Village, and Ft. Myers Beach

Proposed Alternative	Estimated Benefit (MGD)	Description	Capital Cost	Annual O & M Cost	Total Cost
Surface Water ASR					
Ten Mile Canal	12.0	16 Wells and Pumping Station	$15,380,000	$206,000	$15,590,000
Reclaimed Water ASR					
South of Gladiolus Dr. between S. Tamiami Trail and Summerlin Rd.	5.0	7 Wells and Pumping Station	$7,550,000	$95,000	$7,650,000
Interconnect					
Along Daniels Pkwy. and south along I-75	N/A	Reuse Interconnect	$3,480,000	N/A	$3,480,000
Sum	17.0		$26,560,000	$301,000	$26,870,000

1. Amortization of 20 years
2. Interest rate = 8%
3. Includes $150,000 for supplementary infrastructure

Conceptual Capital Cost Evaluation for Geographic Subregion #4 -- North Collier, Pelican Bay, and Bonita Springs

Proposed Alternative	Estimated Benefit (MGD)	Description	Capital Cost	Annual O & M Cost	Total Cost
Surface Water ASR					
Cocohatchee Canal	5.0	7 Wells and Pumping Station	$7,550,000	$95,000	$7,650,000
Imperial River	15.0	20 Wells and Pumping Station	$19,330,000	$257,000	$19,590,000
Golden Gate Canal - 17th Ave.	20.0	27 Wells and Pumping Station	$26,630,000	$332,000	$26,970,000
Reclaimed Water ASR					
North of Immokalee Rd. between I-75 and Tamiami Trail	4.0	6 Wells and Pumping Station	$6,020,000	$80,000	$6,100,000
Interconnect					
Along US 41 north of County Boundary	N/A	Reuse Interconnect	$550,000	N/A	$550,000
Mine Pits					
Golden Gate	1.5	6 wells	$480,000	N/A	$480,000
Surface Water Withdrawals*					
Golden Gate Canal - 17 Ave.	6.0		N/A	N/A	N/A
Sum	51.5		$60,750,000	$770,000	$61,520,000

1. Amortization of 20 years
2. Interest rate = 8%
3. Includes $150,000 for supplementary infrastructure

* Costs are included in the sums for surface water ASR as the same infrastructure will be utilized

Conceptual Capital Cost Evaluation for Geographic Subregion #5 -- Naples, South Collier, and Marco Island

Proposed Alternative	Estimated Benefit (MGD)	Description	Capital Cost	Annual O & M Cost	Total Cost
Surface Water ASR					
Golden Gate Canal - Airport/Livingston	25.0	34 Wells and Pumping Station	$28,530,000	$386,000	$28,920,000
Faka Union Canal	25.0	34 Wells and Pumping Station	$40,410,000	$386,000	$40,800,000
Reclaimed Water ASR					
Near Davis Blvd. & Airport Pulling Rd.	7.5	10 Wells and Pumping Station	$10,630,000	$139,000	$10,770,000
Interconnect					
At Golden Gate and Livingston	N/A	Reuse Interconnect	$268,000	N/A	$268,000
Surface Water Withdrawals*					
Golden Gate Canal - Airport/Livingston	8.2		N/A	N/A	N/A
Faka Union Canal	6.4				
Sum	72.1		$79,990,000	$920,000	$80,910,000

1. Amortization of 20 years
2. Interest rate = 8%
3. Includes $150,000 for supplementary infrastructure

* Costs are included in the sums for surface water ASR as the same infrastructure will be utilized

Table 1
South Florida Water Management District
Irrigation Water Supply Costs
Summary of Total Costs by Subregion

Subregion	1	2	3	4	5
Annual Debt Service	$ 1,027,900	$ 605,100	$ 1,031,700	$ 3,622,600	$ 5,119,800
Debt Service Coverage [1]	256,975	151,275	257,925	905,650	1,279,950
Annual O & M Costs [2]	303,251	160,617	299,684	761,536	909,129
Total	$ 1,588,126	$ 916,992	$ 1,589,309	$ 5,289,786	$ 7,308,879
Production:					
MGD	18.4	9.0	17.0	51.5	72.1
Average Days Per Year	180	180	180	180	180
Annual gallons (000)	3,312,000	1,620,000	3,060,000	9,270,000	12,978,000
Cost per 1000 gallons [1]	$ 0.48	$ 0.57	$ 0.52	$ 0.57	$ 0.56
Cost per 1000 gallons w/out grant funding [3]	$ 0.87	$ 1.03	$ 0.94	$ 0.72	$ 0.67

(1) The debt service coverage funding amounts shown represent an allowance of 25% of the annual debt service based on the SRF Loan Program's minimum coverage requirement of 15% adjusted upward to also reflect the need for funding certain renewals and replacements that may occur during the term of the loans.

(2) Annual operations and maintenance (O & M) costs include:

1. Daily adjustment of injection rates, measurement of water quality
2. Weekly sample procurement for laboratory analyses
3. Calibration of flowmeters and gauges semi-annually
4. Preparation of monthly regulatory reports to FDEP.
5. Submersible pump maintenance
6. General Maintenance
7. Record keeping
8. Electricity for pumping
9. Costs for pretreatment and filtration

(3) Displays cost per 1000 gallons with only SRF funding

Table 2
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 1 Summary of Project Costs

Project	Itemized Capital Costs ($M)						($M)		Estimated	Financing %	
	Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	Operations and Maintenance	Total Costs	Benefit (MGD)	SRF	Bond
SUB 1 6. Gator Slough	9 wells and pumping station	5.2	1.3	0.18	1.2	9.8	2.0	11.8	7.0	100%	0%
SUB 1 7. Hermosa Canal	4 wells and pumping station	2.4	1.1	0.08	0.6	5.2	1.0	6.2	3.0	100%	0%
SUB 1 8. Horseshoe Canal	4 wells and pumping station	2.4	1.1	0.08	0.6	5.2	1.0	6.2	3.0	100%	0%
SUB 1 4. Cape Coral/Waterway Estates/ North Ft. Myers	3 wells and pumping station	1.5	1.0	0.06	0.4	3.7	0.6	4.3	2.0	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	0.42	0.0	0.5	0.0	0.5	0.0	100%	0%
Mine Pits	22 wells	1.4	0.0	0.0	0.0	1.8	0.0	1.8	3.4	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	100%	0%
Subregion Totals		12.9	4.4	0.8	2.9	26.5	4.5	30.9	18.4	26.5	0.0

Annualized Costs:

Debt Service	$	1,027,900
Coverage		256,975
O&M		303,251
Total Cost	$	1,588,126

Production:

MGD	18.4
Days per year	180
Annual 1000 gal	3,312,000

Annual Cost per 1000 gallons	$	0.48

Worksheet 2A
Irrigation Water Supply Costs
Subregion 1
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		26,500,000
2	Adjustment - 50% Grant Funding/$14M Maximum		(13,250,000)
3	Net Amount of Projects Funded from Loan		13,250,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	397,500
5	Loan Service Fee	2.00%	265,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		662,500
9	Capitalized Interest		696,000
10	Additional Proceeds		0
11	Principal Amount of Loan		14,608,500
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		1,027,900

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 3,312,500	3,312,500	25.0%	$ 58,000
2	$ 6,625,000	9,937,500	50.0%	232,000
3	$ 3,312,500	13,250,000	25.0%	406,000
4	$ -	13,250,000	0.0%	0
5	$ -	13,250,000	0.0%	0
				$ 696,000
	Total Capitalized Interest			$ 696,000

Line No.	Description	Percent	Amount
	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

Line No.	Summary of Annual Debt Service:	
33	SRF Loan	$1,027,900
34	Revenue Bonds	$0
35	Total	$1,027,900

Table 3
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 2 Summary of Project Costs

Option Description	Itemized Capital Costs ($M) Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	($M) Operations and Maintenance	Total Costs	Estimated Benefit (MGD)	Financing % SRF	Bond
SUB 2											
5. Ft. Myers Central and South/ Gateway/Lehigh Acres	12 wells and pumping station	6.5	1.4	0.23	1.4	12.0	2.4	14.4	9.0	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	2.69	0.0	3.36	0.0	3.36	0.0	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.15	0.0	0.0	0.0	100%	0%
Subregion Totals		6.5	1.4	2.9	1.4	15.6	2.4	17.8	9.0	15.6	0.0

Annualized Costs:

Debt Service	$	605,100
Coverage		151,275
O&M		160,617
Total Cost	$	916,992

Production:

MGD	9.0
Days per year	180
Annual 1000 gal	1,620,000

Annual Cost per 1000 gallons	$	0.57

Worksheet 3A
Irrigation Water Supply Costs
Subregion 2
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		15,600,000
2	Adjustment - 50% Grant Funding/$14M Maximum		(7,800,000)
3	Net Amount of Projects Funded from Loan		7,800,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	234,000
5	Loan Service Fee	2.00%	156,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		390,000
9	Capitalized Interest		410,000
10	Additional Proceeds		0
11	Principal Amount of Loan		8,600,000
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		605,100

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 1,950,000	1,950,000	25.0%	$ 34,000
2	$ 3,900,000	5,850,000	50.0%	137,000
3	$ 1,950,000	7,800,000	25.0%	239,000
4	$ -	7,800,000	0.0%	0
5	$ -	7,800,000	0.0%	0
				$ 410,000
	Total Capitalized Interest			$ 410,000

	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

	Summary of Annual Debt Service:	
33	SRF Loan	$605,100
34	Revenue Bonds	$0
35	Total	$605,100

Table 4
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 3 Summary of Project Costs

Option Description	Itemized Capital Costs ($M)						($M)		Estimated	Financing	
	Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	Operations and Maintenance[2]	Total Costs	Benefit (MGD)	SRF	Bonds
SUB 3 5. Ten Mile Canal	16 wells and pumping station	8.6	1.6	0.31	1.8	15.4	3.1	18.5	12.0	100%	0%
SUB 3 3. GES/Fiesta Village/ Ft. Myers Beach	7 wells and pumping station	3.8	1.2	0.14	0.9	7.5	1.4	9.0	5.0	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	2.78	0.0	3.5	0.0	3.5	0.0	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.15	0.0	0.0	0.0	100%	0%
Subregion Totals		12.4	2.8	3.2	2.7	26.6	4.5	30.9	17.0	26.6	0.00

Annualized Costs:

Debt Service		$ 1,031,700
Coverage		257,925
O&M		299,684
Total Cost		$ 1,589,309
Production:		
MGD	17.0	
Days per year	180	
Annual 1000 gallons	3,060,000	
Annual Cost per 1000 gallons		$ 0.52

Worksheet 4A
Irrigation Water Supply Costs
Subregion 3
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		26,600,000
2	Adjustment - 50% Grant Funding/$14M Maximum		(13,300,000)
3	Net Amount of Projects Funded from Loan		13,300,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	399,000
5	Loan Service Fee	2.00%	266,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		665,000
9	Capitalized Interest		698,000
10	Additional Proceeds		0
11	Principal Amount of Loan		14,663,000
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		1,031,700

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 3,325,000	3,325,000	25.0%	$ 58,000
2	$ 6,650,000	9,975,000	50.0%	233,000
3	$ 3,325,000	13,300,000	25.0%	407,000
4	$ -	13,300,000	0.0%	0
5	$ -	13,300,000	0.0%	0
				$ 698,000
	Total Capitalized Interest			$ 698,000

Line No.	Description	Percent	Amount
	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

Summary of Annual Debt Service:

SRF Loan	$1,031,700
Revenue Bonds	$0
Total	$1,031,700

Table 5
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 4 Summary of Project Costs

Option Description	Itemized Capital Costs ($M)						($M)		Estimated Benefit (MGD)	Financing	
	Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	Operations and Maintenance[2]	Total Costs		SRF	Bond
SUB 4 4. Cocohatchee River	7 wells and pumping station	3.8	1.2	0.14	0.9	7.5	1.4	9.0	5.0	100%	0%
SUB 4 9. Imperial River	20 wells and pumping station	10.8	2.0	0.39	2.3	19.3	3.8	23.2	15.0	100%	0%
SUB 4 2. North Collier/Pelican Bay/ Bonita Springs	6 wells and pumping station	2.9	1.1	0.12	0.7	6.0	1.2	7.2	4.0	100%	0%
SUB 4 1. Golden Gate Canal - SW 17th Ave.	27 wells and pumping station	14.1	2.2	2.11	2.9	26.6	5.0	31.6	20.0	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	0.4	0.0	0.55	0.0	0.55	0.0	100%	0%
Mine Pits	6 wells	0.4	0.0	0.0	0.0	0.48	0.0	0.48	1.5	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	100%	0%
Surface Water Withdrawals Golden Gate Canal - 17th Ave. (added 10/24/02)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	100%	0%
Subregion Totals		32.0	6.4	3.2	6.8	60.7	11.4	72.0	51.5	**60.7**	**0.0**

Annualized Costs:

Debt Service	$	3,622,600
Coverage		905,650
O&M		761,536
Total Cost	$	5,289,786

Production:	
MGD	51.5
Days per year	180
Annual 1000 gal	9,270,000

Annual Cost per 1000 gallons $ 0.57

Worksheet 5A
Irrigation Water Supply Costs
Subregion 4
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		60,700,000
2	Adjustment - 50% Grant Funding/$14M Maximum		(14,000,000)
3	Net Amount of Projects Funded from Loan		46,700,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	1,401,000
5	Loan Service Fee	2.00%	934,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		2,335,000
9	Capitalized Interest		2,451,000
10	Additional Proceeds		0
11	Principal Amount of Loan		51,486,000
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		3,622,600

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 11,675,000	11,675,000	25.0%	$ 204,000
2	$ 23,350,000	35,025,000	50.0%	817,000
3	$ 11,675,000	46,700,000	25.0%	1,430,000
4	$ -	46,700,000	0.0%	0
5	$ -	46,700,000	0.0%	0
				$ 2,451,000
	Total Capitalized Interest			$ 2,451,000

	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

		Summary of Annual Debt Service:	
33		SRF Loan	$3,622,600
34		Revenue Bonds	$0
35		Total	$3,622,600

Table 6
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 5 Summary of Project Costs

Option Description	Itemized Capital Costs ($M)						($M)		Estimated	Financing	
	Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	Operations and Maintenance[2]	Total Costs	Benefit (MGD)	SRF	Bond
SUB 5 2. Golden Gate Canal - Airport Road	34 wells and pumping station	16.5	2.3	0.66	3.4	28.5	5.8	34.3	25.0	100%	0%
SUB 5 3. Faka Union Slough	34 wells and pumping station	16.5	2.3	10.17	3.4	40.4	5.8	46.2	25.0	100%	0%
SUB 5 1. Naples/South Collier/Marco	10 wells and pumping station	5.6	1.4	0.20	1.3	10.6	2.1	12.7	7.5	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	0.21	0.0	0.27	0.0	0.3	0.0	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.15	0.0	0.0	0.0	100%	0%
Surface Water Withdrawals Goden Gate Canal - Airport/Livingston (added 10-24-02)		0.0	0.0	0.00	0.0	0.0	0.0	0.0	8.2	100%	0%
Surface Water Withdrawals Faka Union Canal (added 10-24-02)		0.0	0.0	0.00	0.0	0.0	0.0	0.0	6.4	100%	0%
Subregion Totals		38.6	6.0	11.2	8.0	80.0	**13.6**	93.5	72.1	80.0	0.0

Annualized Costs:

Debt Service		$ 5,119,800
Coverage		1,279,950
O&M		909,129
Total Cost		$ 7,308,879
Production:		
MGD	72.1	
Days per year	180	
Annual 1000 gallons	12,978,000	
Cost per 1000 gallons		$ 0.56

Worksheet 6A
Irrigation Water Supply Costs
Subregion 5
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		80,000,000
2	Adjustment - 50% Grant Funding/$14M Maximum		(14,000,000)
3	Net Amount of Projects Funded from Loan		66,000,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	1,980,000
5	Loan Service Fee	2.00%	1,320,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		3,300,000
9	Capitalized Interest		3,465,000
10	Additional Proceeds		0
11	Principal Amount of Loan		72,765,000
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		5,119,800

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 16,500,000	16,500,000	25.0%	$ 289,000
2	$ 33,000,000	49,500,000	50.0%	1,155,000
3	$ 16,500,000	66,000,000	25.0%	2,021,000
4	$ -	66,000,000	0.0%	0
5	$ -	66,000,000	0.0%	0
				$ 3,465,000
	Total Capitalized Interest			$ 3,465,000

	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

	Summary of Annual Debt Service:		
33	SRF Loan		$5,119,800
34	Revenue Bonds		$0
35	Total		$5,119,800

Funding Information Without Grants

Table 1
South Florida Water Management District
Irrigation Water Supply Costs
Summary of Total Costs by Subregion

Subregion	1 Gator Slough Horseshoe Canal Hermosa Canal Cape Coral/Water- Way Estates/ N. Fort Myers	2 Ft. Myers Central & South/Gateway/ Lehigh Acres	3 Ten Mile Canal GES/ Fiesta Village/ Fort Myers Bch.	4 Cocohatchee & Imperial Rivers Golden Gate Canal (SW 17th Ave.) North Collier/ Pelican Bay/ Bonita Springs	5 Golden Gate Canal (Airport Road) Faka Union Slough Naples/South Collier/ Marco
Annual Debt Service	$ 2,055,700	$ 1,210,100	$ 2,063,500	$ 4,708,700	$ 6,205,800
Debt Service Coverage(1)	513,925	302,525	515,875	1,177,175	1,551,450
Annual O & M Costs (2)	303,251	160,617	299,684	761,536	909,129
Total	$ 2,872,876	$ 1,673,242	$ 2,879,059	$ 6,647,411	$ 8,666,379
Production:					
MGD	18.4	9.0	17.0	51.5	72.1
Average Days Per Year	180	180	180	180	180
Annual gallons (000)	3,312,000	1,620,000	3,060,000	9,270,000	12,978,000
Cost per 1000 gallons	$ 0.87	$ 1.03	$ 0.94	$ 0.72	$ 0.67

(1) The debt service coverage funding amounts shown represent an allowance of 25% of the annual debt service based on the SRF Loan Program's minimum coverage requirement of 15% adjusted upward to also reflect the need for funding certain renewals and replacements that may occur during the term of the loans.

(2) Annual operations and maintenance (O & M) costs include:

1. Daily adjustment of injection rates, measurement of water quality
2. Weekly sample procurement for laboratory analyses
3. Calibration of flowmeters and gauges semi-annually
4. Preparation of monthly regulatory reports to FDEP.
5. Submersible pump maintenance
6. General Maintenance
7. Record keeping
8. Electricity for pumping

Table 2
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 1 Summary of Project Costs

Project	Itemized Capital Costs ($M) Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	($M) Operations and Maintenance	Total Costs	Estimated Benefit (MGD)	Financing % SRF	Bond
SUB 1 6. Gator Slough	9 wells and pumping station	5.2	1.3	0.18	1.2	9.8	2.0	11.8	7.0	100%	0%
SUB 1 7. Hermosa Canal	4 wells and pumping station	2.4	1.1	0.08	0.6	5.2	1.0	6.2	3.0	100%	0%
SUB 1 8. Horseshoe Canal	4 wells and pumping station	2.4	1.1	0.08	0.6	5.2	1.0	6.2	3.0	100%	0%
SUB 1 4. Cape Coral/Waterway Estates/ North Ft. Myers	3 wells and pumping station	1.5	1.0	0.06	0.4	3.7	0.6	4.3	2.0	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	0.42	0.0	0.5	0.0	0.5	0.0	100%	0%
Mine Pits	22 wells	1.4	0.0	0.0	0.0	1.8	0.0	1.8	3.4	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	100%	0%
Subregion Totals		12.9	4.4	0.8	2.9	26.5	4.5	30.9	18.4	26.5	0.0

Annualized Costs:

Debt Service	$ 2,055,700
Coverage	513,925
O&M	303,251
Total Cost	$ 2,872,876

Production:
MGD
Days per year
Annual 1000 gal

Annual Cost per 1000 gallons #REF!

Worksheet 2A
Irrigation Water Supply Costs
Subregion 1
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		26,500,000
2	Adjustment - 50% Grant Funding/$14M Maximum		0
3	Net Amount of Projects Funded from Loan		26,500,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	795,000
5	Loan Service Fee	2.00%	530,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		1,325,000
9	Capitalized Interest		1,392,000
10	Additional Proceeds		0
11	Principal Amount of Loan		29,217,000
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		2,055,700

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 6,625,000	6,625,000	25.0%	$ 116,000
2	$ 13,250,000	19,875,000	50.0%	464,000
3	$ 6,625,000	26,500,000	25.0%	812,000
4	$ -	26,500,000	0.0%	0
5	$ -	26,500,000	0.0%	0
				$ 1,392,000
	Total Capitalized Interest			$ 1,392,000

	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

	Summary of Annual Debt Service:	
33	SRF Loan	$2,055,700
34	Revenue Bonds	$0
35	Total	$2,055,700

Table 3
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 2 Summary of Project Costs

Option Description	Itemized Capital Costs ($M)						($M)		Estimated	Financing %	
	Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	Operations and Maintenance	Total Costs	Benefit (MGD)	SRF	Bond
SUB 2 5. Ft. Myers Central and South/ Gateway/Lehigh Acres	12 wells and pumping station	6.5	1.4	0.23	1.4	12.0	2.4	14.4	9.0	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	2.69	0.0	3.36	0.0	3.36	0.0	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.15	0.0	0.0	0.0	100%	0%
Subregion Totals		6.5	1.4	2.9	1.4	15.6	2.4	17.8	9.0	15.6	0.0

Annualized Costs:

Debt Service		$ 1,210,100
Coverage		302,525
O&M		160,617
Total Cost		$ 1,673,242
Production:		
MGD	9.0	
Days per year	180	
Annual 1000 gal	1,620,000	
Annual Cost per 1000 gallons		$ 1.03

Worksheet 3A
Irrigation Water Supply Costs
Subregion 2
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		15,600,000
2	Adjustment - 50% Grant Funding/$14M Maximum		0
3	Net Amount of Projects Funded from Loan		15,600,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	468,000
5	Loan Service Fee	2.00%	312,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		780,000
9	Capitalized Interest		819,000
10	Additional Proceeds		0
11	Principal Amount of Loan		17,199,000
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		1,210,100

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 3,900,000	3,900,000	25.0%	$ 68,000
2	$ 7,800,000	11,700,000	50.0%	273,000
3	$ 3,900,000	15,600,000	25.0%	478,000
4	$ -	15,600,000	0.0%	0
5	$ -	15,600,000	0.0%	0
				$ 819,000
	Total Capitalized Interest			$ 819,000

	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

	Summary of Annual Debt Service:		
33	SRF Loan	$1,210,100	
34	Revenue Bonds	$0	
35	Total	$1,210,100	

Table 4
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 3 Summary of Project Costs

Option Description	Itemized Capital Costs ($M)						($M)		Estimated Benefit (MGD)	Financing	
	Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	Operations and Maintenance[2]	Total Costs		SRF	Bonds
SUB 3 5. Ten Mile Canal	16 wells and pumping station	8.6	1.6	0.31	1.8	15.4	3.1	18.5	12.0	100%	0%
SUB 3 3. GES/Fiesta Village/ Ft. Myers Beach	7 wells and pumping station	3.8	1.2	0.14	0.9	7.5	1.4	9.0	5.0	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	2.78	0.0	3.5	0.0	3.5	0.0	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.15	0.0	0.0	0.0	100%	0%
Subregion Totals		12.4	2.8	3.2	2.7	26.6	4.5	30.9	17.0	26.6	0.00

Annualized Costs:

Debt Service		$ 2,063,500
Coverage		515,875
O&M		299,684
Total Cost		$ 2,879,059
Production:		
MGD	17.0	
Days per year	180	
Annual 1000 gallons	3,060,000	
Annual Cost per 1000 gallons		$ 0.94

Worksheet 4A
Irrigation Water Supply Costs
Subregion 3
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		26,600,000
2	Adjustment - 50% Grant Funding/$14M Maximum		0
3	Net Amount of Projects Funded from Loan		26,600,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	798,000
5	Loan Service Fee	2.00%	532,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		1,330,000
9	Capitalized Interest		1,397,000
10	Additional Proceeds		0
11	Principal Amount of Loan		29,327,000
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		2,063,500

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 6,650,000	6,650,000	25.0%	$ 116,000
2	$ 13,300,000	19,950,000	50.0%	466,000
3	$ 6,650,000	26,600,000	25.0%	815,000
4	$ -	26,600,000	0.0%	0
5	$ -	26,600,000	0.0%	0
				$ 1,397,000
	Total Capitalized Interest			$ 1,397,000

	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

Summary of Annual Debt Service:

SRF Loan	$2,063,500
Revenue Bonds	$0
Total	$2,063,500

Table 5
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 4 Summary of Project Costs

Option Description	Itemized Capital Costs ($M)						($M)		Estimated	Financing	
	Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	Operations and Maintenance[2]	Total Costs	Benefit (MGD)	SRF	Bond
SUB 4 4. Cocohatchee River	7 wells and pumping station	3.8	1.2	0.14	0.9	7.5	1.4	9.0	5.0	100%	0%
SUB 4 9. Imperial River	20 wells and pumping station	10.8	2.0	0.39	2.3	19.3	3.8	23.2	15.0	100%	0%
SUB 4 2. North Collier/Pelican Bay/ Bonita Springs	6 wells and pumping station	2.9	1.1	0.12	0.7	6.0	1.2	7.2	4.0	100%	0%
SUB 4 1. Golden Gate Canal - SW 17th Ave.	27 wells and pumping station	14.1	2.2	2.11	2.9	26.6	5.0	31.6	20.0	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	0.4	0.0	0.55	0.0	0.55	0.0	100%	0%
Mine Pits	6 wells	0.4	0.0	0.0	0.0	0.48	0.0	0.48	1.5	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	100%	0%
Surface Water Withdrawals Golden Gate Canal - 17th Ave. (added 10/24/02)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	100%	0%
Subregion Totals		32.0	6.4	3.2	6.8	60.7	11.4	72.0	51.5	60.7	0.0

Annualized Costs:

Debt Service	$ 4,708,700
Coverage	1,177,175
O&M	761,536
Total Cost	$ 6,647,411

Production:

MGD	51.5
Days per year	180
Annual 1000 gal	9,270,000

Annual Cost per 1000 gallons $ 0.72

Worksheet 5A
Irrigation Water Supply Costs
Subregion 4
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		60,700,000
2	Adjustment - 50% Grant Funding/$14M Maximum		0
3	Net Amount of Projects Funded from Loan		60,700,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	1,821,000
5	Loan Service Fee	2.00%	1,214,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		3,035,000
9	Capitalized Interest		3,187,000
10	Additional Proceeds		0
11	Principal Amount of Loan		66,922,000
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		4,708,700

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 15,175,000	15,175,000	25.0%	$ 266,000
2	$ 30,350,000	45,525,000	50.0%	1,062,000
3	$ 15,175,000	60,700,000	25.0%	1,859,000
4	$ -	60,700,000	0.0%	0
5	$ -	60,700,000	0.0%	0
				$ 3,187,000
	Total Capitalized Interest			$ 3,187,000

	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

	Summary of Annual Debt Service:	
33	SRF Loan	$4,708,700
34	Revenue Bonds	$0
35	Total	$4,708,700

Table 6
South Florida Water Management District
Irrigation Water Supply Costs
Subregion 5 Summary of Project Costs

Option Description	Itemized Capital Costs ($M)						($M)		Estimated	Financing	
	Description	Wells	Pumping Station	Pipelines	Engineering/ Supervision	Total Capital	Operations and Maintenance[2]	Total Costs	Benefit (MGD)	SRF	Bond
SUB 5 2. Golden Gate Canal - Airport Road	34 wells and pumping station	16.5	2.3	0.66	3.4	28.5	5.8	34.3	25.0	100%	0%
SUB 5 3. Faka Union Slough	34 wells and pumping station	16.5	2.3	10.17	3.4	40.4	5.8	46.2	25.0	100%	0%
SUB 5 1. Naples/South Collier/Marco	10 wells and pumping station	5.6	1.4	0.20	1.3	10.6	2.1	12.7	7.5	100%	0%
Interconnect	Reuse Interconnect	0.0	0.0	0.21	0.0	0.27	0.0	0.3	0.0	100%	0%
Supplementary Infrastructure		0.0	0.0	0.0	0.0	0.15	0.0	0.0	0.0	100%	0%
Surface Water Withdrawals Goden Gate Canal - Airport/Livingston (added 10-24-02)		0.0	0.0	0.00	0.0	0.0	0.0	0.0	8.2	100%	0%
Surface Water Withdrawals Faka Union Canal (added 10-24-02)		0.0	0.0	0.00	0.0	0.0	0.0	0.0	6.4	100%	0%
Subregion Totals		38.6	6.0	11.2	8.0	80.0	13.6	93.5	72.1	80.0	0.0

Annualized Costs:

Debt Service		$ 6,205,800
Coverage		1,551,450
O&M		909,129
Total Cost		$ 8,666,379
Production:		
MGD	72.1	
Days per year	180	
Annual 1000 gallons	12,978,000	
Cost per 1000 gallons		$ 0.67

Worksheet 6A
Irrigation Water Supply Costs
Subregion 5
Financing Assumptions

Line No.	Description	Percent	Amount
	SRF Loan		
1	Total Projects Funded		80,000,000
2	Adjustment - 50% Grant Funding/$14M Maximum		0
3	Net Amount of Projects Funded from Loan		80,000,000
	Issuance and Surety Costs		
4	Loan Repayment Reserve	3.00%	2,400,000
5	Loan Service Fee	2.00%	1,600,000
6	Surety Costs (%)	0.00%	0
7	Underwriters Discount	0.00%	0
8	Total Issuance Costs		4,000,000
9	Capitalized Interest		4,200,000
10	Additional Proceeds		0
11	Principal Amount of Loan		88,200,000
	Level Debt Service Payment:		
12	Term-Years		20
13	Avg. Interest Rate		3.50%
14	First Year of Amortization		4
15	% First Year Payment		100.00%
16	Average Annual Payment		6,205,800

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ 20,000,000	20,000,000	25.0%	$ 350,000
2	$ 40,000,000	60,000,000	50.0%	1,400,000
3	$ 20,000,000	80,000,000	25.0%	2,450,000
4	$ -	80,000,000	0.0%	0
5	$ -	80,000,000	0.0%	0
				$ 4,200,000
	Total Capitalized Interest			$ 4,200,000

	Revenue Bonds		
17	Total Projects Funded		0
18	Adjustment		0
19	Net Amount of Projects Funded from Loan		0
	Issuance and Surety Costs		
20	Issuance Costs (%)	0.50%	0
21	Underwriters Discount	0.50%	0
22	Bond Insurance Premium	0.30%	0
23	Surety Costs (%)	3.00%	0
24	Total Issuance Costs		0
25	Capitalized Interest		0
26	Additional Proceeds		0
27	Principal Amount of Loan		0
	Level Debt Service Payment:		
28	Term-Years		30
29	Avg. Interest Rate		5.50%
30	First Year of Amortization		1
31	% First Year Payment		100.00%
32	Average Annual Payment		0

Loan Cap Int. Calculation

Fiscal Year	Annual Principal Draw	Cumulative Balance	% Total	Annual Interest
1	$ -	0	0.0%	$ -
2	$ -	0	0.0%	0
3	$ -	0	0.0%	0
4	$ -	0	0.0%	0
5	$ -	0	0.0%	0
				$ -
	Total Capitalized Interest			$ -

	Summary of Annual Debt Service:		
33	SRF Loan		$6,205,800
34	Revenue Bonds		$0
35	Total		$6,205,800