South Florida Water, Wastewater, and Stormwater Facilities Study

FINAL REPORT

SFWMD Project #C-15798

JUNE 2005

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The South Florida Water Management District
Florida Department of Environmental Protection
Miami-Dade County Water and Sewer Department
Broward County Office of Water Management, Water Resource Division
Monroe County Division of Growth Management, Office of Marine Resources
City of Coral Springs
City of Cooper City
City of Dania Beach
Town of Davie
City of Deerfield Beach
City of Fort Lauderdale
City of Hallandale Beach
City of Hillsboro Beach
City of Hollywood
City of Lauderhill
City of Margate
City of Miramar
City of Pembroke Pines
City of Plantation
City of Pompano Beach
City of Sunrise
City of Tamarac
Coral Springs Improvement District
North Springs Improvement District
Ferncrest Utilities
City of Florida City
City of Homestead
City of North Miami
City of North Miami Beach
Florida Keys Aqueduct Authority (FKAA)
Lee County, Florida
City of San Diego, California
Dakota County, Minnesota
Clay Township, Indiana

Miami-Dade County Water and Sewer Department, *Wastewater Facilities Master Plan*, October 2003.

Miami-Dade County Water and Sewer Department, *Water Facilities Master Plan, Volume I,* September 2003.

Wastewater Facilities Plan With Phased Implementation for the Marathon Area of the Florida Keys. Prepared for Monroe County by CH2MHILL, June 1998.

Local Government Financial Information Handbook, 2004 Edition, prepared by the Florida Legislative Committee on Intergovernmental Relations (LCIR) with the assistance of the Florida Department of Revenue's Office of Research and Analysis, May 2005.

SOURCES (Cont.)

Capital Project Financing Mechanisms, Prepared by Michael Richardson & Associates, December 1, 2000.

Southeast Michigan Council of Governments, "Investing in Southeast Michigan's Quality of Life: Infrastructure Needs." April 2001.

South Florida Water Management District, *Surface Water Management Design Aids.*

An Atlas of Eastern Broward County Surface Water Management Basins, South Florida Water Management District. November 1987.

An Atlas of Eastern Dade County Surface Water Management Basins, South Florida Water Management District. October 1987..

I. OVERVIEW OF PROJECT

The objective of this study is to create a database of water, wastewater, and stormwater facilities in Broward, Miami-Dade, and Monroe counties that will provide local governments, the Water Management District, utilities, and others with consistent data on the availability of these resources. It will also allow them to better coordinate service areas and capacity with current and future demand due to future growth in the Region. Local governments and others will be able to use this database to answer questions they may have regarding the utilities and services they must provide in order to address the needs of their community given future development goals.

Existing data was collected from multiple sources to create a region-wide picture of the available capacity of facilities in South Florida. All the data that was collected was compiled into one source. From this, local governments and agencies can make better decisions regarding growth and the provision of future facilities within the Region.

There are many uses for the Capital Facilities database within the Regional Planning Council. Some of these uses include:

- Evaluation of development proposals
- Evaluation and Appraisal Reports (EAR)
- Annual Capital Facilities update
- Comprehensive Plan amendments

II. OVERVIEW OF TASKS

Task 1a – Identification of existing water, wastewater, and stormwater facilities in Miami-Dade, Broward, and Monroe Counties.

Task 1b – Establish project baselines for regional population and growth.

Task 2 – GIS Mapping of identified water, wastewater, and stormwater facilities in Miami-Dade, Broward, and Monroe Counties.

Task 3 - GIS mapping of water, wastewater, and stormwater facility service areas in Miami-Dade, Broward, and Monroe Counties.

Task 4 – Identification of existing and planned capacity for water, wastewater, and stormwater facilities in Miami-Dade, Broward, and Monroe Counties.

Task 5 – Identification of existing backlog and service deficiencies for water and sewer facility, and stormwater capacity within the Region.

Task 6 – Estimation of future demand for Water, Sewer, and Stormwater treatment in Miami-Dade, Broward, and Monroe Counties.

Task 7 – Estimation of future costs for needed expansions in Water, Sewer, and Stormwater Treatment facilities in Miami-Dade, Broward, and Monroe Counties.

Task 8 – Evaluate the data collected in tasks 1 – 7 to recommend funding options and strategies to achieve and maintain the resources needed to sustain the future needs.

III. TASK 1 - INVENTORY OF EXISTING FACILITIES AND BASELINE DATA

A. Identification of Water, Wastewater, and Stormwater Facilities in Broward, Miami-Dade, and Monroe Counties

Prior to this study, no complete inventory of water, wastewater, and stormwater facilities existed for the South Florida region. Various agencies had portions of the data, but differences existed between the various sources.

The purpose of this study was to compile a comprehensive list and identify the locations of all water, wastewater, and stormwater facilities in the three county Region. In order to identify all the water and wastewater facilities in the Region, those facilities listed in the County Comprehensive plans were compared to a list of Florida Department of Environmental Protection (DEP) permitted facilities and with local governments. Once these were identified, a survey was sent to each facility to verify that they were still active or that new facilities had not been missed from existing data sources.

1. WATER TREATMENT PLANTS

a. Broward County

There are twenty-seven regional water treatment plants identified in Broward County. They are: Broward County 1A Water Treatment Plant, Broward County 2A Water Treatment Plant, the City of Coral Springs, the City of Dania Beach Water Treatment Plant, the City of Hallandale Beach, Cooper City Utilities, Hollywood Water Treatment Plant, Sawgrass Water Treatment Plant (Sunrise #3), Springtree Water Treatment Plant (Sunrise #1), Southwest (S. Broward) Water Treatment Plant, Park City Water Treatment Plant (Sunrise #2), Fiveash Water Plant (Fort Lauderdale), City of Margate Water Treatment Plant, Ferncrest Utilities, Pompano Beach Water Treatment Plant, City of Tamarac Utilities West, Deerfield Beach East and West Water Plants, Miramar West Water Plant, Coral Springs Improvement District, North Springs Improvement District, Davie Water Treatment Plants I and III, the City of Lauderhill, Pembroke Pines Water Treatment Plant #2, and Plantation East and Central Water Treatment Plants.

Table 1-1 identifies the water treatment plants by their plant permit number and their Florida Department of Environmental Protection facility ID, and gives the address of each water facility plant. Map 1-1 shows the location of each water treatment plant as well as the service area boundary of each utility.

Table 1-1: Broward County Water Treatment Plant (WTP) Locations

Plant Permit #	DEP Facility ID	Plant Name	Address	City
06-58-00009	4060167	Broward County 1A Water Treatment Plant	3701 North State Road 7	Lauderdale Lakes
06-58-00010	4060163	Broward County 2A Water Treatment Plant	1390 N.E. 50th Street	Pompano Beach
4060209	4060209	City of Coral Springs	3800 N.W. 85th Ave.	Coral Springs
4060253	4060253	City of Dania Beach Water Treatment Plant	1201 Stirling Road	Dania Beach
FL4060573	4060573	City of Hallandale Beach	215 N.W. 6th Ave.	Hallandale Beach
FL4060787	4060787	City of Lauderhill	2101 N.W. 49th Ave.	Lauderhill
06-58-00059	4060845	City of Margate Water Treatment Plant	1001 West River Drive	Margate
4061429	4061429	City of Tamarac Utilities West	7805 N.W. 61st Street	Tamarac
4060282	4060282	Cooper City Utilities	11791 S.W. 49th Street	Cooper City
4060291	4060291	Coral Springs Improvement District	10300 N.W. 11th Manor	Coral Springs
06-58-00027	4060344	Davie Water Treatment Plant System I	3790 S.W. 64th Ave.	Davie
06-58-00028	4060344	Davie Water Treatment Plant System III	3500 N.W. 76th Ave.	Hollywood
4060254	4060254	Deerfield Beach East Water Plant	101 N.W. 2nd Ave.	Deerfield Beach
4060254	4060254	Deerfield Beach West Water Plant	290 Goolsby	Deerfield Beach
4060419	4060419	Ferncrest Utilities	3015 S.W. 54th Ave.	Fort Lauderdale
FL40604861-01	4060486	Fiveash Water Plant – Fort Lauderdale	1500 S. State Road 7/4321 NW 9th Ave	Fort Lauderdale
4060615	4060615	Hillsboro Beach Water Plant	925 N.E. 36th Street	Pompano Beach
4060642	4060642	Hollywood Water Treatment Plant	3441 Hollywood Blvd.	Hollywood
W11035	4060925	Miramar West Water Plant	2600 S.W. 66th Terrace	Miramar
4064390	4064390	North Springs Improvement District	9700 N.W. 53rd Court	Coral Springs
4061407	4061407	Park City Water Treatment Plant – Sunrise #2	8700 S.W. 19th Place	Fort Lauderdale
4061083	4061083	Pembroke Pines Water Treatment Plant #2	7960 Johnson St.	Pembroke Pines
4061121-01	4061121	Plantation Central Water Treatment Plant	400 N.W. 73rd Ave.	Plantation
4061121-02	N/A	Plantation East Water Treatment Plant	N/A	N/A
06-58-00078	4061129	Pompano Beach Water Treatment Plant	301 N.E. 12th Street	Pompano Beach
4061408	4061408	Sawgrass Water Treatment Plant – Sunrise #3	777 Sawgrass Corporate Parkway	Sunrise
4064326	4064326	Southwest (S. Broward) Water Treatment Plant	15450 Stirling Road	Davie
4061410	4061410	Springtree Water Treatment Plant – Sunrise #1	4350 Springtree Drive	Sunrise

Source: DEP, SFWMD, Broward County, SFRPC

Leave blank for Map 1-1: Broward County Potable Water Service Areas and Treatment Facilities

b. Miami-Dade County

Seven of the eight regional water treatment facilities identified in Miami-Dade County provide water to citizens of the county. They are: Florida City, the City of Homestead, the City of North Miami Winson Water Plant[1], the Norwood Water Plant (North Miami Beach)[2], and the three water plants that are operated by the Miami-Dade Water and Sewer Department (MD WASD), Alexander Orr, Hialeah-Preston and South Miami-Dade[3].

Table 1-2 identifies the water treatment plants by their plant permit number and their DEP Facility ID, and gives the address of each water treatment plant. Map 1-2 shows the location of each water treatment plant as well as the service area boundary of each utility.

Table 1-2: Miami-Dade County WTP Locations

Plant Permit #	DEP Facility ID	Plant Name	Plant Address	City
13-00017-W		Alexander Orr	6800 S.W. 87th Ave.	Miami
13-00046-W	4130645	City of Homestead	505 N.W. 9th St.	Homestead
13-00059-W	PWO-000017	City of N. Miami Winson Water Plant	12100 N.W. 11th Ave.	North Miami
13-00029-W	4130255	Florida City	461 N.W. 6th Ave.	Florida City
13-00037-W		Hialeah-Preston	1100 West 2nd Ave.	Hialeah
13-00060-W	4131618	Norwood Water Plant – N. Miami Beach	19150 N.W. 8th Ave.	Miami Gardens
13-00040-W		South Miami-Dade WTP[4]	11800 S.W. 208th St.	Miami

Source: DEP, SFWMD, Miami-Dade County, SFRPC

[1] City of North Miami receives 50% of its water service from WASD, while the Winson Plant provides the other 50%. The Winson Plant also provides water service to Biscayne Park and parts of Unincorporated Miami-Dade County.

[2] The City of North Miami Beach receives 50% of its water service from WASD, while the Norwood Water Plant provides water to the other 50%. The Norwood Plant also provides water service to Sunny Isles Beach, Miami Gardens, Golden Beach, and Aventura.

[3] The South Miami-Dade Water Treatment Plant is currently under construction. The data provided is the cumulative total of five small plants that the County uses. These plants are: Leisure City WTP, Everglades Labor Camp WTP, Newton WTP, Elevated Tank WTP, and Naranja Lakes WTP. These plants will be non-operational once the South Miami-Dade WTP is completed.

[4] This plant is currently under construction. Five small plants are being used by the county to provide water to residents in South Miami-Dade County until the construction of the plant is complete.

Placeholder for Miami-Dade County Potable Water Service Areas & Treatment Facilities Map

c. Monroe County

Monroe County residents receive their water from the J. Robert Dean Water Treatment Plant, which is located in Florida City. The Florida Keys Aqueduct Authority (FKAA) operates the water treatment plant. Though the water treatment plant is located in Miami-Dade County, it only serves those residents living in Monroe County and the Florida Keys.

Table 1-3 identifies the water treatment plant by its plant permit number and the DEP Facility ID, and gives the address of the plant. Map 1-3 shows the location of the plant and Map 1-4 shows the service areas for FKAA.

Table 1-3: Monroe County WTP Locations

Plant Permit #	DEP Facility ID	Plant Name	Plant Address	City
13-00005-W	4134357	J. Robert Dean Water Treatment Plant - FKAA	S.W 192nd Ave. & 354th Street	Florida City

Source: Florida Keys Aqueduct Authority

Placeholder for Monroe County FDEP Potable water treatment facilities map (1-3)

Placeholder for FKAA service areas map (Map 1-4)

2. WASTEWATER TREATMENT PLANTS

a. Broward County

Each of the fourteen wastewater treatment plants in Broward County operates independently. While Broward County does operate and provide sewer service to many areas, several municipalities operate their own plants. The fourteen wastewater facilities operating in Broward County are: the Town of Davie WWTP, Cooper City Utilities, Hollywood Southern Regional WWTP, Sawgrass Regional WWTF (Sunrise #3), Springtree Regional WWTF (Sunrise #1), South Broward (Southwest) WWTF, Broward County North Regional WWTF, Plantation Regional WWTP, the G.T. Lohmeyer Plant (City of Fort Lauderdale), Coral Springs Improvement District, City of Margate East and West WWTP's, Ferncrest Utilities, and the City of Pembroke Pines WWTF.

Table 1-4 identifies the wastewater treatment plants by their plant permit number, and gives the physical address of each plant. Map 1-5 shows the location of each wastewater treatment plant. Maps 1-6 to 1-16 show the service area boundaries for each facility listed below. There is not a service area map for the entire county that shows the boundaries for each plant.

Table 1-4: Broward County Wastewater Treatment Plant (WWTP) Locatons

Plant Permit #	Plant Name	Address	City
FL0031771	Broward County N. Regional WWTF	2401 N. Powerline Road	Pompano Beach
FLA169617	City of Margate East WWTP	1001 West River Drive	Margate
FL0041289	City of Margate West WWTP	6630 N.W. 9th St.	Margate
FL0040398	Cooper City Utilities	11791 S.W. 49th St.	Cooper City
FLA041301	Coral Springs Improvement District	10300 N.W. 11th Manor	Coral Springs
FLA013583	Ferncrest Utilities, Inc.	3015 S.W. 54th Ave.	Fort Lauderdale
FLA041378	G.T. Lohmeyer Plant – Fort Lauderdale	1765 S.E. 18th St.	Fort Lauderdale
FL0026255	Hollywood Southern Regional WWTP	1621 N. 14th Ave.	Hollywood
FLA13575	Pembroke Pines WWTF	13955 Pines Blvd.	Pembroke Pines
FLA040401	Plantation Regional WWTP	6500 N.W. 11th Place	Plantation
FLA042641	Sawgrass Regional WWTF #3 (Sunrise #3)	14150 N.W. 8th St.	Sunrise
FLA013580	South Broward (Southwest) WWTF	15400 Watermill Road	Davie
FLA041947	Springtree Regional WWTF – Sunrise #1	4350 Springtree Drive	Sunrise
FL0040541	Town of Davie WWTP	3591 N.W. 76th Ave.	Davie

Source: DEP, Broward County, SFRPC

Hold for map 1-5: Broward County Wastewater facilities

Hold for map 1-6: Broward County Sewer Service Areas & City boundaries map

Hold for map 1-7: City of Pembroke Pines Sewer Service Area 2005

Hold for map 1-8: City of Fort Lauderdale Sewer Service Area

Hold for map 1-9: City of Sunrise Water and Wastewater Utilities System

Hold for map 1-10: City of Plantation Utilities Service Area Map

Hold for map 1-11: Ferncrest Utilities Wastewater Service area map

Hold for map 1-12: Coral Springs Improvement District Wastewater Service area

Hold for map 1-13: City of Margate wastewater service area

Hold for map 1-14: Town of Davie Wastewater Service area

Hold for map 1-15: Cooper City Utilities, Wastewater Service Area

Hold for map 1-16: City of Hollywood Wastewater Service area

b. Miami-Dade County

There are four wastewater treatment facilities located in Miami-Dade County. They are the City of Homestead Wastewater Treatment Facility, the Miami-Dade North District Wastewater Treatment Plant, the Miami-Dade Central Wastewater Treatment Plant and the South District Wastewater Treatment Plant. Table 1-5 identifies the wastewater plants by their plant permit number, and gives the physical address of each plant. Map 1-17 shows the location of each plant. Map 1-18 shows the approximate service area boundaries for the three Miami-Dade Water and Sewer Department (WASD) plants.

The City of Homestead Wastewater Treatment Facility provides wastewater service to 10,100 residential and non-residential customers. The three Miami-Dade Water and Sewer Department (WASD) wastewater facilities provide direct sewer service to approximately 315,000 retail customers and thirteen wholesale customers.

Table 1-5: Miami-Dade County WWTP Locations

Plant Permit #	Plant Name	Plant Address	City
FLA 013609	City of Homestead	551 S.E. 8th Street	Homestead
FLA024805	WASD Central District WWTP	Virginia Key	Miami
FL0032182	WASD North District WWTP	N.E. 151st St. and Biscayne Blvd.	Miami
FL0042137	WASD South District WWTP	8950 S.W. 232nd Street	Miami

Source: DEP, Miami-Dade County, City of Homestead, SFRPC

hold for map 1-17: Miami-Dade Wastewater Treatment Facilities

Hold for Map 1-18: Miami-Dade Water and Sewer Department District WWTP Locations and Approximate Service Area Boundaries

c. Monroe County

Monroe County does not have a countywide wastewater treatment system. The residents rely on a variety of different treatment systems. Because there is not a countywide system in place, each developer or homeowner has had to construct private onsite or small package treatment facilities to serve the development or home. The result of this is that there are approximately 23,000 onsite wastewater systems and 246 small wastewater treatment plants throughout the study area[5]. Only two cities, Key West and Key Colony Beach, have large wastewater treatment facilities.

Sources used to gather information on Monroe County wastewater treatment facilities included the comprehensive plans for the Cities of Key West, Islamorada, and Marathon, as well as the *Monroe County Sanitary Wastewater Master Plan* and the *Wastewater Facilities Plan With Phased Implementation for the Marathon Area of the Florida Keys.*

The below information is supplemental to the regional wastewater discussion. This information was not used in the analysis of the wastewater facilities in the Region, nor was it used to determine projected regional wastewater demand.

The five largest treatment plants in the study area, not including the City of Key West (Richard A. Heyman WWTP) and the City of Key Colony Beach, have a combined capacity of 1.75 million gallons per day (mgd) and comprise 35 percent of the total permitted treatment capacity. These plants are identified in Table 1-6.

Table 1-6: Five Largest WWTP's in Monroe County, Excluding Key West and Key Colony Beach

Facility ID	Wastewater Treatment Plant	Permitted Capacity (mgd)
FLA014867	Key Haven Utility	0.200
FLA014705	Monroe County Detention Center	0.105
FLA014951	Key West Resort Utilities	0.499
N/A	U.S. Naval Air Station	0.400
N/A	Ocean Reef Club	0.550
	TOTAL	**1.754**

Source: *Monroe County Sanitary Wastewater Master Plan,* pg. 3-3

The predominant method of wastewater treatment in the Keys is Onsite Wastewater Treatment Systems (OWTS). There are approximately 23,000 of these currently in operation. There are a variety of different types of OWTS's, including cesspools, conventional OWTS, which include septic tanks and drainfields, aerobic treatment units (ATU's), and nutrient reduction systems. Approximately 2,800 cesspools are still in operation throughout the Keys, as well as 640 permitted ATU systems.

An analysis of the wastewater treatment situation in the City of Key West, City of Key Colony Beach, Islamorada, and the City of Marathon is given in Appendix C.

[5] The study area for the Monroe County Sanitary Wastewater Master Plan includes the entire developed area of the Florida Keys with the exception of the cities of Key West and Key Colony Beach.

3. STORMWATER MANAGEMENT SYSTEM

a. Broward County

The Stormwater management system in Broward County is a three-tiered system, the primary canals, the secondary canals and the tertiary systems. The tertiary systems are made up of community lakes/on-site ponds, street and yard grates, swales, ditches, and canals. These are maintained by the neighborhood in which they are located. The secondary system is usually a network of canals, structures, pumping stations and storages areas. These drainage systems can cover large areas and encompass several neighborhoods and communities. Local Drainage Districts, other special taxing districts, or the County/City are responsible for the maintenance and operation of these systems. The Primary Drainage System is a combination of South Florida Water Management District canals, natural rivers, and other waterways, serving nine basins.

PRIMARY CANALS AND BASINS

The independent and dependent districts throughout Broward County operate and control the secondary canal system. These bodies of water flow into what is known as the primary canal system. The primary system is controlled and operated by the South Florida Water Management District. The following information on the primary canals and basin is the from the South Florida Water Management District's *An Atlas of Eastern Broward County Surface Water Management Basins* (November 1987).

The identified primary canals in Broward County are shown on Map 1-20 and a map showing the boundaries of each basin is shown on Map 1-21.

Hillsboro Canal Basin

The Hillsboro Canal basin has an area of approximately 102 square miles and is located in northeastern Broward County (40 square miles) and southeastern Palm Beach County (62 square miles).

C-14 (Cypress Creek Canal) Basin

The C-14 basin has an area of approximately 59 square miles and is located in northeastern Broward County. The C-14 basin is divided into an eastern basin (34 square miles) and a western basin (25 square miles).

Pompano Canal Basin

The Pompano Canal basin has an area of approximately 7.2 square miles and is located in northeastern Broward County.

C-13 (Middle River Canal) Basin

The C-13 basin has an area of approximately 39 square miles and is located in eastern Broward County. The C-13 basin in divided into an eastern basin (9 square miles) and a western basin (30 square miles). The boundary between the basins runs approximately north-south through S-36. A five square mile area north of the eastern C-13 basin drains to the North Fork of the Middle River and is known as the North Fork of the Middle River basin.

C-12 (Plantation Canal) Basin

The C-12 basin has an area of approximately 19 square miles and is located in eastern Broward County.

North New River Canal Basin
The North New River Canal (NNRC) basin has an area of approximately 30 square miles and is located in eastern Broward County. The NNRC basin is divided into an eastern basin (7 square miles) and a western basin (23 square miles).

C-11 (South New River Canal) Basin
The C-11 basin has an area of approximately 104 square miles and is located in south central Broward County. The C-11 basin is divided into a western basin (81 square miles) and an eastern basin (23 square miles).

C-10 (Hollywood Canal) Basin
The C-10 basin has an area of approximately 15 square miles and is located in southeast Broward County. The Project canals in the C-10 basin provide flood protection and drainage for the C-10 basin.

C-9 (Snake Creek Canal) Basin
The C-9 basin has an area of approximately 98 square miles and is located in northeastern Miami-Dade County (39 square miles) and southeastern Broward County (59 square miles). The basin is comprised of two sub-basins, C-9 east (45 square miles) and C-9 west (53 square miles). The boundary between the sub-basins is Flamingo Road in Broward County and N.W. 67th Avenue in Miami-Dade County.

SPECIAL TAXING DISTRICTS

Within Broward County there are seventeen special taxing districts, eleven independent and six dependent, that deal exclusively with water control. There are also two Community Development Districts that were identified by Broward County as having some water control responsibilities. The districts are responsible for operating and maintaining drainage systems within their boundaries. The Broward County Office of Environmental Services, Water Management Division is responsible for the six dependent districts and the unincorporated neighborhoods in the county, which are not within an independent district.

Permitting is done by the independent drainage districts within their boundaries and by Broward County Department of Environmental Protection for areas outside of the independent districts. The South Florida Water Management District (SFWMD) permits larger developments throughout the County.

The boundaries of the following districts are shown on Map 1-22. The Broward County Office of Environmental Services, Water Management Division, provides this map. The lists below are current as of December 2004, while the map is current as of July 1999. Some of the districts that are shown on the map are no longer active, or have been dissolved.

Broward County Independent Districts[6]
Central Broward Water Control District
Coral Springs Improvement District
Hillsboro Inlet District
North Lauderdale Water Control District
North Springs Improvement District

[6] Broward County Office of Environmental Services, Water Management Division; State of Florida Department of Community Affairs, Special District Information Program

Old Plantation Water Control District
Pine Tree Water Control District
Plantation Acres Improvement District
South Broward Drainage District
Sunshine Water Control District
Tindall Hammock Irrigation and Soil Conservation District
Indian Trace Community Development District
Turtle Run Community Development District

Broward County Dependent Districts
Cocomar Water Control District
Lauderdale Isles Water Management District
Twin Lakes Water Control District
Water Control District #2
Water Control District #3
Water Control District #4

Hold for map 1-20:Broward County Primary and Secondary Canals

Hold for Map 1-21: Broward County Drainage Basins

Hold for map 1-22: Broward County Drainage Districts

b. Miami-Dade County

Primary Canal System

There are seventeen primary canals that serve as the water management or stormwater management system for Miami-Dade County. Information on the primary canals and basin in Miami-Dade County is from the South Florida Water Management District's *An Atlas of Eastern Dade County Surface Water Management Basins* (October, 1987).

The primary canals and the basins in Miami-Dade County are shown on Map 1-23 and a map showing the boundaries of each basin is shown on Map 1-24.

C-9 (Snake Creek Canal) Basin
The C-9 basin has an area of approximately 98 square miles and is located in northeastern Miami-Dade County (39 square miles) and southeastern Broward County (59 square miles). The basin is comprised of two sub-basins, C-9 East (52 square miles) and C-9 West (45 square miles). The boundary between the sub-basins is Flamingo Road in Broward County and N.W. 67th Ave. in Miami-Dade County.

C-8 (Biscayne Canal) Basin
The C-8 basin has an area of approximately 31.5 square miles and is located in northeastern Miami-Dade County. C-8 begins in the east borrow of the Palmetto Expressway at the northwest corner of the Miami Lakes subdivision. Flow in the canal is to the east with discharge via S-28 to Biscayne Bay just south of the municipal boundary between Miami Shores and Biscayne Park.

C-7 (Little River Canal) Basin
The C-7 basin has an area of approximately 35 square miles and is located in northeastern Miami-Dade County.

C-6 (Miami Canal) Basin
The C-6 basin has an area of approximately 69 square miles and is located in eastern Miami-Dade County. The C-6 begins at S-31 at the intersection of L-30 and L-33 just west of State Road 27. Flow in the canal is to the southeast with discharge via S-26 to Biscayne Bay just north of U.S. Highway 41.

C-4 (Tamiami Canal) Basin
The C-4 basin has an area of approximately 60.9 square miles and is located in eastern Miami-Dade County.

C-5 (Comfort Canal) Basin
The C-5 basin has an area of 2.3 square miles and is located in eastern Miami-Dade County.

C-3 (Coral Gables Canal) Basin
The C-3 basin has an area of approximately 18 square miles and is located in eastern Miami-Dade County.

C-2 (Snapper Creek Canal) Basin
The C-2 basin has an area of approximately 53 square miles and is located in eastern Miami-Dade County.

C-100 Basin
The C-100 basin has an area of approximately 40.6 square miles and is located in eastern Miami-Dade County. The basin is also known as the Cutler Drainage Basin.

C-1 (Black Creek Canal) Basin
The C-1 basin has an area of approximately 56.9 square miles and is located in southeastern Miami-Dade County.

C-102 Basin
The C-102 basin has an area of approximately 25.4 square miles and is located in southeastern Miami-Dade County.

C-103 Basin
The C-103 basin has an area of approximately 40.6 square miles and is located in southeast Miami-Dade County.

North Canal, Florida City Canal, Model Land, and Homestead Air Force Base Basin
The area occupied by the Homestead Air Force Base, and the area south of the C-103 basin, east of Old Dixie Highway, and Card Sound Road, and west and north of L-31E is drained by five existing Miami-Dade County canals: The five canals are:

1. The Military Canal which drains the 4.7 square miles of the Homestead Air Force Base
2. The North Canal which drains 7.8 square miles
3. The Florida City Canal which drains 12.5 square miles
4. The North Model Land Canal, and
5. The South Model Land Canal, which together drain 28.1 square miles.

C-111 Basin
The C-111 basin has an area of approximately 100 square miles and is located in southern Miami-Dade County.

Hold for Map 1-23: Miami-Dade County Primary and Secondary Canals

Hold for Map 1-24: Miami-Dade County Drainage Basins

B. BASELINE DATA

Project baselines for regional population and growth were established in 5-year increments, from 2005 to 2030. Population projections from three different sources were used in the study. They are: USACE, Municipal and Industrial (M&I) Water Use Forecast, Initial CERP Update (August 2003), University of Florida, Bureau of Economic and Business Research (BEBR) (February 2004) – Medium Projection, and population projections by each of the three counties. Table 1-11 shows the CERP projections, Table 1-12 shows the BEBR projections, and Table 1-13 shows each county's projections.

Table 1-11: CERP Population Projections

	2005	2010	2015	2020	2025	2030
Broward	1,772,800	1,931,600	2,092,300	2,257,100	2,416,900	2,562,900
Miami-Dade	2,403,200	2,554,300	2,706,500	2,862,000	3,011,900	3,148,100
Monroe	81,300	82,200	83,100	84,100	85,000	85,800
Regional Total	4,257,300	4,568,100	4,881,900	5,203,200	5,513,800	5,796,800

Source: CERP, 08/03

Table 1-12: BEBR Population Projections

	2005	2010	2015	2020	2025	2030
Broward	1,785,700	1,949,400	2,117,300	2,289,900	2,458,200	2,612,700
Miami-Dade	2,405,100	2,557,100	2,712,100	2,870,600	3,024,200	3,164,300
Monroe	80,300	81,100	81,800	82,600	83,300	84,000
Regional Total	4,271,100	4,587,600	4,911,200	5,243,100	5,565,700	5,861,000

Source: BEBR, 02/04

Table 1-13: County Population Projections

	2005	2010	2015	2020	2025	2030
Broward (June 2002)	1,789,916	1,954,572	2,117,038	2,273,287	2,418,641	2,548,303
Miami-Dade (July 2004)	2,402,117	2,551,284	2,703,117	2,858,184	3,019,787	3,187,776
Monroe (1999)	88,305	90,236	90,654	N/A	N/A	N/A
Regional Total	4,280,338	4,596,092	4,910,809	5,131,471	5,438,428	5,736,079

Source: Broward County, Miami-Dade County, and Monroe County

Table 1-14 shows the 2004 populations that were used in the study. The source for these numbers is the University of Florida, Bureau of Economic and Business Research (BEBR).

Table 1-14: 2004 BEBR County Populations

	2004 Population
Broward	1,723,131
Miami-Dade	2,379,818
Monroe	81,236
Regional Total	4,184,185

Source: BEBR, 2004

IV. TASK 4 – CAPACITY ANALYSIS

To verify the existing capacity of all identified water and sewer treatment plants and stormwater facilities, a survey was sent out to all identified water and wastewater treatment plants. Please see Appendix B for the survey and additional survey information for each identified facility.

A. WATER TREATMENT PLANTS

1. The Region

There are thirty-five water treatment facilities in Broward, Miami-Dade, and Monroe Counties. Together, these facilities provide clean, potable water to nearly 4 million people throughout the Region. Of the thirty-five facilities, twenty-seven are located in Broward County, and eight are located in Miami-Dade County, including the Florida Keys Aqueduct Authority, which provides potable water to Monroe County residents.

The design capacity of the thirty-five facilities is 1013.146 million gallons a day (mgd), while the total permitted capacity is 889.634 mgd. During times of maximum day demand, 755.209 mgd are being distributed throughout the Region. This demand represents 84.9% of the total permitted capacity of the facilities. The annual average demand for water at the Region's facilities totals 639.896 mgd, which represents 71.9% of the total permitted capacity.

Based on the information gathered from the Infrastructure Survey, an additional 158.26 mgd of capacity will be added to these facilities by 2025. This will bring the total capacity in the Region to 1171.406[7] mgd. Water capacity, by county, is shown in Table 4-1.

Table 4-1: Regional WTP Capacity

PLANT NAME	DESIGN CAPACITY (MGD)	PERMITTED CAPACITY (MGD)	PEAK FLOW (MGD)	AVG. ANNUAL DAILY FLOW (MGD)	ADDITIONAL CAPACITY (MGD)
Broward County	490.646	415.944	319.005	241.984	37.0
Miami-Dade County	500.50	453.76	412.404	380.312	111.26
Monroe County	22.0	19.93	23.8	17.6	10.0
Region Total	**1013.146**	**889.634**	**755.209**	**639.896**	**158.260**

Source: SFRPC, Broward County, Miami-Dade County, FKAA

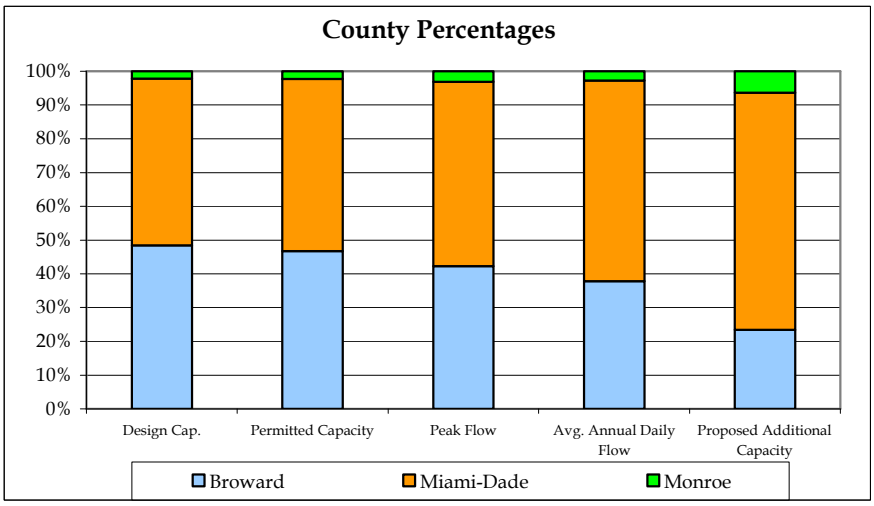
The twenty-seven facilities in Broward County account for 48.4% of the total design capacity in the Region, while they account for 46.8% of the total permitted capacity in the Region. Miami-Dade County accounts for 49.4% of the Region's design capacity, and 51.0% of the permitted capacity, while Monroe County accounts for 2.2% of both the design and permitted capacities.

Broward County accounts for 42.2% of the maximum day demand in the Region, while Miami-Dade County accounts for 54.6% and Monroe County 3.2% of the maximum day demand. The breakdown of average annual daily demand is: Broward County, 37.8%; Miami-Dade County, 59.4%; and Monroe County, 2.8%.

[7] The total capacity is the current design capacity plus the known capacity increases in each county.

Of the 158.26 mgd of additional capacity that will be added in the Region in the next 25 years, 23.4% of it will be added in Broward County, 70.3% in Miami-Dade County, and 6.3% in Monroe County. Figure 4-1 shows this information graphically.

Figure 4-1: Region-wide Water Capacity, by County



Source: SFRPC

2. Broward County

There are twenty-seven water treatment facilities located in Broward County. They are: Broward County 1A Water Treatment Plant, Broward County 2A Water Treatment Plant, the City of Coral Springs, the City of Dania Beach Water Treatment Plant, the City of Hallandale Beach, Cooper City Utilities, Hollywood Water Treatment Plant, Sawgrass Water Treatment Plant (Sunrise #3), Springtree Water Treatment Plant (Sunrise #1), Southwest (S. Broward) Water Treatment Plant, Park City Water Treatment Plant (Sunrise #2), Fiveash Water Plant (Fort Lauderdale), City of Margate Water Treatment Plant, Ferncrest Utilities, Pompano Beach Water Treatment Plant, City of Tamarac Utilities West, Deerfield Beach East and West Water Plants, Miramar West Water Plant, Coral Springs Improvement District, North Springs Improvement District, Davie Water Treatment Plants I and III, the City of Lauderhill, Pembroke Pines Water Treatment Plant #2, and Plantation East and Central Water Treatment Plants. The locations of these facilities are shown in the Broward County Potable Water Service Areas and Treatment Facilities Map (Map 1-1) as well as in Table 1-1.

The total permitted capacity for the facilities located in Broward County totals 415.944 mgd, while the design capacity totals 490.646 mgd. During maximum day demand, 319.005 mgd are being used, representing 76.7% of permitted capacity. The annual average demand for treated water in Broward County is 241.984 mgd, which is 58.2% of permitted capacity.

Eight of the twenty-seven facilities reported that additional capacity will be added. These additions will add 37.0 mgd of capacity to the County, bringing the permitted capacity up to 452.944 mgd. It is expected that these expansion projects will be completed by 2008. See Table 4-2 for information on each individual plant.

These twenty-seven facilities provide water service to more than 1.3 million people per day. The largest providers in the county are Broward County, the City of Hollywood, Sunrise Water Treatment Plants, and the Fiveash Water Plant in Fort Lauderdale.

Table 4-2: Broward County WTP Capacities

PLANT NAME	DESIGN CAPACITY (MGD)	PERMITTED CAPACITY (MGD)	PEAK FLOW (MGD)	AVG. ANNUAL DAILY FLOW (MGD)	ADDITIONAL CAPACITY (MGD) & Year
Broward County 1A WTP	16.0	16.0	9.0	8.3	None Reported
Broward County 2A WTP	40.0	30.0	17.4	15.4	None Reported
City of Coral Springs	16.0	16.0	10.3	8.4	None Reported
City of Dania Beach WTP	3.0	4.0	3.394	2.789	4.5 – 2007
City of Hallandale Beach	10.0	10.0	7.0	5.8	6.0 - 2006
Cooper City Utilities	7.0	7.0	5.7	2.89	None Reported
Hollywood WTP	61.0	57.5	32.8	26.0	None Reported
Sawgrass WTP – Sunrise #3	18.0	18.0	12.2	8.79	6.0 – 2006
Springtree WTP – Sunrise #1	24.0	24.0	22.7	17.92	4.0 – 2006
Southwest WTP (S. Broward)	2.0	2.0	1.88	0.54	None Reported
Park City WTP (Sunrise #2)	6.0	6.0	5.53	2.9	None Reported
Fiveash Water Plant	75.0	67.3	57.1	42.5	None Reported
Hillsboro Beach Water Plant	2.016	1.0	1.3	1.09	None Reported
City of Margate WTP	18.0	13.51	9.077	6.991	None Reported
Ferncrest Utilities	1.0	1.0	0.874	0.768	None Reported
Pompano Beach WTP	50.0	24.0	21.9	17.2	None Reported
City of Tamarac Utilities West	20.0	8.3	13.07	6.441	None Reported
Deerfield Beach West WP	18.0	18.0	14.9	12.6	3.5 – 2008
Deerfield Beach East WP	16.8	16.8	7.9	2.0	
Miramar West Water Plant	7.5	7.5	6.5	5.8	3.0 – 2007
Coral Springs Improvement District	7.12	5.75	5.45	4.226	None Reported
North Springs Improvement District	6.81	6.5474	5.41	4.11	None Reported
Davie WTP System I	3.4	3.4	1.193	0.951	None Reported
Davie WTP System III	4.0	4.0	3.57	3.41	4.0 – 2006
City of Lauderhill	16.0	8.137	8.581	6.859	None Reported
Pembroke Pines WTP #2	18.0	16.2	15.5	13.5	6.0 – 2005-2007
Plantation Central WTP	12.0	12.0	10.564	7.041	None Reported
Plantation East WTP	12.0	12.0	8.212	6.768	None Reported
County Total	**490.646**	**415.944**	**319.005**	**241.984**	**37.0 by 2008**

Sources: Broward County, City of Coral Springs, Dania Beach WTP, City of Hallandale Beach, Cooper City Utilities, Hollywood WTP, City of Sunrise, City of Fort Lauderdale, Hillsboro Beach Water Plant, City of Margate, Ferncrest Utilities, Pompano Beach WTP, City of Tamarac Utilities, Deerfield Beach, Miramar, Coral Springs Improvement District, North Springs Improvement District, Town of Davie, City of Lauderhill, Pembroke Pines, and City of Plantation

3. Miami-Dade County

Seven of the eight water treatment facilities located in Miami-Dade County provide water to citizens of the county. They are: Florida City, the City of Homestead, the City of North Miami Winson Water Plant[8], the Norwood Water Plant (North Miami Beach)[9], and the three water plants that are operated by the Miami-Dade Water and Sewer Department (MD WASD): Alexander Orr, Hialeah-Preston and South Miami-Dade[10]. The locations of these facilities are shown in the Miami-Dade County Potable Water Service Areas and Treatment Facilities Map (Map 1-2) as well as in Table 1-2.

The total design capacity of the seven facilities that serve Miami-Dade County is 500.50 million gallons per day (mgd), while the total permitted capacity is 453.76 mgd. The peak demand for water in Miami-Dade is 412.404 mgd, which represents 90.9% of the total permitted capacity. The annual average demand for water is 380.312 mgd, which represents 83.8% of the permitted capacity. Five of the seven facilities report that additional capacity will be added to their facilities. These additions will add 111.26 mgd of water capacity. This will bring the total permitted capacity in Miami-Dade County to 565.02 mgd. See Table 4-3 for details on each individual plant.

The seven facilities provide water to the entire population of Miami-Dade County through 474,042 service connections. The largest provider in the County is the Miami-Dade Water and Sewer Department, which provides service to 410,000 retail customers and fifteen wholesale customers.[11]

[8] City of North Miami receives 50% of its water service from WASD, while the Winson Plant provides the other 50%. The Winson Plant also provides water service to Biscayne Park and parts of Unincorporated Miami-Dade County.

[9] The City of North Miami Beach receives 50% of its water service from WASD, while the Norwood Water Plant provides water to the other 50%. The Norwood Plant also provides water service to Sunny Isles Beach, Miami Gardens, Golden Beach, and Aventura.

[10] The South Miami-Dade Water Treatment Plant is currently under construction. The data provided is the cumulative total of five small plants that the County uses. These plants are: Leisure City WTP, Everglades Labor Camp WTP, Newton WTP, Elevated Tank WTP, and Naranja Lakes WTP. These plants will be non-operational once the South Miami-Dade WTP is completed.

[11] The fifteen wholesale customers are: Hialeah, Miami Beach, North Miami Beach, North Miami, Opa-Locka, Miami Springs, Hialeah Gardens, Bal Harbour, North Bay Village, Medley, Bay Harbor Islands, Surfside, West Miami, Indian Creek Village, and Virginia Gardens.

Table 4-3: Miami-Dade County WTP Capacities

PLANT NAME	DESIGN CAPACITY (MGD)	PERMITTED CAPACITY (MGD)	PEAK FLOW (MGD)	AVG. ANNUAL DAILY FLOW (MGD)	ADDITIONAL CAPACITY (MGD) & Year
Florida City	4.03	3.51	3.604	2.983	None Reported
City of Homestead	16.7	11.7	10.9	8.499	5.0 – 2008
North Miami Beach Norwood Water Plant	16.0	16.0	16.0	15.5	16.0 – 2006
North Miami Winson Water Plant	9.0	9.3	10.0	8.5	None Reported
South Miami Dade	12.03	10.95	8.8	6.8	20.0 – 2006
Alexander Orr	217.74	203.11	185.5	171.93	60.26 – 2013
Hialeah-Preston	225.0	199.19	177.6	166.1	10.0 – 2005
County Total	**500.50**	**453.76**	**412.404**	**380.312**	**111.26 by 2013**

Sources: FL DEP, City of Florida City, City of Homestead, City of North Miami Beach, City of North Miami, and MD WASD.

4. Monroe County

Monroe County residents receive their water from the J. Robert Dean Water Treatment Plant that is operated by the Florida Keys Aqueduct Authority. Though the plant is located in Miami-Dade County, it only serves those residents living in Monroe County and the Florida Keys. The location of the facility is shown on the Monroe County FDEP Potable Water Treatment Facility Map (Map 1-3) as well as in Table 1-3. Table 4-4 shows capacity information for the plant.

The permitted capacity for this facility is 19.93 mgd, while the design capacity is 22.0 mgd. During times of peak demand, the plant is running above capacity, at 23.8 mgd, which is 119.4% of the permitted capacity. The annual average daily demand for water is 17.6 mgd, which is 88.3% of the permitted capacity. The facility reports that an additional 10.0 mgd of capacity will be added to the plant by 2025. This will bring the total permitted capacity to 29.93 mgd.

The J. Robert Dean Water Treatment Plant reports having 40,000 residential connections and 5,000 non-residential connections.

Table 4-4: Monroe County WTP Capacity

PLANT NAME	DESIGN CAPACITY (MGD)	PERMITTED CAPACITY (MGD)	PEAK FLOW (MGD)	AVG. ANNUAL DAILY FLOW (MGD)	ADDITIONAL CAPACITY (MGD) & Year
J. Robert Dean Water Treatment Plant	22.0	19.93	23.8	17.6	10.0 - 2025

Source: Florida Keys Aqueduct Authority (FKAA)

B. WASTEWATER TREATMENT PLANTS

1. The Region

Seventeen wastewater facilities have been identified in the Region. Of these, four are in Miami-Dade County and thirteen are in Broward County. The total wastewater design capacity in the Region is 649.62 million gallons per day (mgd). The total permitted capacity is slightly less, at 645.16 mgd. The peak demand in the region is 750.493 mgd. Currently, during peak demand, 116.3% of the permitted capacity in the Region is being used. The average annual daily flow in the Region is 484.323 mgd, which represents 75.1% of the permitted capacity.

An additional 89.5 mgd of capacity is scheduled to be added to the Region by 2009. This will bring the total capacity in the Region to 739.12 mgd. Table 4-5 provides a breakdown of the data by county.

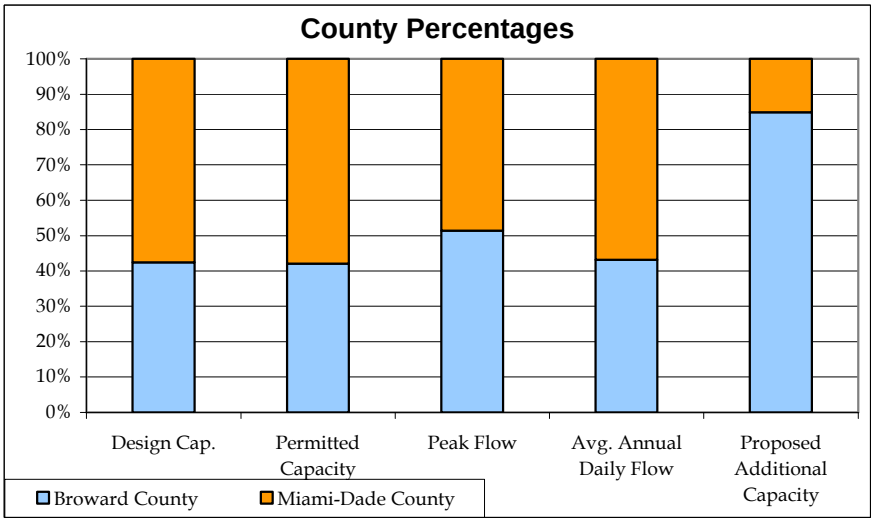
Table 4-5: Regional WWTP Capacities

PLANT NAME	DESIGN CAPACITY (MGD)	PERMITTED CAPACITY (MGD)	PEAK FLOW (MGD)	AVG. ANNUAL DAILY FLOW (MGD)	ADDITIONAL CAPACITY (MGD)
Miami-Dade County	374.0	374.0	364.52	275.0	13.5
Broward County	275.62	271.16	385.973	209.3233	76.0
Region Total	**649.62**	**645.16**	**750.493**	**484.323**	**89.5**

Source: SFRPC, Broward County, Miami-Dade County

The thirteen-wastewater treatment plants in Broward County account for 42.4% of the total Regional design capacity and 42.0% of the total Regional permitted capacity. The four facilities in Miami-Dade County account for the remainder of the capacity in the Region. Figure 4-2 shows the breakdown by county for each of the categories in Table 4-5.

Figure 4-2: Regional-wide Wastewater Capacity, by County



Source: SFRPC

2. Broward County

There is no centralized wastewater system in Broward County. While Broward County does operate and provide sewer service to many areas, several municipalities operate their own plants. The wastewater facilities operating in Broward County are: the Town of Davie WWTP, Cooper City Utilities, Hollywood Southern Regional WWTP, Sawgrass Regional WWTF (Sunrise #3), Springtree Regional WWTF (Sunrise #1), South Broward (Southwest) WWTF, Broward County North Regional WWTF, Plantation Regional WWTP, the G.T. Lohmeyer Plant (City of Fort Lauderdale), Coral Springs Improvement District, City of Margate East and West WWTP's, Ferncrest Utilities, Pompano Beach Treated Wastewater Effluent Irrigation Facility, and the City of Pembroke Pines WWTF. The locations of these facilities are shown in the Broward County Wastewater Treatment Facilities Map (Map 1-5) as well as in Table 1-4.

The total wastewater permitted capacity in Broward County is 275.62 mgd. The average annual daily demand, 209.323 mgd, represents 77.2% of the permitted capacity, while the peak demand, 385.973 mgd, represents 142.3% of the capacity. The breakdown for each facility is shown in Table 4-6. Additional facility information is shown in Appendix B.

A total of 76.0 mgd of additional capacity will be added to four facilities by 2007. The Broward County N. Regional WWTF reports it will be adding 20.0 MGD by 2006. An additional 2.0 mgd will be added to the Davie WWTP by 2007 and the Hollywood Southern Regional WWTP will be adding 54.0 mgd by 2006. These additions will bring the total permitted capacity in Broward County to 351.62 mgd.

Table 4-6: Broward County WWTP Capacities

PLANT NAME	DESIGN CAPACITY (MGD)	PERMITTED CAPACITY (MGD)	PEAK FLOW (MGD)	AVG. ANNUAL DAILY FLOW (MGD)	ADDITIONAL CAPACITY (MGD) &Year
Broward County N. Regional WWTF	84.0	80.0	144.78	69.83	20.0 – 2006
Cooper City Utilities	3.75	3.44	4.27	2.7	None Reported
Coral Springs Improvement District	8.33	8.33	7.06	5.01	None Reported
Davie WWTP	5.0	4.85	3.83	3.2	2.0 – 2007
Ferncrest Utilities	0.6	0.6	0.95	0.48	None Reported
G.T. Lohmeyer Plant	55.7	55.7	85.312	34.493	None Reported
Hollywood Southern Regional WWTP	48.75	48.75	49.9	42.5	54.0 – 2006
Margate East & West WWTP	10.1	10.1	11.8	6.42	None Reported
Pembroke Pines WWTF	9.5	9.5	8.811	6.5503	None Reported
Plantation Regional WWTF	18.9	18.9	30.0	17.5	None Reported
South Broward WWTF	0.99	0.99	1.66	0.47	None Reported
Sunrise #1 (Springtree)	10.0	10.0	15.0	8.2	None Reported
Sunrise #3 (Sawgrass)	20.0	20.0	22.6	11.97	None Reported
County Total	**275.62**	**271.16**	**385.973**	**209.323**	**76.0 b y 2006**

Sources: Broward County, City of Cooper City, Coral Springs Improvement District, Town of Davie, Ferncrest Utilities, City of Fort Lauderdale, City of Hollywood, City of Margate, City of Pembroke Pines, City of Plantation, City of Sunrise.

3. Miami-Dade County

The four facilities located in Miami-Dade County are the City of Homestead Wastewater Treatment Facility, the Miami-Dade North District Wastewater Treatment Plant, the Miami-Dade Central Wastewater Treatment Plant and the South District Wastewater Treatment Plant. The locations of these facilities are shown in the Miami-Dade County Wastewater Treatment Facilities Map (Map 1-17) as well as in Table 1-5.

The City of Homestead Wastewater Treatment Facility provides wastewater service to 10,100 residential and non-residential customers. The three Miami-Dade Water and Sewer Department (WASD) wastewater facilities provide sewer service to approximately 315,000 retail customers and thirteen wholesale customers.

The total wastewater permitted capacity in Miami-Dade County is 374.0 mgd. The average annual daily demand, 275.0 mgd, represents 73.5% of the permitted capacity in the county, while the peak demand, 364.52 mgd represents 97.5% of the capacity. Information for each facility is shown below in Table 5-7. Additional facility data is shown Appendix B.

Two of the four facilities report that additional capacity will be added. The City of Homestead Wastewater Treatment Facility is adding an additional 6.0 mgd by 2009. The Miami-Dade North District Wastewater Treatment Plant will be adding an additional 7.5 mgd of capacity to their facility by 2005. These additions will bring the total capacity in Miami-Dade County to 387.5 mgd by 2009.

Table 4-7: Miami-Dade County WWTP Capacities

PLANT NAME	DESIGN CAPACITY (MGD)	PERMITTED CAPACITY (MGD)	PEAK FLOW (MGD)	AVG. ANNUAL DAILY FLOW (MGD)	ADDITIONAL CAPACITY (MGD) & Year
Homestead	6.0	6.0	12.0	4.73	6.0 - 2009
M-D North District	112.5	112.5	98.94	84.99	7.5 - 2005
M-D Central District	143.0	143.0	138.2	101.01	0.0
M-D South District	112.5	112.5	115.38	84.27	0.0
County Total	**374.0**	**374.0**	**364.52**	**275.0**	**13.5 by 2009**

Sources: City of Homestead and Miami-Dade Water and Sewer Department

4. Monroe County

Information on the wastewater treatment plants located throughout Monroe County can be found on page 26, as well as in Appendix C.

C. STORMWATER MANAGEMENT SYSTEM

The surface water management basins of eastern Broward and Miami-Dade Counties were first delineated in the 1950's by the U.S. Army Corps of Engineers (COE) in their General Design Memorandum (GDM) for the Central and Southern Florida Flood Control Project (Project). Based on the hydrology of the basins, the COE designed and constructed a system of canals, levees, and control structures to provide flood protection for southern and central Florida.

The Project canals serve a variety of functions. The primary function of the canals is to provide flood protection for the basins in which they occur. Secondary uses of the canals include land drainage for agriculture and urban or residential development, and regulation of groundwater table elevations to prevent saltwater intrusion into local groundwater. Many of the canals are used to supply water for irrigation and to recharge the wellfields of local municipalities.

The Project control structures regulate the flow of water in the canals. In general they are used to discharge excess water from the basins during flooding and to maintain minimum water levels in the canal during drought periods. Some structures are usually closed to prevent water from passing from one basin to another, but can be opened to supply water from one basin or canal to another as necessary. The coastal structures have the additional function of preventing saltwater from a tidal or storm surge from entering those canals discharging to tidewater.

1. Broward County

The information on the primary canals and basins in Broward County is from the South Florida Water Management District's *An Atlas of Eastern Broward County Surface Water Management Basins* (November 1987).

There are nine basins in eastern Broward County. They are: the Hillsboro Canal, C-14, Pompano, C-13, C-12, North New River Canal, C-11, C-10, and C-9. A map depicting the boundaries of each basin in Broward County is shown on Map 1-21.

Hillsboro Canal Basin

There are two Project canals in the Hillsboro Canal basin: the Hillsboro Canal and the section of the L-36 borrow canal between the Hillsboro Canal and S-38B. There are four Project structures regulating flow in the Hillsboro Canal Basin: S-38B, S-39, S-39A, and Deerfield Lock (G-56). Design criteria for these structures are given in Table 4-8.

The Project canals and control structure in the Hillsboro Canal basin have five functions: 1) to provide flood protection and drainage for the basin; 2) to supply water to the basin during periods of low natural flow; 3) to convey excess water from Water Conservation Area (WCA) 1 to tidewater; 4) to intercept and control seepage from WCA 2A; and 5) to maintain a groundwater surface elevation west of Deerfield Lock adequate to prevent saltwater intrusion into local groundwater.

There is no design storm for the Hillsboro Canal. It was built prior to the Project.

The Canal above Deerfield Lock will pass approximately 1600 cubic feet per second (cfs) without any flooding occurring in the basin. This provides flood protection of around three-quarters of an inch of runoff per day; however, allowable runoff into the canal above Deerfield Lock is 1.3 inches of runoff per day (35 cfs per square mile). The total allowable inflow to the canal upstream of the Deerfield Lock varies from 2500 to 2700 cfs depending on the drainage area assumed. A hydraulic analysis made in 1974 indicated that if all culverts and pumps discharging

into the canal were operated at the allowable runoff discharge, the tailwater state at S-39 would be approximately 11ft NGVD. Stages above 9ft NGVD cause flooding in pasturelands in the southwestern portion of the basin. To pass the allowable discharge at a stage no higher than 9ft NGVD, the Hillsboro Canal would have to be enlarged from Powerline Road to the west end at S-39. It would also require a new structure (to replace the spillway at Deerfield Lock) capable of passing approximately 3000 cfs at a difference between headwater and tailwater stages of 0.5ft.

Table 4-8: Hillsboro Canal Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
Deerfield Lock (G-56) Stage Divide	Weir with flashboards 5-bays, 12ft each Crest lgth = 60ft Crest elev = 1.0ft NGVD Gated spillway Crest lgth = 25ft Crest elev = -4.5ft NGVD	4.0	3.5	HW = 7.7	1600	HW = 10.86 TW = 9.2 Q = 3700
S-39 Water supply, regulatory releases to Hillsboro Canal from WCA-1	Spillway Taintor Gate 16ft x 9.2ft Weir lgth = 15ft Crest elev = 2.5ft NGVD	11.0	9	TW = 9.0 max HW = WCA 1 regulation schedule	800	TW = 12.39
S-39A Stage divide	Culvert with riser and stop logs 3.72in x 54ft CMP			HW = 7.0 - 7.5		
S-38B Divide C-14 and Hillsboro basins	Gated Culvert 1.66in x 72ft CMP Invert elev = 0ft NGVD	9.0	7.65			

Source: *An Atlas of Eastern Broward County Surface Water Management Basins,* November 1987. Pg. 10

C-14 (Cypress Creek Canal) Basin

There are seven project structures regulating flow in the C-14 basin: S-37A, S-37B, S-38, S-38A, S-38B, S-38C, and G-65. Design criteria for these structures are given in Table 4-9. The Project canals and control structures in the C-14 basin have five functions: 1) to provide flood protection and drainage for the basin; 2) to supply water to the C-14, Pompano Canal, and the C-13 basins during periods of low natural flow; 3) to convey excess water in Water Conservation Area (WCA) 2A to tidewater; 4) to intercept and control seepage from WCA 2A; and 5) to maintain a groundwater surface elevation west of S-37A adequate to prevent saltwater intrusion into local groundwater.

The C-14 basin is divided into two regions with regard to design flood protection: an eastern basin and a western basin. The eastern basin was designed for a 1 – 30 year flood protection and the western basin was designed for a 1 – 10 year flood protection.

Table 4-9: C-14 (Cypress Creek Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-37A Stage Divide	Spillway, 2 gates 25ft x 12.8ft Crest lgth = 50ft Crest elev = -7.7ft NGVD	3.0	2	HW = 3.5	3890	HW = 5.19 TW = 4.28 Q = 3800 Q = 3060 (measured)
S-37b Stage Divide	Spillway, 2 gates 25ft x 6.6ft Crest lgth = 50ft Crest elev = 0ft NGVD	7.2	4.7	HW = 7.5	3390	HW = 8.99 TW = 6.14 Q = 3108 (measured)
G-65 Divide C-14 and Pompano Canal	Gated Culvert 1.54in x 1500ft RCP Invert elev = 0ft NGVD			TW = 4.5 (at G-57)	50-55 (water supply)	
S-38C Stage Divide, C-13 and C-14; water supply C-13	Culvert with riser and stop logs 2.72in x 35ft CMP Invert elev = 1.55ft NGVD					
S-38A Stage Divide, L-36 stage and C-14 stage	Culvert with riser and stop logs 2.60in x 70ft CMP Invert elev = 2.0ft NGVD	9.0	8.0	HW = 7.65	190	
S-38 Water supply, C-13 and C-14	Gated Culvert 2.72in x 52ft CMP Invert elev = 2.0 to 3.0ft NGVD	9.8	7.0	TW = 8.2 max (not to exceed 8.2)	500	HW = 15.47 TW = 10.47 Q = 586
S-38B Divide C-14 and Hillsboro basins	Gated Culvert 1.65in x 72ft CMP Invert elev = 0ft NGVD	9.0	7.7			

Source: *An Atlas of Eastern Broward County Surface Water Management Basins,* November 1987. Pg. 18

Pompano Canal Basin

There are two Project structures regulating flow in the Pompano Canal basin: G-57 and G-65. Design criteria for the structures are given in Table 4-10. The Project canal and control structures in the Pompano Canal basin have three functions: 1) to provide flood protection and drainage for the Pompano Canal Basin; 2) to supply water to the basin during periods of low natural flow; and 3) to maintain a groundwater table elevation west of G-57 adequate to prevent intrusion of saltwater into local groundwater.

The present Pompano Canal is the remnant of the longer, original Pompano Canal. It has a 1 – 25 year flood protection.

Table 4-10: Pompano Canal Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
G-57 Stage Divide	Steel sheet-pile dam with 6-bay, flashboard controlled weir Net lgth = 31.5ft Crest elev = -2.5ft NGVD			HW = 4.5 (dry season) HW = 2.5 (flood conditions)	375	HW = ~5.5
G-65 Divide C-14 and Pompano Canal	Gated Culvert 1.54in x 1500ft RCP Invert elev = 0.0ft NGVD			TW = 4.5 (at G-57)	50-55 (water supply)	

Source: *An Atlas of Eastern Broward County Surface Water Management Basins,* November 1987. Pg. 23

C-13 (Middle River Canal) Basin

There are three Project canals in the C-13 basin: C-13, the section of the L-36 borrow canal between C-14 and L-35A, and the section of C-42 between S-125 and L-35A. There are four Project structures regulating flow in the C-13 basin: S-36, S-38C, S-125, and S-124. Design criteria for these structures are given in Table 4-11.

The Project canals and control structures in the C-13 basin have five functions: 1) to provide flood protection and drainage for the basin; 2) to supply water to the C-13 basin during periods of low natural flow; 3) to intercept and control seepage from Water Conservation Area (WCA) 2B; 4) to supply water to the City of Plantation in the North New River Canal (NNRC) basin; and 5) to maintain a groundwater table elevation west of S-36 adequate to prevent intrusion of saltwater into local groundwater.

C-13 was design to provide 1 – 25 year flood protection. The original Army Corps of Engineers design called for a discharge of 1090 cfs at S-36; however, by 1972, the basin had been enlarged by some 43 percent. In a study conducted by the District in 1972, it was reported that the discharge at S-36 for a 1 – 25 year storm for the enlarged basin would be 1560 cfs. The new canal sections are large enough to pass 100 percent of the Standard Project Flood (SPF) in most cases, and 200 percent of the SPF for the reach of C-13 just west of the Florida Turnpike.

Table 4-11: C-13 (Middle River Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-36 C-13	Spillway, 1 gate 25ft x 14ft Crest lgth = 25ft Crest elev = -7.0ft NGVD	5.6	5.0	HW = 4.5	1560	HW = 7.38 TW = 5.71 Q = 2390
S-125 Divide C-13 & N. New River Canal (Water supply to Plantation)	Gated Culvert 1.48in x 40ft CMP Invert elev = 2.0ft NGVD	6.5	6.0	HW = 6.0 TW = 3.5 - 4.5 (at Sewell Lock)	40 (Regulatory releases)	HW = 8+
S-38C Stage divide, C-13 and C-14; water supply C-13	Culvert with risers and stop logs 2.72in x 35ft CMP Invert elev = 1.55ft NGVD					
S-38 Water supply C-13 and C-14	Gated Culvert 2.72in x 52ft CMP Invert elev = 2ft to 3ft NGVD	9.8	7.0	TW = 8.2 Maximum	500	HW = 15.47 TW = 10.47 Q = 586
S-124 Normal flow-closed Flood conditions-open	Gated Culvert 5.72in x 48ft CMP Invert elev = -1.0ft NGVD	7.0	6.6	HW = 5.0 - 5.5	490	*HW = 7.8+ TW = 6.86 (*HW may have been above 8.0)

Source: *An Atlas of Eastern Broward County Surface Water Management Basins,* November 1987. Pg. 33

C-12 (Plantation Canal) Basin

C-12 is the only Project canal in the C-12 basin. S-33 is the only Project control structure regulating flow in the C-12 basin. Design criteria for S-33 are given in Table 4-12.

The Project canal and control structure in the C-12 basin have two functions: 1) to provide flood protection and drainage for the basin; and 2) to maintain a groundwater table elevation west of S-33 adequate to prevent intrusion of saltwater into local groundwater.

C-12 was designed to provide 1 – 25 year flood protection. The design call for S-33 to pass 620 cfs with a headwater stage of 5.11ft NGVD and a tailwater stage 4.61ft NGVD.

Table 4-12: C-12 (Plantation Canal) Basin Structure Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-33 Stage divide	Spillway, 1 gate 20ft x 9ft Crest lgth = 20ft Crest elev = -2.0ft NGVD	5.9	4.9	HW = 3.5	920	HW = 6.13 TW = 5.89 Q = 614

Source: *An Atlas of Eastern Broward County Surface Water Management Basins,* November 1987. Pg. 38

North New River Canal (NNRC)Basin

There are three Project canals in the NNRC basin: the NNRC, the L-35A borrow canal, and the C-42. There are eight Project control structures regulating flow in the NNRC basin: S-34, S-124, S-125, S-141, S142, S-143, Sewell Lock (G-54), and G-123. Design Criteria for the Project Structures are given in Table 4-13.

The Project canals and canal structures have four functions: 1) to provide flood protection and drainage for the NNRC basin; 2) to supply water to the basin during periods of low natural flow; 3) to convey excess water from Water Conservation Areas (WCAs) 2A, 2B, and 3A to tidewater; and 4) to intercept and control seepage from WCA 2B.

The North New River Canal was excavated and extended to drain the Everglades, and to serve as a transportation route between Lake Okeechobee and the east coast. After the District tookl over management of the canal from the Everglades Drainage District, a study was performed to determine the flood protection provided by the canal. The results of the study indicated that the existing hydraulic cross-section of the NNRC and the capacity of Sewell Lock were adequate for 1 – 25 year protection, and that a 1 – 50 year storm would cause some flooding in the western reaches. This was deemed to be adequate protection and the canal has not been enlarged under District management.

Table 4-13: North New River Canal Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD	Optimum Stage (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
Sewell Lock (G-54) Stage Divide	Flash board spillway 8-bays Net length ~ 45ft Weir elev = -3.6ft NGVD	3.5	3.0	HW = 3.5-4.5	1300	HW = 5.97 TW = 4.66 Q = 2040
S-124 Normal Flow – closed Flood conditions - open	Gated Culvert 2.72in x 48ft CMP Invert elev = -3.0 - -4.0 ft NGVD	7.0	6.6	HW = 5.0 – 5.5	490	*HW = 7.8+ TW = 6.89 *HW may have been above 8.0
S-34 Water supply to NNR Canal	Gated Culvert 2.72in x 133ft CMP Invert elev = -3.0 - -4.0ft NGVD	16.9	6.0	HW = ~ 11 – 11.5 TW = 3.5 – 4.5 TW = 6.0 max	350	HW = 13.08 TW = 7.05 Q = 728
S-125 Divide C-13 & NNR Canal (regulatory release to NNRC from C-13)	Gated Culvert 1.48in x 40ft CMP Invert elev = 2.0ft NGVD	6.5	6.0	HW = 6.0 TW = 3.5 – 4.5 (at Sewell Lock)	40 (Regulatory Release)	HW = 8.0+
G-123 Pumps from NNRC to WCA-3A	Pumping Station 4 units: 100 cfs each	2.0	12.0	HW = 3.5 HW = 11.0	400	
S-141 Stage Divide	Sheet-pile overflow weir in L-38E Flashboard control Crest lgth = 30.0 ft Crest elev = 2.0 ft NGVD	10.0	8.0	Regulation schedule in WCA 2B	435	
S-142 Stage Divide Water Supply	Gated Culvert 2.72in x 42ft CMP Invert elev = 2.0ft NGVD	11.0	9.0	Regulation schedule in WCA 3A	500	
S-143 Stage Divide Water Supply	Gated Culvert 2.72in x 70ft CMP Invert elev = 2.0ft NGVD	13.0	10.0	Regulation schedule in WCA 2A	500	

Source: *An Atlas of Eastern Broward County Surface Water Management Basins,* November 1987. Pg. 47

C-11 (South New River Canal) Basin

There are four Project canals in the C-11 basin: C-11, C-11S, the section of the L-33 borrow canal between C-11 and Hollywood Boulevard, and the L-37 borrow canal. There are eight Project control structures regulating flow in the C-11 basin: S-9, S-9XN, S-9XS, S-13, S-13A, G-86N, G-86N, and G-87. Design Criteria for the Project Structures are given in Table 4-14.

The Project canals and control structures in the C-11 basin have four functions: 1) to provide flood protection and drainage for the basin; 2) to supply water to the basin during periods of low natural flow; 3) to intercept and control seepage from Water Conservation Area (WCA) 3A; and 4) to maintain a groundwater table elevation west of S-13 adequate to prevent saltwater intrusion onto local groundwater.

The C-11 system was designed to provide flood protection of up to three-quarters of an inch of runoff per day from the western basin. The S-9 pump station was designed with a capacity of 2870 cfs. 1650 cfs was for flood protection (adequate to handle the design runoff) and 1220 cfs was for seepage removal (seepage to the borrow canals of L-33 and L-37 from Water Conservation Area 3A).

The pumping station at S-13 was designed to provide the eastern basin with flood protection of up to three-quarters of an inch of runoff per day. Depending on the headwater and tailwater stages at the S-13 spillway, gravity flow from the eastern C-11 basin to the east may provide additional flood protection of up to three-quarters of an inch of runoff per day.

Table 4-14: C-11 (South New River Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD	Optimum Stage (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-13 Stage Divide	Pump and Spillway 3 units – 180 cfs each 1.16in x 11.3 ft gate Weir lgth = 16.0 ft Weir crest lgth = 8.0ft NGVD	1.2 (gravity) 2.2 – 2.5 (pump)	1.0 (gravity) 6.2 – 6.5 (pump)	HW = 1.6 (gravity) HW = 2.2 (gravity)	540 (gravity) 540 (pumped)	HW = 4.02 TW = 4.85 Q = 1050
S-13A Divide Structure during flooding	Gated Culvert 2.72in x 66ft CMP 2.54in x 60ft CMP	2.5	2.0	3.0 to west	120	HW (west) = 6.27 TW (east) = 4.79
S-9	Pump, 3 units 960 cfs each	4.0	14.4	HW = 3.0 – 3.5	2880	Intake = 6.1 Q = 2060
S-9XS Stage Divide	Culverts with risers and stop logs 2.72in x 42ft CMP Invert elev = -1.0ft NGVD			HW = 6.8		
S-9XN Stage Divide	Culvert with risers and stop logs 2.72in x 84ft CMP Invert elev = -4.8ft NGVD			HW = 6.0		
G-86S Stage Divide	Culvert with risers and stop logs 1.60in x 135ft CMP Invert elev = -1.14ft NGVD			HW = 5.5		
G-86N Stage Divide	Culvert with risers and stop logs 1.60in x 135ft CMP Invert elev = -1.0ft NGVD			HW = 5.5		
G-87 (presently used as a drainage divide between C-11 and C-9 basins)	Gated Culvert 1.84in x 75ft CMP Invert elev = -5.0ft NGVD				Divide Structure	

Source: *An Atlas of Eastern Broward County Surface Water Management Basins,* November 1987. Pg. 55

C-10 (Hollywood Canal) Basin
There are two Project canals in the C-10 basin, the C-10 and the C-10 Spur Canal. There are no Project control structures in the C-10 basin.

The Project canals in the C-10 basin provide flood protection and drainage for the C-10 basin. There is no regulation of water surface elevations and discharge from the basin is not controlled. Water supply to the basin is from local rainfall.

C-10 was designed to pass the Standard Project Flood (SPF). The SPF design stage at the confluence of C-10 with the Dania Cut-off Canal is 4.7ft NGVD. The maximum SPF design stage in C-10 is 5.6ft NGVD near the Johnson Street Bridge.

C-10 was constructed without a control structure to maintain the water surface elevation in the canal high enough to prevent saltwater intrusion into local groundwater. Since there is no water supply to C-10 from outside the basin, it would be impossible to maintain the required water surface elevation in the canal during periods of low flow even if the structure was in place.

C-9 (Snake Creek Canal) Basin
There are two Project canals in the C-9 basin, the C-9 and the L-33 borrow canal. There are also three Project control structures in the basin, the S-29, S-30, and S-32. Design Criteria for the Project Structures are given in Table 4-15.

The Project canals and control structures in the C-9 basin have four functions: 1) to provide flood protection and drainage for the basin; 2) to supply water to the C-9 basin for irrigation and municipal water supply during periods of low natural flow; 3) to intercept and control seepage from Water Conservation Area (WCA) 3B; and 4) to maintain a groundwater table elevation west of S-29 adequate to prevent saltwater intrusion into local groundwater.

C-9 in the eastern sub-basin was design to pass 100 percent of the Standard Project Flood. This provides for essentially unlimited inflows to C-9 from the eastern sub-basin. The western sub-basin is very prone to flooding because of low ground surface elevations relative to the eastern sub-basin. Major storms can reverse flow in C-9 from east to west because of rapid runoff into the eastern reaches of C-9. Allowable pumped inflow to C-9 in the western sub-basin is limited to 0.75 inches of runoff per day. Unlimited gravity inflow to C-9 is allowed in the western basin if development limitations are met.

Table 4-15: C-9 (Snake Creek Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-29 Stage divide	Spillway, 4 gates 22ft x 15ft Crest lgth = 88ft Crest elev = -11.0ft NGVD	3.0	2.5	HW = ~2.0	4780	HW = 3.88 Q = 4100
S-30 Controls water stored between L-30 and SR-27	Gated Culvert 3.84in x 172ft CMP Invert elev = -3.0ft NGVD			HW = 6.0	560	
S-32 Water supply to C-9	Gated Culvert 2.72in x 40ft CMP Invert elev = -2.0ft NGVD	2.0	~1.60	TW = 2.0 HW = 6.0	2	HW = 6.59

Source: *An Atlas of Eastern Broward County Surface Water Management Basins,* November 1987. Pg. 65

2. Miami-Dade County

The information on the primary canals and basins in Broward County is from the South Florida Water Management District's *An Atlas of Eastern Dade County Surface Water Management Basins* (October 1987).

There are seventeen basins in Miami-Dade County. They are: the C-1, C-2, C-3, C-4, C-5, C-6, C-7, C-8, C-9, C-100, C-102, C-103, C-111, North Canal, Florida City Canal, Model Land, and Homestead Air Force Base basins. A county map showing the boundaries of each basin in on Map 1-24.

Area A and Area B

Area A is an area of relatively good drainage. It includes all land areas excluding Area B, Everglades National Park, and the Water Conservation Areas. Restrictions on land use and development are less severe in Area A. Area B is bounded on the north by the Miami-Dade-Broward County Line, on the south by Kendall Drive, on the west by L-31N and L-30, and on the east by the Palmetto Expressway. Land elevations in this area are low relative to the coastal ridge in eastern Miami-Dade County. Consequently, drainage from this area is poor and the area is prone to flooding. Severe limitations are placed on land use and development in Area B. Several of the basins in Miami-Dade County include portions of Area B.

C-9 (Snake Creek Canal) Basin

There are two Project canals in the C-9 basin: C-9 and the L-33 borrow canal. These canals have three functions: 1) to provide flood protection and drainage for the C-9 basin; 2) to supply water to the basin for irrigation and municipal water supply; and 3) to maintain a groundwater table elevation near the lower reach of C-9 adequate to prevent saltwater intrusion into local groundwater.

There are also three Project structures in the C-9 basin. They are: S-29, S-30, and S-32. The design criterion for the structures is given in Table 4-16.

When drainage to C-9 is more than adequate to maintain the optimum stage in the canal, excess water from rainfall and seepage can be stored in the area between L-33 and U.S Highway 27. This water can be released to C-9 through S-30 as needed for water supply.

C-9 in the eastern sub-basin was designed to pass 100 percent of the Standard Project Flood. The western sub-basin, however, is very prone to flooding because of low ground surface elevations relative to the eastern sub-basin. Major storms can reverse flow in C-9 from east to west because of rapid runoff into the eastern reaches of C-9. Allowable pumped inflow in C-9 in the western sub-basin is limited to three-quarters of an inch of runoff per day. Unlimited gravity inflow to C-9 is allowable in the western basin if development limitations are met.

The C-9 West sub-basin is in Area B. As stated above, Area B is poorly drained, and is subject to severe limitations on development.

Table 4-16: C-9 (Snake Creek Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-29 Stage divide	Spillway, 4 gates 22ft x 15 ft; Crest length = 88ft; Crest Elev. = 11ft MGVD	3	2.5	~2.0	4780	HW = 3.88 Q = 4100
S-31 Controls outflow from CA-3B to C-6	Gated Culvert 3.84in x 172ft CMP Invert Elev = -3.0ft NGVD	6.0 (not fixed; used for regulatory or water supply discharges from CA-3B to C-6)	4.0 (not fixed; used for regulatory or water supply discharges from CA-3B to C-6)		700	TW = 6.59 Q = 1090
S-30 Controls Water stored between L-30 and US Hwy 27	Gated Culvert 3.84in x 288ft CMP Invert Elev = -5.0ft NGVD			6.8 (L-30 borrow canal)	560	
S-32 Water supply to C-9	Culvert 1.72" x 40ft CMP Invert Elev = -2.0ft NGVD			6.8 (L-30 borrow canal)		HW = 6.59

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 11

C-8 (Biscayne Canal) Basin

C-8 is the only Project canal in the C-8 basin. The canal has two functions: 1) to provide flood protection and drainage for the C-8 basin, and 2) to maintain a groundwater table elevation adequate to prevent saltwater intrusion into local groundwater. There is also one Project structure, the S-28, located in the C-8 basin. Design criteria for this structure is located in Table 4-17.

C-8 begins in the east borrow of the Palmetto Expressway at the northwest corner of the Miami Lakes subdivision. Flow in the canal is to the east with discharge via S-28 to Biscayne Bay just south of the municipal boundary between Miami Shores and Biscayne Park.

The portion of the C-8 basin west of the Palmetto Expressway (4.3 square miles) is in Area B and is therefore subject to severe limitations on development.

C-8 (in Area A) was designed to pass 100 percent of the Standard Project Flood. The design flow is 3220 cfs. Only 200 cfs of this design flow is for runoff from the portion of the basin located in Area B.

Table 4-17: C-8 (Biscayne Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-28 Stage divide	Spillway, 2 gates 27ft x 17.5ft; Crest length = 54ft; Crest Elev. = 13.5ft MGVD	2.3	1.8	1.8	3220	HW = 4.24 Q = 1640 downstream Q = 835 upstream

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 15

C-7 (Little River Canal) Basin

C-7 is the only project canal in the C-7 basin. The canal has two functions: 1) to provide flood protection and drainage for the C-7 basin and 2) to maintain a groundwater table elevation adequate to prevent saltwater intrusion into local groundwater. During periods of low natural flow, water is supplied in the basin from C-6. There are also two Project structures in the C-7 basin, S-27 and G-72. Design criteria for these structures are given in Table 4-18.

If the stage in C-6 is high enough, up to 50 cfs will flow from C-6 to C-7 by way of the borrow canal along the Palmetto Expressway. The portion of the basin west of the Palmetto is in Area B, and is subject to severe limitations on development.

C-7 was designed to pass the runoff from a 1 – 100 year storm. However, much of this basin (west of Red Road) was in agricultural production at the time the canal was designed and constructed. Subsequent development of the area to residential and commercial properties may have significantly increased the runoff and decreased the flood protection provided by the canal.

Table 4-18: C-7 (Little River Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-27 Stage divide	Spillway, 2 gates 27ft x 15ft; Crest length = 54ft; Crest Elev. = 11.0ft MGVD	3.2	2.7	~1.7	2800	HW = 4.49 Q = 1100 HW = 3.81 Q = 892
G-72 Divide C-7 and C-6 basins	Culvert 4.72in x 75ft CMP Flashboards Variable Invert elevs = -2.44 to -1.97ft NGVD				(Divide structure - water supply)	

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 20

C-6 (Miami Canal) Basin

The C-6 is the only project canal in the C-6 basin. The canal has four functions: 1) to provide flood protection and drainage for the C-6 basin; 2) to supply water to the C-6, C-7, and C-9 basins for irrigation and municipal water supply; 3) to maintain a groundwater table elevation near the lower reach of the C-6 adequate to prevent intrusion of saltwater into local groundwater and 4) to accept flows from the C-5 and C-4 canals and to convey these discharges to Biscayne Bay. There are five structures controlling flow in the C-6 basin: S-26, S-31, G-72, S-32, and S-32A. The design criteria for these structures are given in Table 4-19.

The C-6 begins at S-31 at the intersection of L-30 and L-33 just west of State Road 27. Flow in the canal is to the southeast with discharge via S-26 to Biscayne Bay just north of U.U. Highway 41.

If the stage in C-6 is high enough, up to 50 cfs of water flows from C-6 to C-7 by way of the borrow canal along the Palmetto Expressway.

C-6 was designed to pass 100 percent of the Standard Project Flood from Area A (downstream of the Florida East Coast Railroad). The design flow for the canal is 3470 cfs. Of this flow, 1240 cfs if for runoff from the 11.6 square miles of Area A and 2230 cfs is for runoff from the 40 square miles of Area B.

Table 4-19: C6 (Miami Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-26 Stage divide	Spillway, 2 gates 26ft x 14ft; Crest length = 52ft; Crest Elev. = -11.1ft NGVD	4.4	3.9	~2.5	3470	HW = 5.14 Qds = 1900 Qups = 515
S-25B Stage divide	Spillway, 2 gates 22ft x 11.9ft; Crest length = 44ft; Crest Elev. = -7.9ft NGVD	4.4	4.1	2.8	2000	HW = 3.19 ft Q = 1668
G-72 Divide C-7 and C-6 basins	Culvert 4.72in x 75ft CMP Flashboards Variable Invert elevs = -2.44 to -1.97ft NGVD				(Divide structure - water supply)	
S-31 Controls outflows from CA-3B to C-6	Gated Culvert 3.84in x 75ft CMP Invert elev = 3.0ft NGVD	6.0 (not fixed. Used for regulatory of water supply discharges from CA-3B to C-6.)	4.0 (not fixed. Used for regulatory of water supply discharges from CA-3B to C-6.)		700	TW = 6.59 Q = 1090
S-32 Water supply to C-9	Culvert 2.72in x 40ft CMP Invert elev = -2.0ft NGVD					HW = 6.59
S-337 Water supply, South Dade Conveyance System	Culvert 6.84in x 164ft CMP Invert elev = -3.0 to -4.0ft NGVD	5.5	5.2		605	

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 25

C-4 (Tamiami Canal) Basin

There are two project canals in the C-4 basin: the C-4 and the L-30 borrow canal. The canals have three functions: 1) to provide flood protection and drainage for the C-4 basin; 2) to supply water to the C-2, C-3, C-4, and C-5 basins; and 3) to maintain a groundwater table elevation near the lower reach of C-4 adequate to prevent intrusion of saltwater into local groundwater. There are also four Project structures controlling flow in the C-4 basin: S-25B, S-25A, S-336, and G-199. The design criteria for these structures are given in Table 4-20.

C-4 was designed to pass 100 percent of the Standard Project Flood from the area east of S.W. 87th Ave. (Area A). That portion of the C-4 basin in Area B (west of S.W. 87th Ave.) is poorly drained. A stage of 5.5ft NGVD will cause flooding in Sweetwater east of S.W. 117th Avenue.

Several changes have been made in the basin (to C-4 and to its control structures) that have probably changed the hydraulic profiles in C-4 from that reported in the Army Corps of Engineers General Design Memorandum. The channel between Flagler Street and Blue Lagoon has been excavated. The sheet pile weir at the Florida East Coast Railway crossing has been removed, and a control structure (S-25B) has been built at LeJeune Road. The hydraulic profiles for C-4 need to be restructured.

Table 4-20: C-4 (Tamiami Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD	Optimum Stage (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-25 Stage Divide	Culvert 1.96in x 60ft CMP Invert elev = -4.0ft NGVD with automated slide gate	2.5	1.60	2.0	260	HW = 3.60 Q = 258
S-25B Stage Divide	Spillway, 2 gates 22ft x 11.9ft Crest lgth = 44ft Crest elev = -7.9ft NGVD	4.4	4.1	2.8	2000	HW = 3.19 ft Q = 1668
S-25A Divide structure between C-4 and C-5	Gated Culvert 1.60in x 73ft CMP (Upstream 13ft is 54in) Invert elev = -1.7ft NGVD					
S-32 Water supply to C-9	Culvert 2.72in x 40ft CMP Invert elev = -2.0ft NGVD					HW = 6.59
S-336 Water supply, South Dade Conveyance System	Gated Culvert 3.54in x 85ft CMP Invert elev = -1.8ft NGVD	4.7	4.2	(TW stage rise to –6.5ft during wet season)	145	
G-119 Water Supply to C-4	Gated Culvert 2.72in x 64ft CMP Invert elev = -3.5ft NGVD					
S-334 Water Supply, South Dade Conveyance System	Spillway, 1 gate 29ft x 14.6ft Crest lgth = 29ft Crest elev = -6.9ft NGVD	5.0	4.7		1230	
S-335 Water Supply, South Dade Conveyance System	Spillway, 1 gate 20ft x 11.2ft Crest lgth = 20ft Crest elev = -4.2ft NGVD	5.0	4.8		525	

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 31

C-5 (Comfort Canal) Basin

C-5 is the only Project canal in the C-5 basin. It provides drainage and flood protection for the basin. C-5 begins as a bifurcation of C-4 at Blue Lagoon northwest of Coral Gables. Flow in the canal is to the east to the canal's confluence with C-6, three-quarters of a mile downstream of S-26. There are two Project control structures in the C-5 basin: S-25A and S-25. The design criteria for these structures are given in Table 4-21.

Design flow for C-5 is 260 cfs with a design stage of 2.5 ft NGVD. This basin is very small with a high percentage of impervious surface, the result of urban development. As a consequence, flood stages peak rapidly. Telemetry control of the gate at S-25 makes it easier to control the height of flood stages.

C-5 drains an old section of Miami with natural ground surface elevation as low as 2.5ft NGVD. Some homes in the area are subject to flooding during severe storms.

Table 4-21: C-5 (Comfort Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-25 Stage divide	Culvert 1.96in x 60ft CMP Invert elev = -4.0ft NGVD with automated slide gate	2.5	~1.60	2.0	260	HW = 3.60 Q = 258
S-25A Divide structure between C-4 and C-5	Culvert 1.60in x 73ft CMP (Upstream 13ft is 54in) Invert elev = -1.7ft NGVD					

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 35

C-3 (Coral Gables Canal) Basin

C-3 is the only Project canal in the C-3 basin. It provides drainage and flood protection to the basin, and it maintains a groundwater table elevation adequate to prevent intrusion of saltwater into local groundwater. There is one Project Structure located in the C-3 basin, G-97. The design criterion for this structure is given in Table 4-22.

C-3 is designed to provide 1 - 25 year flood protection. Design discharge at G-97 is 640cfs, which consists of 540 cfs from the Coral Gables Canal basin and 100 cfs from C-4. Urban development of the area has probably increased runoff to C-3 and decreased the flood protection although this has not yet been documented. There are some older urban areas with low-lying streets and low floor elevations, which flood during heavy rainfalls.

Table 4-22: C-3 (Coral Gables Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
G-97 Coral Gables Canal	Sheet Pile Weir 8 Removable piles Crest lgth = 47ft Crest elev = 3.0ft NGVD	4.5	3.0	2.5 to 3.0 (Controlled by S-25B in C-4)	640 (540 from C.G. Basin, 100 from C-4 Basin)	HW = 6.58 Qus = 613 HW = 5.73 Qds = 933

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 39

C-2 (Snapper Creek Canal) Basin

The western portion of the C-2 basin is in Area B, which has limited drainage capabilities. C-2 is the only Project canal in the C-2 basin. It has three functions: 1) to provide drainage and flood protection for the basin; 2) to supply water to the C-2 and C-100 basins for irrigation; and 3) to maintain a groundwater table elevation near the lower reach of C-2 that is adequate to prevent saltwater intrusion into local groundwater. There are also two Project structures in the C-2 basin: S-22 and S-121. The design criteria for these structures are given in Table 4-23.

C-2 was an existing Miami-Dade Canal as the time of the Project. It was enlarged by the Project to pass 100 percent of the Standard Project Flood for the Area A portion of the C-2 basin.

A new hydrologic analysis of the C-2 basin is needed. There are three reasons for this: 1) at the time of its construction, C-2 upstream of S-22 to Sunset Drive was over-excavated 150 to 300 percent; 2) the canal has been enlarged from Sunset Drive to U.S. Highway 41 in order to provide fill for the Homestead Extension of the Florida Turnpike; and 3) the basin has experienced considerable urban development with an increase in the impervious surface in the basin. The enlargement of the canal has reduced the stage that will occur in the canal for a given discharge.

Table 4-23: C-2 (Snapper Creek Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-22 Stage divide	Spillway, 2 gates 17ft x 15ft Crest lgth = 34ft Crest elev = 11.0ft NGVD	3.5	2.7	2.9	1915	HW = 3.60 Q = 2110 ds Q = 1220 ups HW = 6.02
S-121 Divide structure C-2 and C-100C. Water supply C-2 to C-100C	Culvert 8ft x 8ft box x 128ft 8ft x 8ft gate Invert elev = -4.5ft NGVD	2.9 (water supply)	2.8 (water supply)		100 (water supply)	

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 44

C-100 Basin

There are four Project canals in the C-100 basin: the C-100, C-100A, C-100B, and C-100C. These canals have three functions: 1) to provide drainage and flood protection for the C-100 basin; 2) to supply water to the basin for irrigation; and 3) to maintain a groundwater table elevation near the lower reach of C-100 adequate to prevent saltwater intrusion to local groundwater. There are also six Project structures in the C-100 Basin: S-118, S-119, S-120, S-121, S-122, and S-123. The design criteria for these structures are given in Table 4-24.

C-100 was designed for 1 – 10 year flood protection. The design discharge is 2300 cfs.

Table 4-24: C-100 Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-123 Stage divide	Spillway, 2 gates 25ft x 12.7ft Crest lgth = 50ft Crest elev = -7.3ft NGVD	2.0	1.5	2.0 Wet season 3.5 dry season	2300	HW = 3.87 TW = 2.90 Q = 3000
S-118 Stage divide	Spillway, 1 gate 20ft x 10ft Crest lgth = 20ft Crest elev = -5.0ft NGVD	3.6	3.1	3.7	860	HW = 4.94
S-119 Stage divide	Spillway, 1 gate 12ft x 7.3ft Crest lgth = 12ft Crest elev = -2.4ft NGVD	4.4	3.9	4.7	400	
S-120 Stage divide	Culvert 9ft x 9ft box x 104ft 6ft x 6ft gate Invert elev = -3.0ft NGVD	4.8	4.3	5.0	150	
S-121 Water supply, C-2 to C-100C	Culvert 8ft x 8ft box x 128ft 8ft x 8ft gate Invert elev = -4.5ft NGVD	2.9 (water supply)	2.8 (water supply)		100 (water supply)	
S-122 Water supply, C-1 to C-100B	Gated Culvert 3.72in x 60ft RCP Invert elev = -4.0ft NGVD	2.5 (water supply)	2.0 (water supply)		200 (water supply)	

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 49

C-1 (Black Creek Canal) Basin

There are four Project canals in the C-1 basin: C-1, C-1W, C-1N, and the L-31N. The canals have three functions: 1) to provide drainage and flood protection for the C-1 basin; 2) to supply water to the C-1 and C-100 basins for irrigation; and 3) to maintain a groundwater table elevation near the lower reach of C-1 adequate to prevent saltwater intrusion to local groundwater. A portion of the C-1 basin is located in Area B.

There are also ten Project structures in the C-1 basin. Five of these (S-21, S-148, S-338, S-149, and S-122) are directly related to the operation of C-1/C-1W and C-1N. The other five structures (S-173, S-331, S-334, S-335, and S-336) along with the L-31N borrow canal are part of the South Dade Conveyance System (SDCS) which supplies water to basins in south Miami-Dade County. The design criteria for the structures are given in Table 4-25.

C-1 (in Area A) was designed to pass 40 percent of the Standard Project Flood (SPF), however, right-of-way was purchased for a canal large enough to pass 60 percent of the SPF. Actual stages in the canal are probably lower than the design stages tabulated in the Army Corps of Engineer's General Design Memorandum due to over-excavation and free digging in the lower reaches of the canal. Downstream of the West Dade Expressway, the channel has been excavated from a 60 percent to a 100 percent SPF hydraulic section. The western reaches have been enlarged to handle over design flows when the South Dade Conveyance System is supplying water to downstream reaches during drought conditions.

The optimum stage upstream of S-148 and S-149 is 5.5ft NGVD; however, this is rarely achieved due to large amounts of seepage past the structures. Flows of 40 – 50 cfs have been measured with the structures closed.

Table 4-25: C-1 (Black Creek Canal) Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD	Optimum Stage (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-21 Stage Divide	Spillway, 3 gates 27ft x 10.7ft Crest lgth = 81ft Crest elev = -6.5ft NGVD	1.9	1.4	1.2 Wet Season 2.0 dry season	2560	HW = 3.87 TW = 2.90 Q = 3000
S-148 Stage Divide	Spillway, 2 gates 20ft x 12ft Crest lgth = 40ft Crest elev = -7.0ft NGVD	3.9	3.7	4.5	1500	HW = 4.94
S-149 Stage divide	Gated Culvert 2.84 x 63ft CMP Invert elev = -4.5ft NGVD	5.0	3.8	5.5	400	
S-122 Divide structure C-1 and C-100B Water supply C-1 to C-100B	Gated Culvert 3.72in x 60ft CMP Invert elev = -4.0ft NGVD	2.5 (water supply)	2.0 (water supply)		200 (water supply)	
S-338 Water supply, C-1	Gated Culvert 2.84in x 85ft CMP Invert elev = -4.5ft NGVD	6.5	6.0		305	
S-334 Water Supply to S. Dade Conveyance System	Spillway, 1 gate 29ft x 14.6ft Crest lgth = 29ft Crest elev = -6.9ft NGVD	5.0	4.7		1230	
S-335 Water Supply, South Dade Conveyance System	Spillway, 1 gate 20ft x 11.2ft Crest lgth = 20ft Crest elev = -4.2ft NGVD	5.0	4.8		525	

Table 4-25: C-1 (Black Creek Canal) Basin Structures Design Criteria (Cont.)

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD	Optimum Stage (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-336 Water Supply, South Dade Conveyance System	Gated Culvert 3.54in x 85ft CMP Invert elev = -1.8ft NGVD	4.7	4.2	(TW stage rise to – 6.5ft during wet season)	145	
S-331 Water Supply to C-111	Pump 3 units	3.0 (water supply)	6.0 (water supply)	4.5 to 5.0 HW (depending on stage at groundwater well Angel)	1160	
S-173 Divide Structure	Culvert 1.72in x 70ft RC Invert elev = -2.5ft NGVD	5.0 (divide structure when pumps operate)	4.5 (divide structure when pumps operate)	4.5 to 5.5 (depending on conditions in E. Everglades)	150	

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 55

C-102 Basin

There are two Project canals in the C-102 basin, C-102 and C-102N. The canals have three functions: 1) to provide drainage and flood protection for the C-102 basin; 2) to supply water to the basin for irrigation; and 3) to maintain a groundwater table adequate to prevent saltwater intrusion into local groundwater. Water is supplied to the C-102 basin from the South Dade Conveyance System (SDCS) during periods of low natural flow. There are also four Project structures located in the C-102 basin: S-21A, S-165, S-195, and S-194. The design criteria for these structures are given in Table 4-26.

During normal operating, the 9.4 square mile area adjacent to C-102 west of Krome Avenue drains to the east via C-102 to Biscayne Bay. During flood conditions S-194 is closed and this area drains to the west to the L-31N borrow canal and the C-111 basin.

C-102 was designed for a 1 – 10 year flood protection (40 percent SPF), but there is sufficient right-of-way for a canal that provides 1 – 30 year flood protection (60 percent SPF).

Table 4-26: C-102 Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-21A Stage divide	Spillway, 2 gates 20ft x 11.8ft Crest lgth = 40ft Crest elev = -7.8ft NGVD	1.9	1.4	1.2 Wet season 2.0 dry season	1330	HW = 2.87 TW = 2.37 Q = 2454 cfs
S-195 Divide Structure	Gated culvert 2.84in x 152in x 90ft CMP Arch Invert elev = -1.8ft NGVD	5.6	4.8	5.5	180	HW = 7.1 TW = 6.4 Q = 400
S-194 Divide structure	Culvert 2.84in x 90ft RCP, gated Invert elev = -2.5 to -3.5ft NGVD	3.9 (water supply)	3.7 (water supply)	5.5 (to west)	~ 190	HW = 9.23 TW = 9.15 (storm Dennis)
S-165 Stage divide	Spillway, 1 gate 12ft x 7ft Crest lgth = 12ft Crest elev = -0.5ft NGVD	5.6	4.6	5.5	450	HW = 7.55 TW = 6.28 Q = 666

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 60

C-103 Basin

There are three Project canals in the C-103 basin: C-103, C-103S, and C-103N. These canals have three primary functions: 1) to provide drainage and flood protection for the C-103 basin; 2) to supply water to the basin for irrigation; and 3) to maintain a groundwater table elevation adequate to prevent saltwater intrusion to local groundwater. Water is supplied to the C-102 basin from the South Dade Conveyance System (SDCS) during periods of low natural flow. There are also five Project structures in the C-103 basin: S-20F, S-179, S-167, S-166, and S-194. The design criteria for these structures are given in Table 4-27.

5.2 square miles of the C-103 basin the Homestead and Florida City area, are not drained. At the time C-103S was constructed, the city commissioners of Homestead and Florida City declined to have the canal constructed within their respective city limits.

Table 4-27: C-103 Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-20F Stage divide	Spillway, 3 gates 25ft x 13ft Crest lgth = 75ft Crest elev = -9.0ft NGVD	1.9	1.4	1.4 Wet season 2.2 dry season	2900	HW = 3.05 TW = -0.5 Q = 5780 (storm Dennis)
S-179 Stage Divide	Spillway, 2 gates 25ft x 12ft Crest lgth = 50ft Crest elev = -7.5ft NGVD	3.8	3.2	2.5 to 3.5 (Dry season depending on rainfall) 3.5 (Wet season)	1920	HW = 4.94 TW = 3.82 Q = 2680 (storm Dennis)
S-167 Stage Divide	Spillway, 1 gate 12ft x 7ft Crest lgth = 12ft Crest elev = -0.5ft NGVD	5.6	4.8	5.5	330	HW = 7.68 TW = 5.5 Q = 410
S-196 Divide Structure	Culvert 1.84in x 58ft RCP gated Invert elev = -2.5 to -3.5ft NGVD	6.5	5.5	5.5 (to west)	200 at 1ft (divide structure closed during storms)	HW = 8.75 TW = (under water) (storm Dennis)

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 65

North Canal, Florida City Canal, Model Land, and Homestead Air Force Base Basin
The area occupied by the Homestead Air Force Base, and the area south of the C-103 basin, east of Old Dixie Highway and Card Sound Road, and west and north of L-31E is drained by five existing Miami-Dade County canals: The five canals are:

- The Military Canal which drains the 4.7 square miles of the Homestead Air Force Base
- The North Canal which drains 7.8 square miles
- The Florida City Canal which drains 12.5 square miles
- The North Model Land Canal and
- The South Model Land Canal, which together drain 28.1 square miles.

All of the operational Project control structures (S-20G, S-20F, and S-20) in these basins provide water surface elevation control upstream of their locations in the canals in which they occur. Design criteria for S-20G is given in Table 4-30. Design criteria for S-20 and S-20A are given in Table 4-29, and design criteria for S-20F is given in Table 4-28.

Table 4-28: North Canal and Florida City Basin Structure Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-20F Stage Divide	Spillway, 3 gates 25ft x 13ft Crest lgth = 75ft Crest elev = -9.0ft NGVD	1.9	1.4	1.4 (Dry season) 2.2 (Wet season)	2900	HW = 3.05 TW = -0.5 Q = 5780 (storm Dennis)

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 76

Table 4-29: Model Land Canal Basin Structures Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-20 Stage Divide	Spillway, 1 gate 16ft x 11.4ft Crest lgth = 16ft Crest elev = -7.4ft NGVD	1.5	1.0	1.2 (Dry season) 1.5 (Wet season)	450	HW = 2.78 TW = 2.31 Q = 740
S-20A Stage Divide	Spillway, 1 gate 16ft x 13.3ft Crest lgth = 16ft Crest elev = -9.3ft NGVD	**---NEVER OPENED---**				

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 76

Table 4-30: Homestead Basin Structure Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-20G Stage Divide	Spillway, 1 gate 25ft x 12.3ft Crest lgth = 25ft Crest elev = -8.3ft NGVD	2.0	1.5	1.0 (Dry season) 2.0 (Wet season)	900	HW = 3.89 TW = 2.47 Q = 1030

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 69

C-111 Basin

There are five operational canals in the C-111 basin: C-111, C-111E, C-113, the L-31N borrow canal, and the L-31W borrow canal. These canals have three functions: 1) to provide drainage and flood protection for the C-111 basin; 2) to supply water to the C-111, C-102, and C-103 basins, and to Everglades National Park (i.e., to Taylor Slough and the Panhandle Park); and 3) to maintain a groundwater table elevation near the lower reach of C-111 adequate to prevent saltwater intrusion to local groundwater. Water is supplied to the C-111 basin from the South Dade Conveyance System (SDCS) by way of the L-31N borrow canal.

There are twelve Project control structures in the C-111 basin. They are: S-331, S-173, S-194, S-196, S-176, S-174, S-332, S-175, S-177, S-178, S-18C, and S-197. The design criteria for these structures are given in Table 4-31.

C-111 is designed to give flood protection from a 1 – 10 year storm. The system handled the April 25, 1979 storm, a 1 – 15 year event, with 11 to 12 inches of rain. However, Tropical Storm Dennis, a 1 – 100 year event with up to 25 inches of rain, caused extensive flooding in the basin.

Table 4-31: C-111 Basin Structure Design Criteria

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-177 Stage divide	Spillway, 1 gate 22ft x 12ft Crest lgth = 22ft Crest elev = -7.1ft NGVD	4.7	4.2	2.8 - 3.3 (October) 3.0 - 3.7 (after planning to harvest) 3.6 - 4.2 (rest of yr)	1400	HW = 4.94 TW = 4.30 Q = 1695 (storm Dennis)
S-176 Stage divide	Spillway, 1 gate 20ft x 8ft Crest lgth = 16ft Crest elev = -1.0ft NGVD	6.3	5.9	5.5	630	HW = 7.53 TW = 7.15 Q = 888 (storm Dennis)
S-174 Stage divide	Spillway, 1 gate 16ft x 8ft Crest lgth = 16ft Crest elev = -1.5ft NGVD	6.0	5.5	TW = 3.5 (Oct to Feb or Mar) HW = 4.5	500	HW = 7.56 TW = 7.18 Q = 550
S-175 Stage divide	Culvert 3.84in x 56ft RCP gate Invert elev = -5.0ft NGVD	5.0	4.5	HW = 3.5 (Oct to end of harvest) HW = 4.5 (rest of yr)	500	HW = 5.85 TW = 5.16 Q = 534 (storm Dennis)
S-332 Water supply to Taylor Slough for ENP	Pump 6 units	2.0	<5.8		165	
S-196 Divide Structure	Culvert 1.84in x 58ft RCP gated Invert elev = -2.5 to -3.5ft NGVD	6.5	5.5	5.5 (to west)	200 cfs at 1 ft (divide structure closed during storms)	HW = 8.75 TW = (under water storm Dennis)

Table 4-31: C-111 Basin Structure Design Criteria (Cont.)

Structure	Type	Design HW (ft NGVD)	Design TW (ft NGVD)	Optimum State (ft NGVD)	Design Q (cfs)	Peak Stage (ft NGVD) and Q (cfs)
S-194 Divide Structure	Culvert 2.84in x 90ft RCP gated Invert elev = -2.5 to -3.5ft NGVD	3.9 (water supply)	3.7 (water supply)	5.5 (to west)	~190 (water supply divides structure during storm)	HW = 9.23 TW = 9.15 (storm Dennis)
S-173 Divide Structure	Culvert 1.72in x 70ft RCP gated Invert elev = -2.5ft NGVD	5.0 (Divides structure when pumps operate)	4.5 (Divides structure when pumps operate)	4.5 to 5.5 (depending on conditions in E Everglades)	150	HW = 8.02 TW = 8.25 (storm Dennis)
S- 178 Stage Divide	Box Culvert 12ft x 10ft controlled 2.8ft x 8ft gates, top gate closed at 5.0ft	4.6	3.9	4.5	300	
S-197 Flood Discharges	Gated Culvert 3.84in x 66ft CMP Invert elev = -8.0ft NGVD	1.4	0.6	Nomally Closed (open when S-180 TW = 1.9, closed when HW = 1.6)	550	
S-18C Stage divide	Spillway, 2 gates 22ft x 11ft Crest lgth = 44ft Crest elev = -7.0ft NGVD	3.3	2.8	HW = 2.3ft NGVD	2100	HW =2.74 Q = 3430
S-331 Water supply to C-111	Pump 3 units	3.0 (water supply)	6.0 (water supply)	HW = 4.5 - 5.0 (depending on Stage at groundwater well Angel)	1160	

Source: *An Atlas of Eastern Dade County Surface Water Management Basins,* November 1987. Pg. 82

V. TASK 5 - ANALYSIS OF EXISTING BACKLOG AND SERVICE DEFICIENCIES

A. POTABLE WATER

Data collected on potable water in previous tasks was used to determine the existing backlog and service deficiencies in the Region. For the purpose of this study there are two levels of backlog: 1) any facility whose maximum-day demand is currently operating at over 100% of its permitted capacity; and 2) any facility whose maximum-day demand is 75% or more of the facility's permitted capacity. Pursuant to the Florida Department of Environmental Protection Administrative Code 62-555.348, suppliers of water shall routinely compare the total net quantity of finished drinking water produced each day by their treatment plants(s) with the total permitted maximum-day operating capacity of their plant(s). When the total maximum-day quantity of finished water produced exceeds 75% of the total permitted maximum-day operating capacity of the plant, the supplier of water shall submit source/treatment/storage capacity analysis reports to the Department. Each initial or updated report shall evaluate the capacity of all source, treatment, or storage facilities connected to a water system and shall contain the following information:

a) The capacity of each water treatment plant's source water facilities and treatment facilities; the permitted maximum-day operating capacity and, if applicable, permitted peak operating capacity of each plant; and the useful capacity of each finished-water storage facility;
b) The maximum-day and average annual daily quantities of finished water produced by each plant during each of the past ten years or during each of the years the plant has been in operation, whichever is less;
c) Projected total water demands – total annual average annual daily demand and total maximum-day demand (including fire-flow demand if fire protection is being provided) – for at least the next ten years and projected total finished-water storage need (including fire storage if fire protection is being provided) for at least the next ten years;
d) An estimate of the time required for maximum-day water demand (including fire-flow demand if fire protection if being provided) to exceed the total permitted maximum-day operating capacity of the plant(s) and an estimate of the time required for finished-water storage need (including fire storage if fire protection is provided) to exceed the existing total useful finished-water storage capacity;
e) Recommendations for new or expanded source, treatment, or storage facilities; and
f) A recommendation schedule showing dates for design, permitting, and construction of recommended new or expanded source, treatment, or storage facilities.

Further analysis was done to determine at what level the Region is operating using average annual daily demand[12].

[12] For the purpose of this study the average annual daily flow is taken to mean the total volume of water received in a year divided by 365 days.

1. Remaining and Additional Capacity

Each water plant has two different capacities, design capacity and permitted capacity. The design capacity of a plant, sometimes called the "physical" capacity, is the production capacity of the plant. This is the amount per day that a plant can physically treat or hold, irrespective of regulatory constraints. The permitted capacity is the capacity that is established by a regulating or permitting agency. In almost all cases the permitted capacity of a plant will be the most constraining, which is why it is used to determine the operating rate of the plants.

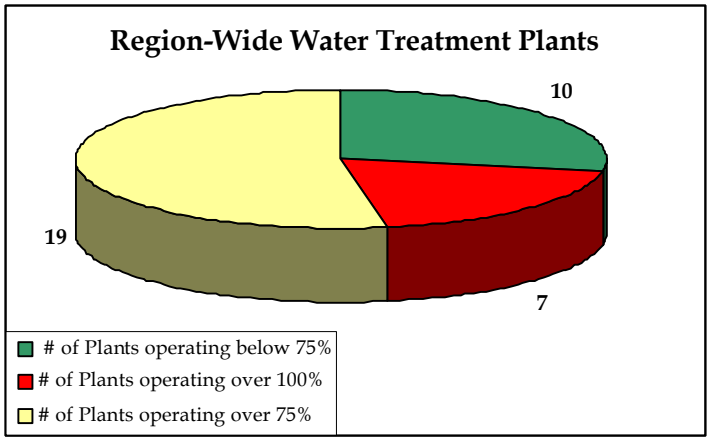
In certain cases, the permitted capacity of a plant is less than the design capacity. There are many reasons for this, most of which are unique to a particular plant. When the permitted capacity is less than the design capacity, there is "surplus" capacity in the plant. In certain cases when there is surplus capacity, plant operators may have the ability to re-rate their facility to get an increase in permitted capacity. The constraints under which a facility may re-rate are those that were applied to the plant when it was first permitted.

A re-rate to increase the permitted capacity so it equals the design capacity of the plant would involve only a new permit; there would be no capital costs associated with a change of this nature. Conversely, those plants that do not have the ability to re-rate would have to increase the design capacity of the facility, which would require additional capital costs. Several plants within the Region currently have expansion plans in place.

2. The Region

As a whole, the Region (Broward, Miami-Dade, and Monroe Counties) has a total of thirty-six water treatment plants with a combined permitted capacity of 889.634 mgd. Of the thirty-six plants, ten are currently operating at below 75% of the permitted capacity during maximum-day demand, nineteen are operating at between 75% and 100%, and 7 plants have operating rates above 100%. Figure 5-1 illustrates this.

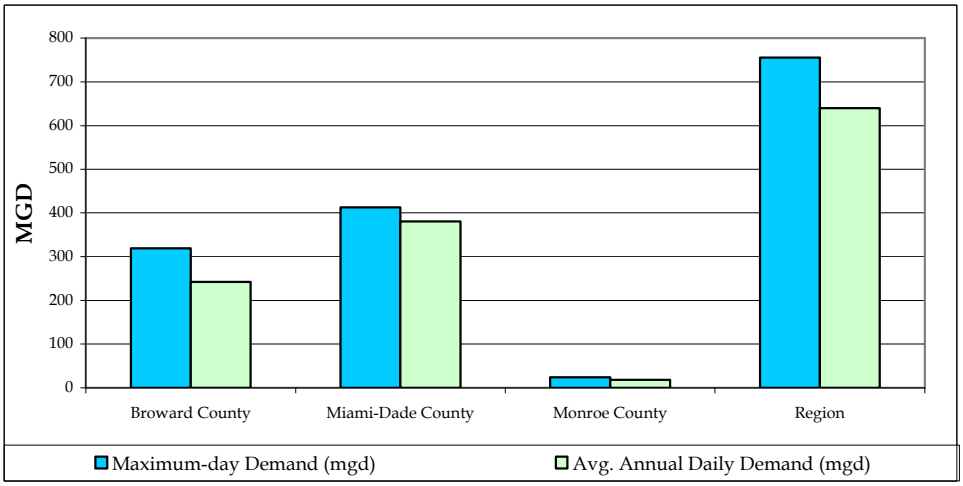
Figure 5-1: Regional Operating Rates



Source: SFRPC

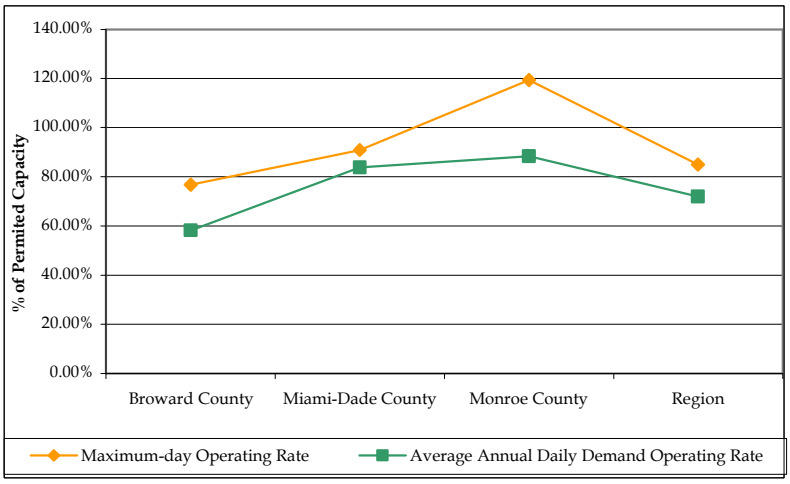
When using peak demand or maximum day demand to determine the operating rate in the Region, it was found that the Region is operating at 84.9% of the permitted capacity. When average annual daily demand is used, the Region is operating at 71.9% of the total permitted capacity. This means that during the maximum day demand, the Region as a whole is operating above the 75% threshold we have set for determining backlog. Overall, there is a backlog of 117.31 mgd of capacity during maximum day demand. The Region is also approaching the 75% point during average annual daily demand. Figure 5-2 illustrates each County's demands, while Figure 5-3 shows the operating rates of each County during times of both demands.

Figure 5-2: Water Demand in the Region



Source: SFRPC

Figure 5-3: WTP Operating Rates in the Region



Source: SFRPC

There are a total of seventeen plants in the Region that have the possibility to re-rate and gain additional "surplus" capacity. This could result in an additional 123.512 mgd of capacity to the Region with no capital costs. Currently each county is operating over the 75% threshold during maximum day demand. With the additional capacity that re-rating would bring, the Region as whole would drop just below the 75% mark. Of the three counties, Broward County would be the only one whose operating rate during maximum day demand would drop below 75%. Please see Table 5-1 below.

Table 5-1: Regional Operating Rates

	Design Capacity	Permitted Capacity	Available Capacity	Current Operating Rate	Operating Rate after Re-rating of Plants
Broward County	490.646	415.944	74.7	76.7%	65.0%
Miami-Dade County	500.50	453.76	46.74	90.9%	82.4%
Monroe County	22.0	19.93	2.07	119.4%	108.2%
Region	**1013.146**	**889.634**	**123.512**	**84.9%**	**74.5%**

Source: SFRPC, Broward County, Miami-Dade County, FKAA

As a whole, the expansion plans that are in place around the Region would provide for an additional 158.26 mgd of design capacity. This would bring the total design capacity in the Region to 1171.406 mgd. Each county is summarized in Table 5-2 below along with the totals for the Region.

Table 5-2: Planned Capacity Increases

	Capacity Increase (mgd)	Current Design Capacity	Future Design Capacity
Broward County	37.0	490.646	527.646
Miami-Dade County	111.26	500.50	611.76
Monroe County	10.0	22.0	32.0
Region	**158.26**	**1013.146**	**1171.406**

Source: SFRPC, Broward County, Miami-Dade County, FKAA

3. Broward County

Within Broward County there are twenty-eight water treatment plants. Based on the data gathered in the survey (Task 4) it was determined that the total permitted capacity within the County is 415.944 million gallons per day (mgd), with a peak flow of 319.005 mgd and an average annual daily demand of 241.984 mgd. During times of peak demand, the County as a whole could be operating at as much as 76.7% of the permitted capacity. At average annual daily demand, the county is operating at 58.2% of its permitted capacity. During maximum-day demand there is a current backlog of 9.4 mgd of capacity. Given the criteria we have established for defining backlog, Broward County is currently operating above the points at which concern is raised.

When each individual plant is examined, a wide range of operating rates is found. Of the 28 plants in Broward County, eighteen are currently operating at over 75% of their permitted capacity during maximum-day demand. Of these eighteen plants, three are currently operating over their permitted capacity during maximum-day demand, and ten are operating below 75%. Table 5-3 lists all plants in Broward County with their operating rates. Figure 5-4 shows the breakdown of plants within the County. Map 5-1 shows the service areas of the facilities and the operating rate of each.

Table 5-3: WTP's in Broward County Operating at over 75% during Average Annual Daily Demand

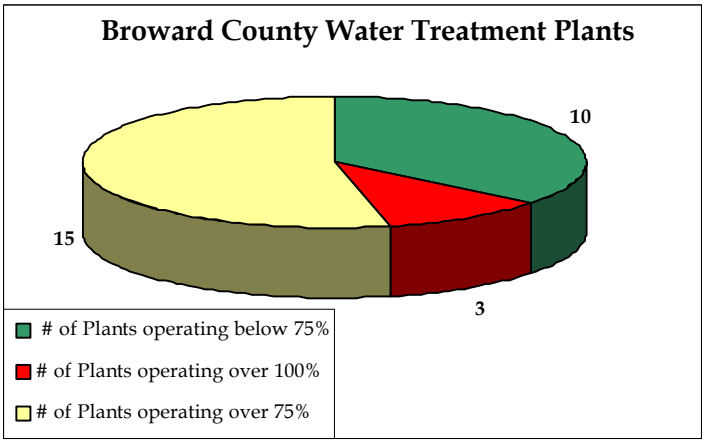
Plant permit #	Plant Name	Permitted Capacity	Peak Demand	Operating Rate
4060167	Broward County 1A WTP	16.0	9.0	56.3%
4060163	Broward County 2A WTP	30.0	17.4	58.0%
4060209	City of Coral Springs	16.0	10.0	64.4%
4060253	City of Dania Beach WTP	4.0	3.394	84.9%
FL4060573	City of Hallandale Beach	10.0	7.0	70.0%
FL4060787	City of Lauderhill	8.137	8.581	105.5%
06-58-00059	City of Margate WTP	13.51	9.077	67.2%
4061429	City of Tamarac Utilities West	8.3	13.07	157.5%
4060282	Cooper City Utilities	7.0	5.7	81.4%
4060291	Coral Springs Improvement District	5.75	5.45	94.8%
06-58-00027	Davie WTP System I	3.4	1.193	35.1%
06-58-00028	Davie WTP System III	4.0	3.57	89.3%
4060254	Deerfield Beach East Water Plant	16.8	14.9	47.0%
4060254	Deerfield Beach West Water Plant	18.0	14.9	82.8%
4060419	Ferncrest Utilities	1.0	0.874	87.4%
40604864	Fiveash Water Plant (Ft. Lauderdale)	67.3	57.1	84.8%
4060614	Hillsboro Beach Water Plant	1.0	1.3	130.0%
4060642	Hollywood Water Treatment Plant	57.5	32.8	57.0%
W11035	Miramar West Water Plant	7.5	6.5	86.7%
4064390	N. Springs Improvement District	6.547	5.41	82.6%
4061407	Park City WTP (Sunrise # 2)	6.0	5.53	92.2%
4061083	Pembroke Pines WTP #2	16.2	15.5	95.7%
4061121-01	Plantation Central WTP	12.0	10.564	88.0%
4061121-02	Plantation East WTP	12.0	8.212	68.4%
06-58-00079	Pompano Beach WTP	24.0	21.9	91.3%
4061408	Sawgrass WTP (Sunrise #3)	18.0	12.2	67.8%

Table 5-3: WTP's in Broward County Operating at over 75% during Average Annual Daily Demand (Cont.)

Plant permit #	Plant Name	Permitted Capacity	Peak Demand	Operating Rate
4034326	Southwest (S. Broward) WTP	2.0	1.88	94.0%
4061410	Springtree WTP (Sunrise #1)	24.0	22.7	94.6%
	Broward County	**415.944**	**319.005**	**76.7%**

Sources: Broward County, city of Coral Springs, Dania Beach WTP, City of Hallandale Beach, Cooper City Utilities, Hollywood WTP, City of Sunrise, City of Fort Lauderdale, Hillsboro Beach Water Plant, City of Margate, Ferncrest Utilities, Pompano Beach WTP, City of Tamarac Utilities, Deerfield Beach, Miramar, Coral Springs Improvement District, North Springs Improvement District, Town of Davie, City of Lauderhill, Pembroke Pines, and City of Plantation

Figure 5-4: Operating Rates of Broward County Water Treatment Plants



Source: SFRPC

Hold for map 5-1: Broward County Water Service Area Operating Rates

The picture changes slightly when analysis is done using average annual daily demand to determine operating rates instead of maximum day demand. Using the same criteria it was found that seven plants are operating at over 75% of their permitted capacities during average annual daily demand, with one plant, the Hillsboro Beach Water Plant, operating at more than 100% of its permitted capacity. Table 5-4 lists these plants.

Table 5-4: WTP's in Broward County Operating at over 75% During Average Annual Daily Demand

Plant permit #	Plant Name	Permitted Capacity	Avg. Annual Daily Demand	Operating Rate
FL4060787	City of Lauderhill	8.137	6.859	84.3%
4061429	City of Tamarac Utilities West	8.3	6.441	77.6%
06-58-00028	Davie WTP System III	4.0	3.41	85.3%
4060419	Ferncrest Utilities	1.0	0.768	76.8%
4060614	Hillsboro Beach Water Plant	1.0	1.09	109.0%
W11035	Miramar West Water Plant	7.5	5.8	77.3%
4061083	Pembroke Pines WTP #2	16.2	13.5	83.3%

Source: SFRPC, City of Lauderhill, City of Tamarac, Town of Davie, Ferncrest Utilities, Hillsboro Beach, City of Miramar, City of Pembroke Pines

Currently, eleven facilities in Broward County may have the ability to re-rate in order for the permitted capacity to equal the design capacity of the plant. This could result in an additional 74.7 mgd of capacity in Broward County. Of those eleven plants, eight are currently operating at more than 75% of their permitted capacity during maximum day demand. These eight plants are: Fiveash Water Plant, Hillsboro Beach Water Plant, Pompano Beach WTP, City of Tamarac Utilities West, Coral Springs Improvement District, North Springs Improvement District, City of Lauderhill, and Pembroke Pines WTP #2. Table 5-5 lists all eleven plants.

Table 5-5: WTP's in Broward County Whose Permitted Capacities Are Less Than Their Designed Capacities

Plant Name	Design Capacity	Permitted Capacity	Available Capacity	Current Operating Rate
Broward County 2A WTP	40.0	30.0	10.0	58.0%
City of Lauderhill	16.0	8.137	7.863	105.5%
City of Margate WTP	18.0	13.51	4.49	67.2%
City of Tamarac Utilities West	20.0	8.3	11.7	157.5%
Coral Springs Improvement District	7.12	5.75	1.37	94.8%
Fiveash Water Plant (Ft. Lauderdale)	75.0	67.3	7.7	84.8%
Hillsboro Beach Water Plant	2.016	1.0	1.016	130.0%
Hollywood WTP	61.0	57.5	3.5	57.0%
North Springs Improvement District	6.81	6.5474	.2626	82.6%
Pembroke Pines WTP #2	18.0	16.2	1.8	95.7%
Pompano Beach WTP	50.0	24.0	26.0	91.3%

Source: SFRPC, Broward County, City of Lauderhill, City of Margate, City of Tamarac, Coral Springs Improvement District, City of Fort Lauderdale, Hillsboro Beach, City of Hollywood, North Springs Improvement District, City of Pembroke Pines, City of Pompano Beach

The operating rate of four of the eleven plants listed above would drop below the 75% level with the additional permitted capacity. Table 5-6 lists these four plants.

Table 5-6: WTP's in Broward County Whose Operating Rates Would Drop Below 75% If Permitted Capacity Equaled Designed Capacity

Plant Name	Available Capacity	Current Operating Rate	Operating Rate (with additional "surplus" capacity)
City of Lauderhill	7.863	105.5%	53.6%
City of Tamarac Utilities West	11.7	157.5%	65.4%
Hillsboro Beach Water Plant	1.016	130.0%	64.5%
Pompano Beach WTP	26.0	91.3%	43.8%

Source: SFRPC, City of Lauderhill, City of Tamarac, Hillsboro Beach, City of Pompano Beach

In addition to the capacity that could be gained through a re-rating, several plants in Broward County have expansion plans in place. According to data collected in the survey (Task 4), eight plants have plans to increase their capacity. Table 5-7 lists those plants.

Table 5-7: WTP's in Broward County With Planned Capacity Increases

Plant Name	Capacity Increase (mgd)	Expansion Completion Yr.	Current Design Capacity	Future Design Capacity
City of Dania Beach WTP	4.5	2007	3.0	7.5
City of Hallandale Beach	6.0	2006	10.0	16.0
Davie WTP System III	4.0	2006	4.0	8.0
Deerfield Beach West Water Plant	3.5	2008	18.0	21.5
Miramar West Water Plant	3.0	2007	7.5	10.5
Pembroke Pines WTP #2	6.0	2005-2007	18.0	24.0
Sawgrass WTP (Sunrise #3)	6.0	2006	18.0	24.0
Springtree WTP (Sunrise #1)	4.0	2006	24.0	28.0

Source: SFRPC, City of Dania Beach, City of Hallandale Beach, Town of Davie, City of Deerfield Beach, City of Miramar, City of Pembroke Pines, City of Sunrise

These additions would bring the total design capacity in Broward County to 527.646 mgd, up from the current capacity of 415.944 mgd.

4. Miami-Dade County

There are seven water treatment plants in Miami-Dade County. The combined permitted capacity of these plants is 453.76 mgd, with a maximum-day demand of 412.40 mgd and an average annual daily demand of 380.31 mgd. During times of maximum-day demand the County could be operating at as much as 90.9% of the total permitted capacity. This puts the County as a whole over the 75% threshold that has been established to determine backlog. The current backlog in the County, using maximum day demand, is 96.11 mgd. Using average annual daily demand, the County is operating at 83.8% of permitted capacity, also over the 75% threshold.

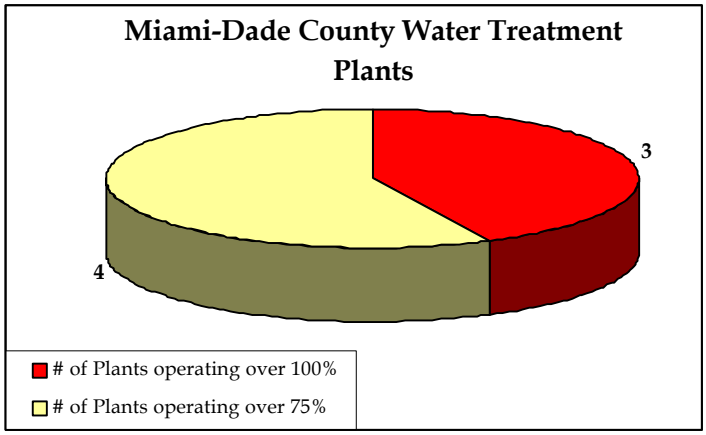
Analysis of each plant reveals that all seven plants are currently operating at over 75% of their permitted capacities during peak demand. Three of the plants are operating at more than 100% of their permitted capacity during peak demand, they are: Florida City, Winson Water Plant in North Miami, and the Norwood Water Plant in North Miami Beach. Table 5-8 lists the plants in Miami-Dade County and their operating rates. Figure 5-5 shows the breakdown of the plants in the County. Map 5-2, on the following page, shows the operating rates of each service area.

Table 5-8: Miami-Dade County WTP maximum-day Demand Operating Rates

Plant permit #	Plant Name	Permitted Capacity	Peak Demand	Current Operating Rate
13-00017-W	Alexander Orr	203.11	185.5	91.3%
4130645	City of Homestead	11.7	10.9	93.2%
PWO-000017	City of N. Miami Winson Water Plant	9.3	10.0	107.5%
4130255	Florida City	3.51	3.604	102.7%
13-00037-W	Hialeah-Preston	199.19	177.6	89.2%
4131618	Norwood Water Plant – N. Miami Beach	16.0	16.0	100.0%
13-00040-W	South Miami Dade	10.95	8.8	80.4%
	Miami-Dade County	**453.76**	**380.31**	**90.9%**

Source: SFRPC, Miami-Dade County, City of Homestead, City of North Miami, City of North Miami Beach, City of Florida City

Figure 5-5: Operating Rates of Miami-Dade County Water Treatment Plants



Source: SFRPC

Hold for map 5-2: Miami-Dade County Water Service Area Operating Rates

As with Broward County, the picture changes when average annual daily demand is used to determine operating rates rather than maximum-day demand. Five plants were found to be operating at more than 75% of their permitted capacity during average annual daily demand, with one additional plant, the City of Homestead plant, approaching the 75% threshold. The plants are listed in Table 5-9 along with their operating rates at average annual daily demand.

Table 5-9: Miami-Dade County WTP's Average Annual Daily Demand Operating Rates

Plant permit #	Plant Name	Permitted Capacity	Avg. Annual Daily Demand	Operating Rate
13-00017-W	Alexander Orr	203.11	171.93	84.6%
4130645	City of Homestead	11.7	8.499	72.6%
PWO-000017	City of N. Miami Winson Water Plant	9.3	8.5	91.4%
4130255	Florida City	3.51	2.983	85.0%
13-00037-W	Hialeah-Preston	199.19	166.1	83.4%
4131618	Norwood Water Plant – N. Miami Beach	16.0	15.5	96.9%
13-00040-W	South Miami Dade	10.95	6.8	62.1%

Source: SFRPC, Miami-Dade County, City of Homestead, City of North Miami, City of North Miami Beach, City of Florida City

Currently, five facilities in Miami-Dade County are eligible for re-rating to increase their permitted capacity. This could result in an additional 46.74 mgd of capacity to Miami-Dade County with no capital costs. Currently all five of these plants are operating at more than 75% of their permitted capacity during maximum day demand. Those plants that have "surplus" capacity and are currently operating at more than 75% of their permitted capacity during maximum day demand are highlighted in Table 5-10 below.

Table 5-10: WTP's in Miami-Dade County whose Permitted Capacities Are Less Than Their Design Capacities

Plant Name	Design Capacity	Permitted Capacity	Available Capacity	Current Operating Rate
Alexander Orr	217.74	203.11	14.63	91.3%
City of Homestead	16.7	11.7	5.0	93.2%
Florida City	4.03	3.51	0.52	102.7%
Hialeah Preston	225.0	199.19	25.81	89.2%
South Miami Dade	12.03	10.95	1.08	80.4%

Source: SFRPC, Miami-Dade County, Florida City, City of Homestead

Of the five plants that have the ability to re-rate and are currently operating at over 75% of the permitted capacity during maximum day demand, two would drop below the 75% point with the additional permitted capacity. See Table 5-11.

Table 5-11: WTP's in Miami-Dade County Whose Operating Rates Would Drop Below 75% If Permitted Capacity Equaled Design Capacity

Plant Name	Available Capacity	Operating Rate (at current Permitted Capacity)	Operating Rate (at current design Capacity)
City of Homestead	5.0	93.2%	65.3%
South Miami Dade	1.08	80.4%	73.2%

Source: SFRPC, City of Homestead, Miami-Dade County

Five plants in Miami-Dade County have expansion plans in place to add capacity. These additions would add 111.26 mgd of capacity to the County. These expansions would bring the total design capacity in Miami-Dade County to 611.76 mgd. See Table 5-12 below for information on each of the plants.

Table 5-12: WTP's in Miami-Dade County with Planned Capacity Increases

Plant Name	Capacity Increase (mgd)	Expansion Completion Yr.	Current Design Capacity	Future Design Capacity
Alexander Orr	60.26	2013	217.74	278.0
City of Homestead	5.0	2008	16.7	21.7
Hialeah-Preston	10.0	2005	225.0	235.0
Norwood Water Plant (N. Miami Beach)	16.0	2006	16.0	32.0
South Miami Dade	20.0	2006	12.03	32.03

Source: SFRPC, Miami-Dade County, City of Homestead, City of North Miami Beach

5. Monroe County

The J. Robert Dean Water Treatment Plant that is operated by the Florida Keys Aqueduct Authority serves Monroe County and the Florida Keys. This plant in located in Florida City. At times of peak demand, the plant is operating at 119.4% of its permitted capacity, and at 88.3% at its average annual daily demand. During Maximum day demand, there is a backlog of 11.8 mgd of capacity. The plant is operating over the threshold of 75% during times of both operating criteria.

Table 5-13: J. Robert Dean Water Treatment Plant Operating Rates

Plant Name	Permitted Capacity	Peak Demand	Operating Rate	Avg. Annual Daily Demand	Operating Rate
J. Robert Dean WTP	19.93	23.8	119.4%	17.6	88.3%

Source: SFRPC, FKAA

The J. Robert Dean Plant has the ability to re-rate to increase the permitted capacity. This would result in the possibility of an additional 2.07 mgd of capacity at the plant. Currently this plant is operating over the 75% threshold at the maximum day demand and the additional capacity gained through re-rating would not drop the plant below 75%. See Table 5-14 below.

Table 5-14: Operating Rates of J. Robert Dean Water Treatment Plant at Current Design Capacity

Design Capacity	Permitted Capacity	Available Capacity	Operating Rate (at current Permitted Capacity)	Operating Rate (at current design Capacity)
22.0	19.93	2.07	119.4%	108.2%

Source: SFRPC, FKAA

The J. Robert Dean WTP is currently planning an expansion that would increase its capacity by 10.0 mgd in 2025. This will bring the design capacity of the plant to 32.0 mgd.

B. WASTEWATER

Task 5 utilizes the data collected on wastewater in previous tasks to determine the existing backlog and service deficiencies in the Region. It has been determined that there are two levels of backlog: 1) any facility whose average annual daily demand is 75% or more of the facility's permitted capacity; and 2) any facility whose average annual daily demand is over 50% of the permitted capacity. Pursuant to the Florida Department of Environmental Protection Administrative Code 62-600.405, when the three-month average daily flow for the most recent three consecutive months exceeds 50% of the permitted capacity of the treatment plant or reuse and disposal systems, the permittee shall submit to the DEP a capacity analysis report.

The capacity analysis report or an update of the capacity analysis report shall evaluate the capacity of the plant and contain data showing the permitted capacity; monthly average daily flows; three-month average daily flows; and annual average daily flows for the past 10 years or for the length of time the facility has been in operation, whichever is less; seasonal variations in flow; flow projections based on local population growth rates and water usage rates for at least the next 10 years; an estimate of the time required for the three-month average daily flow to reach the permitted capacity; recommendations for expansions; and a detailed schedule showing dates for planning, design, permit application submittal, start of construction, and placing new or expanded facilities into operation.

While the data collected during the survey does not include the three-month average daily flow, average annual daily flows were collected. These are the flows that are used to determine the operating rates of the facilities, the counties, and the Region. While the DEP standards are strict, analysis of the Region is done at 50% operating rate level.

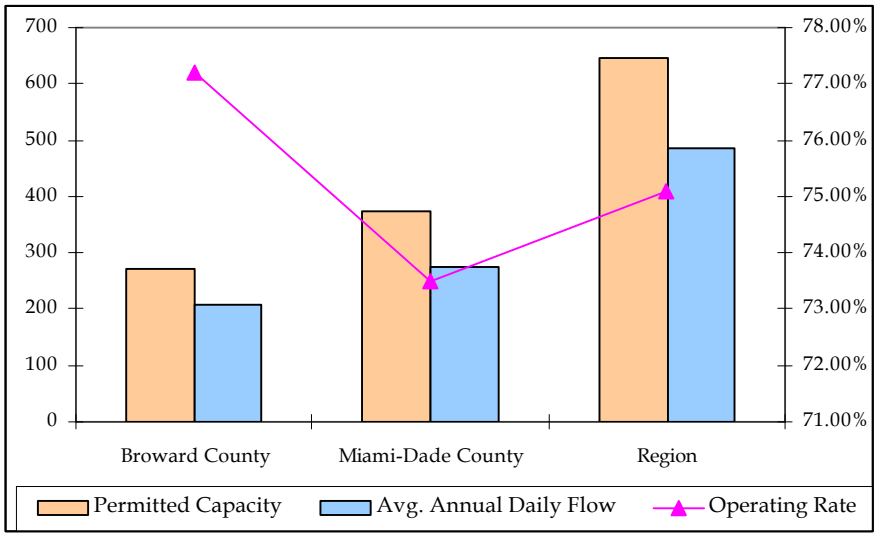
Unlike water treatment plants, wastewater plants generally have design and permitted capacities that are equal. There are three plants within Broward County that do have surplus capacity, and those three plants will be analyzed with the additional capacity. Plant expansion plans are also analyzed within each County and in the Region as a whole.

1. The Region

There are seventeen wastewater treatment facilities in the Region. This analysis does not include information on the small systems that provide treatment to residents of Monroe County, only those large systems in Broward and Miami-Dade Counties. Of the seventeen, eight have operating rate between 50% and 75% of the permitted capacity, while an additional eight plants are operating at over 75% of their permitted capacities. There is currently only one facility in the Region that operating below the 50% threshold.

The total permitted capacity in the Region is 645.16 mgd, with the annual average daily demand being 484.32 mgd. The Region as a whole is operating at 75.1%. This puts the Region past the 75% threshold by which backlog has been defined. When the region is analyzed using the 75% operating rate as the backlog point, there is a current backlog of 0.60 mgd of capacity in the Region's wastewater treatment plants. When 50% is used, there is a current backlog of 323.49 mgd of capacity in the Region. Figure 5-6 below provides information on each county and on the Region.

Figure 5-6: Comparison of Regional Wastewater Capacity, Demand, and Operating Rates



Source: SFRPC

The three plants in Broward County that have the ability to re-rate would bring an additional 4.46 mgd of capacity to the Region. This would bring the total capacity to 649.62 mgd. The five plants that have expansion plans in place would also increase the available capacity in the Region. The expansion plans would add an additional 89.5 mgd of capacity, bringing the total capacity to 739.12 mgd. Please refer to Table 5-15 for a breakdown of each county and the Regional totals.

Table 5-15: Planned WWTP Capacity Increases in the Region

	Capacity Increase (mgd) (Expansion Plans)	Current Design Capacity	Future Design Capacity
Broward County	76.0	275.62	351.62
Miami-Dade County	13.5	374.0	387.5
Region	**89.5**	**649.62**	**739.12**

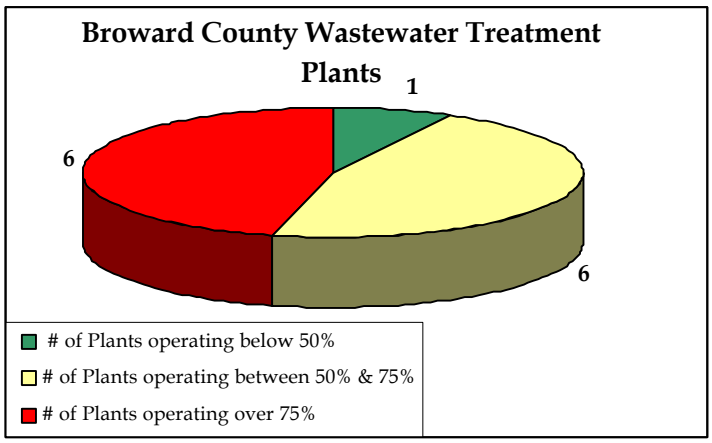
Source: SFRPC, Broward County, Miami-Dade County

2. Broward County

There are thirteen wastewater treatment plants in Broward County. The total permitted capacity in the County is 275.62 million gallons per day (mgd) and the average annual daily flow is 209.32 mgd. The County as a whole is operating at 77.2% of its permitted capacity during average annual daily flow. Using 75% as the backlog point, there is a current backlog of 7.94 mgd of capacity during average annual daily demand. Using 50% as the backlog standard, there is a current backlog of 147.49 mgd of capacity in Broward County.

Six of the thirteen plants have operation rates between 50% and 75% of their permitted capacity, and another six plants have operating rates greater than 75% of their permitted capacity. One plant, the South Broward (Southwest) WWTP, has not yet reached the 50% threshold, but is approaching that mark. Figure 5-7 illustrates this information. Table 5-16 lists the wastewater treatment plants in Broward County with their operating rates.

Figure 5-7: Operating Rates of Broward County Wastewater Treatment Plants



Source: SFRPC

Table 5-16: Broward County WWTP Average Annual Dailey Demand Operating Rates

Permit #	Plant Name	Permitted Capacity	Avg. Annual Daily Flow	Operating Rate
FL0031771	Broward County N. Regional WWTF	80.0	69.83	87.3%
FL0041289-001 FL00169617-001	City of Margate East & West WWTP	10.1	6.42	63.6%
FLA013575	City of Pembroke Pines WWTF	9.5	6.5503	69.0%
FL0040398	Cooper City Utilities	3.44	2.7	78.5%
FLA041301	Coral Springs Improvement District	8.33	5.01	60.1%
FLA013583	Ferncrest Utilities	0.6	0.48	80.0%
FLA041378	G.T. Lohmeyer Plant (Ft. Lauderdale)	55.7	34.493	61.9%
FL0026255	Hollywood Southern Regional WWTP	48.75	42.5	87.2%
FLA040401	Plantation Regional WWTP	18.9	17.5	92.6%

Table 5-16: Broward County WWTP Average Annual Dailey Demand Operating Rates (Cont.)

Permit #	Plant Name	Permitted Capacity	Avg. Annual Daily Flow	Operating Rate
FLA013580	S. Broward (Southwest) WWTF	0.99	0.47	47.5%
FLA042641	Sawgrass Regional WWTF #3 (Sunrise #3)	20.0	11.97	59.9%
FLA041947	Springtree Regional WWTF (Sunrise #1)	10.0	8.2	82.0%
FL0040541	Town of Davie WWTP	4.85	3.2	66.0%
	Broward County	**271.16**	**209.32**	**77.2%**

Source: SFRPC, Broward County, City of Margate, City of Pembroke Pines, City of Cooper City, Coral Springs Improvement District, Ferncrest Utilities, City of Fort Lauderdale, City of Hollywood, City of Plantation, City of Sunrise

There are three plants in Broward County that have surplus capacity, and thus the ability to re-rate. The re-rating of the three plants would equal 4.46 mgd. This would bring the total permitted capacity in Broward County up to 275.62 mgd, and bring the operating rate down to 75.9%. Table 5-17 shows the plants that are eligible for re-rating.

Table 5-17: WWTP's in Broward County with Permitted Capacity Less Than Design Capacity

Plant Name	Design Capacity	Permitted Capacity	Surplus Capacity	Current Operating Rate	Operating Rate with re-rating
Broward County N. Regional WWTF	84.0	80.0	4.0	87.3%	83.1%
Cooper City Utilities	3.75	3.44	0.31	78.5%	72.0%
Town of Davie WWTP	5.0	4.85	0.15	66.0%	64.0%

Source: SFRPC, Broward County, City of Cooper City, Town of Davie

There are also three facilities that have expansion plans in place to increase their capacity. The expansions would increase the wastewater capacity in the County by 76.0 mgd. This would bring the total capacity in the County to 351.62 mgd. Please see Table 5-18 for information on each of these plants.

Table 5-18: WWTP's in Broward County with Planned Capacity Increases

Plant Name	Capacity Increase (mgd)	Current Design Capacity	Future Design Capacity
Broward County N. Regional WWTF	20.0	84.0	104.0
Hollywood Southern Regional WWTP	54.0	48.75	102.75
Town of Davie WWTP	2.0	5.0	7.0

Source: SFRPC, Broward County, City of Hollywood, Town of Davie

3. Miami-Dade County

Four wastewater treatment plants are located in Miami-Dade County, with three of the plants operated by Miami-Dade County Water and Sewer Department (WASD). The total permitted capacity of the plants is 374.0 mgd, with an annual average daily flow of 275.0 mgd. The overall operating rate of the County is 73.5%. There is currently excess capacity in the amount of 7.3 mgd, in the County when using the 75% operating rate at the backlog point. When the 50% operating rate is used, there is a current backlog of 176.00 mgd of capacity in Miami-Dade County.

Two of the four plants have current operating rates between 50% and 75%, with the other two plants operating above 75%. Each plant and their operating rates are shown in Table 5-19.

Table 5-19: Miami-Dade County WWTP Average Annual Daily Demand Operating Rates

Permit #	Plant Name	Permitted Capacity	Avg. Annual Daily Flow	Operating Rate
DO13241707	Central District WWTP (WASD	143.0	101.01	70.6%
FLA03609	City of Homestead WWTF	6.0	4.73	78.8%
FL0032182-001	N. District WWTP (WASD)	112.5	84.99	75.5%
FLA042137-002	South District WWTP (WADS)	112.5	84.27	74.9%
	Miami-Dade County	**374.0**	**275.0**	**73.5%**

Source: SFRPC, Miami-Dade County, City of Homestead

There are no plants in Miami-Dade County that have the ability to re-rate. Two of the four plants within Miami-Dade County have expansion plans in place to increase their capacity. The total of the expansions is 13.5 mgd. This would bring the total capacity in the County to 387.5 mgd. See Table 5-20 for information on each of these plants.

Table 5-20: Miami-Dade County WWTPs with Planned Capacity Increases

Plant Name	Capacity Increase (mgd)	Current Design Capacity	Future Design Capacity
City of Homestead WWTF	6.0	6.0	12.0
N. District WWTP (WASD)	7.5	112.5	120.0

Source: SFRPC, Miami-Dade County, City of Homestead

4. Monroe County

There is no countywide wastewater treatment system in place within Monroe County. There are several small package plants and on-site treatment systems. These systems were not analyzed due to their small size and site-specific use. Please refer to page 26 and Appendix C for additional information on the wastewater systems in Monroe County.

C. STORMWATER

Twenty-six surface water management basins exist in Broward and Miami-Dade Counties. To determine the existing backlog or service deficiency for each of the basins, the runoff for three rain events was calculated and compared to the capacity of the last drainage structure in the primary canal before the canal empties into the either the Biscayne Bay or the ocean. The end result was the time, in days, it would take for that water to drain through the drainage structure.

The first step in calculating the runoff was to determine the amount of impervious surface in each basin. The amount of land area (in acres) in each land use category was calculated utilizing existing land use coverage provided by the South Florida Water Management District in a Geographic Information System. Using the Miami-Dade County Department of Environmental Resource Management's (DERM) XP-SWMM (Surface Water Management Model), a value was assigned to each land use category in the basin in order to determine the amount of impervious surface. This was then converted into the percent of each basin that was impervious. For a complete list of land use categories and the amount of impervious surface in each basin, please see Appendix D.

The next step taken was to determine which storm events to use when calculating the runoff. Three were chosen, the worst-case scenario, a 3-day, 100-year event, the best-case scenario, a 1-day, 3-year event; the third event was in between those two, a 3-day, 1-year event. Based on the District's rainfall maps, an average amount of rainfall per each event was chosen for each basin. See Appendix D for further information on the rainfall amounts per storm event.

The final piece of information needed before the calculations could be run, was the depth to water table information for each basin. The total amount of water, which can be stored in a certain soil profile, is expressed as a function of the depth to the water table. It was assumed that a basin with predominately sandy soil on higher ground has a wet season depth to the water table of 4 feet; that basins predominated by low, mucky soil had a depth to the water table of 2 feet; and basins with a mixture of the two had an average wet season depth to the water table of 3 feet. Based on the table below, conversions were made.

Depth to Water Table (Feet)	Cumulative Water Storage[13] (Inches)
1	0.60
2	2.50
3	6.60
4	10.90

The following information on calculating runoff is from the District's Surface Water Management Design Aids manual, pg. D-1 to D-2. A method for estimation of runoff from rainfall information has been developed by the United States Department of Agriculture's Soil Conservation Service (SCS).

[13] Source: South Florida Water Management District, Surface Water Management Design Aid, Pg. E-1

The runoff equation used by the SCS is presented in the U.S. Soil Conservation Service's *National Engineering Handbook*, Section 4, "Hydrology." The relationship between accumulated rainfall and accumulated runoff was derived from experimental data for numerous soils, vegetative cover, and treatment measures.

The equation is:

$$Q = \frac{(P - Ia)^2}{(P - Ia) + S}$$

where

Q = Accumulated direct runoff (inches)
P = Accumulated rainfall (inches)
Ia = Initial abstraction including surface storage, interception, and infiltration prior to runoff (inches)
S = Potential maximum retention (inches)

For the purpose of developing project-specific runoff generation relationships, District staff applied this formula using a weighted soil moisture storage value for the maximum retention parameter, S. For example, if a project had the ability to store 6.0 inches of rainfall in the soil profile and it was 50% impervious, then for purposes of calculating the cumulative runoff volumes, use an S value of:

6.0 inches x (1 – 0.50) = 3.0 inches

The relationship between Ia and S was developed from experimental watershed data. The empirical relationship used in the SCS runoff equation is:

Ia = 0.2S

The above equations were run for each of the 26 basins in Broward and Miami-Dade Counties. Please see Appendix D for calculations.

Once the equations were utilized to determine runoff for each basin, Q was first converted into acre feet, then into cubic feet. This number was then divided by the design Q for the drainage structure (expressed as a capacity of cubic feet per second) and finally divided by the number of seconds in a day (86,400) to determine the number of days it would take for water from a particular storm event to drain through the drainage structure. The sections below show, in tables, the time it would take for runoff from each of the chosen rain events to drain through the drainage structure.

1. Broward County

The 14 canals and their corresponding basins in Broward County are: C-10, C-11 East, C-11 West, C-12, C-13 East, C-13 West, C-14 East, C-14 West, Coral Reef, Hillsboro Canal, North Fork New River, North New River Canal East, North New River Canal West, and Pompano Canal. Two of the canal basins, C-10 and Coral Reef, do not have control structures. Because of this, there was no basin design capacity with which to compare the calculations. For those canal basins that are divided into East/West basins, for the purpose of the calculations, they were added together to

get one final calculation, with the exception of the C-11, which has been designed to backpump into Water Conservation Area 3B to the west.

C-11 East Basin

The S-13 stage divide structure is the final structure that the water must pass through in the C-11 east basin before it drains. The design discharge, in cubic feet per second (cfs), for the S-13 is 540 cfs. Table 5-21 below shows the time it takes for the runoff from each storm event to drain through the S-13 and into the South Fork of the New River and the Dania Cut-off Canal.

Table 5-21: Time It Takes For The C-11 East Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	4.69
3-day, 10-year	9.49
3-day, 100 year	18.28

Source: SFRPC, SFWMD

C-11 West Basin

The S-9 stage divide structure is the final structure that the water must pass through in the C-11 west basin before it drains. The design discharge for the S-9 is 2880 cfs. Table 5-22 below shows the time it takes for the runoff from each storm event to drain through the S-9 and into Water Conservation Area 3B.

Table 5-22: Time It Takes For The C-11 West Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	2.49
3-day, 10-year	5.71
3-day, 100 year	9.63

Source: SFRPC, SFWMD

C-12 Basin

The S-33 stage divide structure is the final structure that the water must pass through in the C-12 basin before it drains. The design discharge for the S-33 is 920 cfs. Table 5-23 below shows the time it takes for the runoff from each storm event to drain through the S-33 and into the North Fork of the New River.

Table 5-23: Time It Takes For The C-12 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	1.35
3-day, 10-year	3.34
3-day, 100 year	6.36

Source: SFRPC, SFWMD

C-13 East and West Basins

The S-36 stage divide structure is the final structure that the water must pass through in the C-13 basin before it drains. The design discharge for the S-36 is 1560 cfs. Table 5-24 below shows the time it takes for the runoff from each storm event to drain through the S-36 and into the Middle River System.

Table 5-24: Time It Takes For The C-13 East and West Basins To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	2.22
3-day, 10-year	4.79
3-day, 100 year	8.12

Source: SFRPC, SFWMD

C-14 East and West Basins

The S-37A stage divide structure is the final structure that the water must pass through in the C-14 basins before it drains. The design discharge for the S-37A is 3890 cfs. Table 5-25 below shows the time it takes for the runoff from each storm event to drain through the S-37A and into Cypress Creek.

Table 5-25: Time It Takes For The C-14 East and West Basins To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	1.77
3-day, 10-year	3.97
3-day, 100 year	6.81

Source: SFRPC, SFWMD

Hillsboro Canal Basin

The Deerfield Lock (G-56) stage divide structure is the final structure that the water must pass through in the Hillsboro basin before it drains. The design discharge for the G-56 is 1600 cfs. Table 5-26 below shows the time it takes for the runoff from each storm event to drain through the G-56 and into the Intracoastal Waterway.

Table 5-26: Time It Takes For The Hillsboro Canal Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	5.56
3-day, 10-year	16.35
3-day, 100 year	30.91

Source: SFRPC, SFWMD

North New River Canal East and West Basins

The Sewell Lock (G-54) stage divide structure is the final structure that the water must pass through in the North New River basin before it drains. The design discharge for the G-54 is 1300 cfs. Table 5-27 below shows the time it takes for the runoff from each storm event to drain through the G-54 and into the South Fork of the New River.

Table 5-27: Time It Takes For The North New River East And West Basins To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	3.19
3-day, 10-year	5.81
3-day, 100 year	10.24

Source: SFRPC, SFWMD

Pompano Canal Basin

The G-57 stage divide structure is the final structure that the water must pass through in the Pompano Canal basin before it drains. The design discharge for the G-57 is 375 cfs. Table 5-28 below shows the time it takes for the runoff from each storm event to drain through the G-57 and into the Intracoastal Waterway.

Table 5-28: Time It Takes For The Pompano Canal Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	1.52
3-day, 10-year	4.77
3-day, 100 year	8.25

Source: SFRPC, SFWMD

2. Miami-Dade County

The 17 canals and their corresponding basins in Miami-Dade County are: C-1, C-100, C-102, C-103, C-111, C-2, C-4, C-5, C-6, C-7, C-8, C-9 East, C-9 West, Coral Gables, Florida City, Homestead, and Model Land. The C-9 basin, divided into East/West basins, for the purpose of the calculations were added together to get one final calculation.

C-1 Canal Basin

The S-21 stage divide structure is the final structure that the water must pass through in the C-1 canal basin before it drains. The design discharge for the S-21 is 2560 cfs. Table 5-29 below shows the time it takes for the runoff from each storm event to drain through the S-21 and into Biscayne Bay.

Table 5-29: Time It Takes For The C-1 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	1.25
3-day, 10-year	3.80
3-day, 100 year	7.21

Source: SFRPC, SFWMD

C-100 Canal Basin

The S-123 stage divide structure is the final structure that the water must pass through in the C-100 canal basin before it drains. The design discharge for the S-123 is 2300 cfs. Table 5-30 below shows the time it takes for the runoff from each storm event to drain through the S-123 and into Biscayne Bay.

Table 5-30: Time It Takes For The C-100 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	0.98
3-day, 10-year	3.39
3-day, 100 year	5.59

Source: SFRPC, SFWMD

C-102 Canal Basin

The S-21A stage divide structure is the final structure that the water must pass through in the C-102 canal basin before it drains. The design discharge for the S-21A is 1330 cfs. Table 5-31 below shows the time it takes for the runoff from each storm event to drain through the S-21A and into Biscayne Bay.

Table 5-31: Time It Takes For The C-102 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	1.06
3-day, 10-year	3.63
3-day, 100 year	7.21

Source: SFRPC, SFWMD

C-103 Canal Basin

The S-20F stage divide structure is the final structure that the water must pass through in the C-103 canal basin before it drains. The design discharge for the S-20F is 2900 cfs. Table 5-32 below shows the time it takes for the runoff from each storm event to drain through the S-20F and into Biscayne Bay.

Table 5-32: Time It Takes For The C-103 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	0.50
3-day, 10-year	2.55
3-day, 100 year	4.54

Source: SFRPC, SFWMD

C-111 Canal Basin

The S-332 and S-197 stage divide structures are the final structures that the water must pass through in the C-111 canal basin before it drains. The design discharge for the S-332 is 165 cfs and the design discharge for the S-197 is 550 cfs, for a total of 715 cfs.. Table 5-33 below shows the time it takes for the runoff from each storm event to drain through the S-332 and S-197 and into Taylor Slough and Manatee Bay respectively.

Table 5-33: Time It Takes For The C-111 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	11.73
3-day, 10-year	42.10
3-day, 100 year	68.80

Source: SFRPC, SFWMD

C-2 Canal Basin

The S-22 stage divide structure is the final structure that the water must pass through in the C-2 canal basin before it drains. The design discharge for the S-22 is 1915 cfs. Table 5-34 below shows the time it takes for the runoff from each storm event to drain through the S-22 and into Biscayne Bay.

Table 5-34: Time It Takes For The C-2 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	1.96
3-day, 10-year	6.17
3-day, 100 year	11.42

Source: SFRPC, SFWMD

C-4 Canal Basin

The S-25 and S-25B stage divide structures are the final structures that the water must pass through in the C-4 canal basin before it drains. Because of frequent flood episodes, a stormwater storage area with a backpumping facility has been installed in the western part of this basin to increase its capacity. The design discharge for the S-25 is 260 cfs and the design discharge for the S-25B is 2000 cfs, for a total of 2260 cfs. Table 5-35 below shows the time it takes for the runoff from each storm event to drain through S-25 and S-25B and into the Comfort Canal and Miami River respectively.

Table 5-35: Time It Takes For The C-4 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	3.26
3-day, 10-year	8.71
3-day, 100 year	15.21

Source: SFRPC, SFWMD

C-5 Canal Basin

The S-25 stage divide structure is the final structure that the water must pass through in the C-5 canal basin before it drains. The design discharge for the S-25 is 260 cfs. Table 5-36 below shows the time it takes for the runoff from each storm event to drain through S-25 and into the Miami River.

Table 5-36: Time It Takes For The C-5 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	0.52
3-day, 10-year	1.75
3-day, 100 year	3.32

Source: SFRPC, SFWMD

C-6 Canal Basin

The S-26 stage divide structure is the final structure that the water must pass through in the C-6 canal basin before it drains. The design discharge for the S-26 is 3470 cfs. Table 5-37 below shows the time it takes for the runoff from each storm event to drain through S-26 and into the Miami River.

Table 5-37: Time It Takes For The C-6 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	1.83
3-day, 10-year	3.77
3-day, 100 year	7.33

Source: SFRPC, SFWMD

C-7 Canal Basin

The S-27 stage divide structure is the final structure that the water must pass through in the C-7 canal basin before it drains. The design discharge for the S-27 is 2800 cfs. Table 5-38 below shows the time it takes for the runoff from each storm event to drain through S-27 and into the Little River and Biscayne Bay.

Table 5-38: Time It Takes For The C-7 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	0.95
3-day, 10-year	2.03
3-day, 100 year	4.07

Source: SFRPC, SFWMD

C-8 Canal Basin

The S-28 stage divide structure is the final structure that the water must pass through in the C-8 canal basin before it drains. The design discharge for the S-28 is 3220 cfs. Table 5-39 below shows the time it takes for the runoff from each storm event to drain through S-28 and into Biscayne Bay.

Table 5-39: Time It Takes For The C-8 Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	0.66
3-day, 10-year	1.45
3-day, 100 year	2.95

Source: SFRPC, SFWMD

C-9 East and West Basins

The S-29 stage divide structure is the final structure that the water must pass through in the C-9 east and west canal basins before it drains. The design discharge for the S-29 is 4780 cfs. Table 5-40 below shows the time it takes for the runoff from each storm event to drain through S-29 and into the Maule Lake/Oleta River System.

Table 5-40: Time It Takes For The C-9 East And West Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	2.18
3-day, 10-year	4.29
3-day, 100 year	7.89

Source: SFRPC, SFWMD

Coral Gables Canal Basin

The G-97 stage divide structure is the final structure that the water must pass through in the Coral Gables canal basin before it drains. The design discharge for the G-97 is 640 cfs. Table 5-41 below shows the time it takes for the runoff from each storm event to drain through G-97 and into Biscayne Bay.

Table 5-41: Time It Takes For The Coral Gables Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	1.51
3-day, 10-year	5.07
3-day, 100 year	8.93

Source: SFRPC, SFWMD

Florida City Canal Basin

The S-20F stage divide structure is the final structure that the water must pass through in the Florida City canal basin before it drains. The design discharge for the S-20F is 2900 cfs. Table 5-42 below shows the time it takes for the runoff from each storm event to drain through S-20F and into Biscayne Bay.

Table 5-42: Time It Takes For The Florida City Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	0.37
3-day, 10-year	1.32
3-day, 100 year	1.97

Source: SFRPC, SFWMD

Homestead Canal Basin

The S-20G stage divide structure is the final structure that the water must pass through in the Homestead canal basin before it drains. The design discharge for the S-20G is 900 cfs. Table 5-43 below shows the time it takes for the runoff from each storm event to drain through S-20G and into Biscayne Bay.

Table 5-43: Time It Takes For The Homestead Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	0.15
3-day, 10-year	0.76
3-day, 100 year	1.22

Source: SFRPC, SFWMD

Model Land Canal Basin

The S-20 stage divide structure is the final structure that the water must pass through in the Model Land canal basin before it drains. The design discharge for the S-20 is 450 cfs. Table 5-44 below shows the time it takes for the runoff from each storm event to drain through S-20 and into Biscayne Bay.

Table 5-44: Time It Takes For The Modal Land Basin To Drain

Storm Event	Time it takes, in days, to drain
1-day, 3-year	3.48
3-day, 10-year	12.73
3-day, 100 year	19.26

Source: SFRPC, SFWMD

VI. TASK 6 - DEMAND ANALYSIS

Task 6 utilizes the data gathered in previous tasks to identify the future demand for water and wastewater services in the Region. The data collected was extrapolated out to 2030 in 5-year increments, starting with 2005. In order to best provide local governments, the District, and the Regional Planning Council, with long range planning data, a per capita demand approach was used to determine future demand. Three different population projections were used in all calculations, USACE, CERP Update, 2003, University of Florida BEBR, 02/2004, and projections provided by each County.

Based on conversations with SFWMD staff, stormwater demand analysis was not performed, because demand for stormwater management is a condition of each individual project that is undertaken.

A. Methodology

In order to determine the demand for water and wastewater in the future, the data collected was converted into a per capita number for both maximum day demand and average annual daily demand. This was done by dividing the total maximum day demand and average annual daily demand for each county by the 2004 population for that county. The same was done for the Region as a whole. The result is a series of per capita numbers that allows the future demand to be calculated based on the future population projections.

When extrapolating the future water demand for the County, two scenarios are used, the demand using the per capita maximum day demand and the demand given the per capita average annual daily demand.

B. WATER DEMAND

1. The Region

The Three County Region is expecting tremendous growth in the next 25 years. Based on projections, the population could grow to as many as 5,796,800 people, an increase of 1,612,615 over the current population. Table 6-1 shows the three population projections for the Region.

Table 6-1: Regional Population Projections, 2005-2030

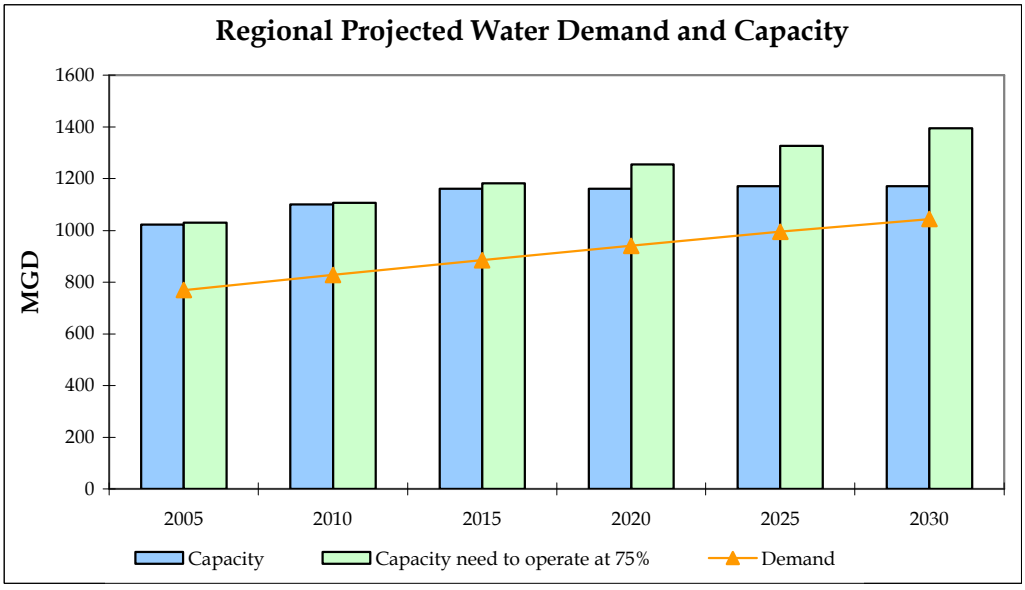
Population Projection	2005	2010	2015	2020	2025	2030
USACE, CERP (2003)	4,257,300	4,568,100	4,881,900	5,203,200	5,513,800	5,796,800
UF BEBR (02/04)	4,261,500	4,585,300	4,900,400	5,213,200	5,511,700	5,784,600
County Totals	4,280,338	4,596,092	4,910,809	5,131,471	5,438,428	5,736,079

Source: CERP, BEBR, Broward County, Miami-Dade County, Monroe County

The current demand of water in the Region is 752.579 mgd at maximum day demand, and 642.526 mgd at average annual daily demand. Using this data and the 2004 population of the Region (4,184,185), the per capita maximum day demand is 180.49 gallons per day, and the per capita average annual daily demand is 152.93 gallons per day.

Using the calculated per capita numbers for water demand, by 2030, the total regional demand for water could be as high as 1044.07 mgd, an increase of as much as 38.7% over current demand. This could pose serious problems for the Region. At this time, there are capacity increases slated for facilities across the Region that total 158.26 mgd of additional capacity. When this additional capacity is added to the current design capacity, there would be a total capacity in the Region of 1171.406 mgd. With no further additions beyond what is known, the Region would be operating at 89.3% of its capacity in 2030. Figure 6-1 compares the known capacity in the Region out to 2030 with the capacity needed to operate at 75% of permitted capacity at maximum-day demand and the calculated demand.

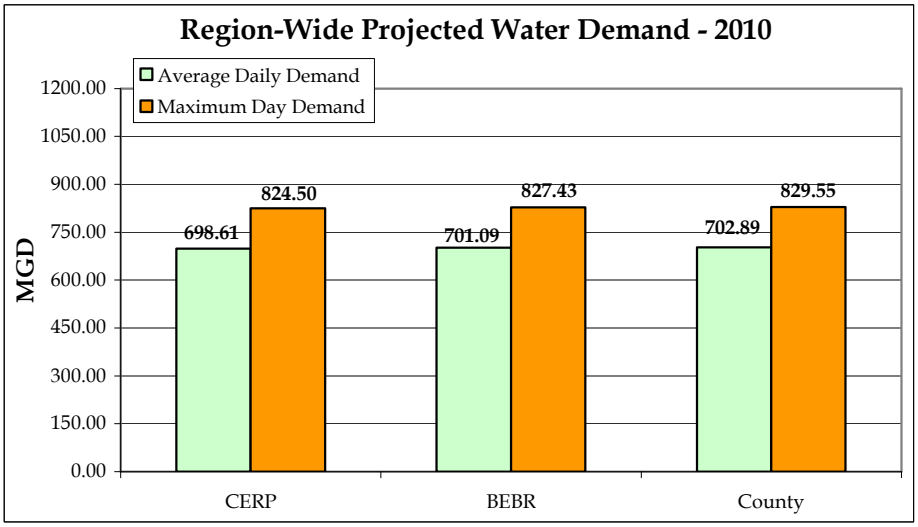
Figure 6-1: Projected Regional Water Demand And Capacity, 2005-2030



Source: SFRPC

By 2010 an as many as 411,907 additional residents could be living in the Region. This increase in population in the next 5 years would result in an increase in water demand of as much as 74.35 mgd at maximum day demand, and 62.99 mgd at average annual daily demand. This could bring the total maximum day demand to as much as 829.55 mgd, and the average annual daily demand to as much as 751.02 mgd. This is an increase in demand of as much as 9.9% over current demand. Please refer to figure 6-2 for the range of demands given for the three population projections that are being used in this analysis.

Figure 6-2: Projected Regional Water Demand, 2010



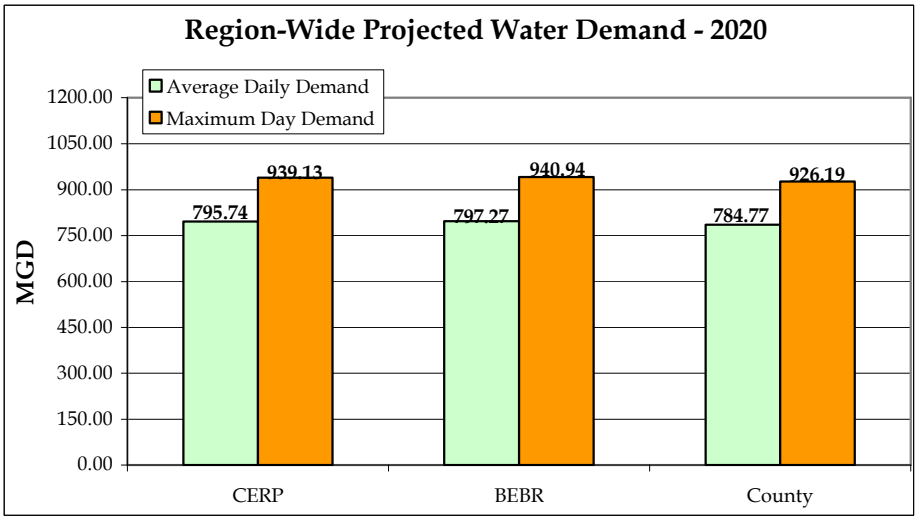
Source: SFRPC, CERP, BEBR, Broward County, Miami-Dade County, Monroe County

According to the information received from the water treatment facilities in Task 4, an additional 88.0 mgd of capacity will be added to the Region by 2010. This would bring the total design capacity to 1085.146 mgd, with operating rates of 75.3% during maximum day demand, and 63.8% at average annual daily demand. The maximum day rate would put the Region right at the point of concern in 2010 during maximum day demand.

In order for the Region to operate at 75% in 2010, additional capacity, beyond what is currently planned, would have to be added. As much as 4.92 mgd of additional capacity would have to be added, putting the total capacity in the Region at 1106.07 mgd.

By 2020, the population of the Region could be as high as 5,213,200, an increase of more than one million people from current population, and an increase of as many as 635,100 people from 2010. These additional people will require as much as an additional 114.63 mgd of water at maximum day demand, and 97.13 mgd at average annual daily demand. This is an increase in demand of as much as 24.2% over current demand. The additional water demand would bring the total maximum day demand to as much as 940.94 mgd, and the total average annual daily demand to as high as 797.27 mgd. Figure 6-3 shows the range of demands projected for 2020.

Figure 6-3: Projected Regional Water Demand, 2020



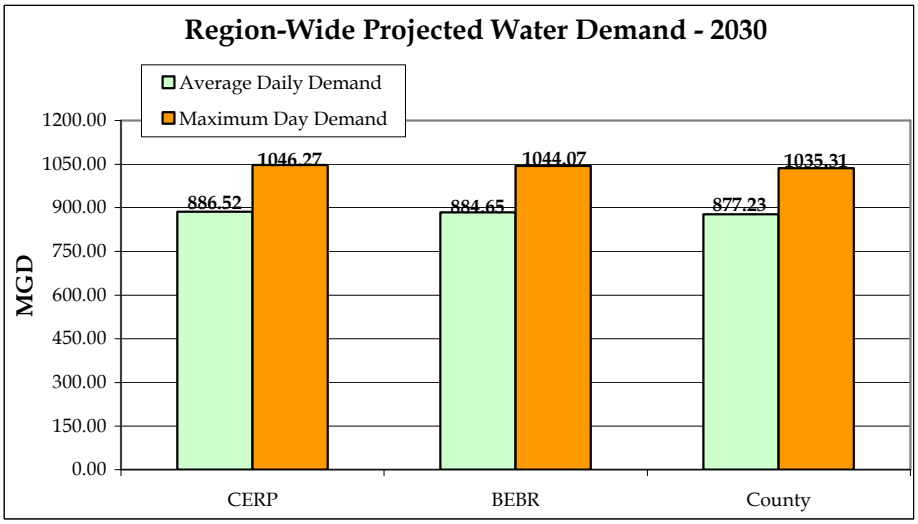
Source: SFRPC, CERP, BEBR, Broward County, Miami-Dade County, Monroe County

According to the information received from the water treatment facilities in Task 4, an additional 60.26 mgd of capacity will be added to the Region between 2010 and 2020. This would bring the total design capacity to 1161.406 mgd, with operating rates of 81.0% during maximum day demand, and 68.6% at average annual daily demand. The maximum day rate would put the Region over the point of concern (operating at more than 75% at maximum day demand) in 2020 during maximum day demand.

In order for the Region to be operating at 75% of the total capacity at maximum day demand in 2020, an additional 88.26 mgd of capacity would need to be added to the facilities. This additional capacity would put the total capacity in the Region at 1254.59 mgd.

Between 2020 and 2030 the Region is expected to grow by as many as 604,608 people, giving the Region a total population of as many as 5,796,800. The additional population will generate as much as 109.13 mgd of water at maximum day demand, and 92.46 mgd at average annual daily demand. As mentioned before, this is an increase of as much 38.7% over current demand. The additional demand could bring the total maximum day demand to as high as 1046.27 mgd at maximum day demand, and 886.52 mgd at average annual daily demand. See Figure 6-4 for the range of demands projected for 2030.

Figure 6-4: Projected Regional Water Demand, 2030



Source: SFRPC, CERP, BEBR, Broward County, Miami-Dade County, Monroe County

The data indicates that an additional 10.0 mgd of capacity is planned for the years between 2020 and 2030. This would bring the total capacity in the Region in 2030 to 1171.406 mgd. The Region would be operating at as much as 89.3% of total capacity during maximum day demand, and at as much as 75.7% during average annual daily demand. The operating rates at both maximum day demand and average annual daily demand would be over the 75% threshold.

In order for the Region to operate at 75% of total capacity during maximum day demand in 2030, an additional 130.44 mgd capacity would need to be added. This would bring the total capacity needed in 2030 to 1395.03 mgd.

In the next 25 years, we are looking at the need for 292.39 mgd of additional capacity in the Region in order to operate at 75% of total capacity during maximum day demand. This will involve cooperation throughout the Region, in terms of both funding and planning. In the next two sections of this report, Tasks 7 and 8, the cost of this undertaking will be discussed as well as new funding approaches.

2. Broward County

It is anticipated that by 2030 the population of Broward County will grow to more than 2.5 million people. This is an increase of more than 800,000 people over the next 25 years. The demand that the new residents will create will be extremely taxing on the already backlogged system. Table 6-2 shows the three population projections for the County in five-year increments. The three projections give us high, medium, and low estimates that will be used to determine demand.

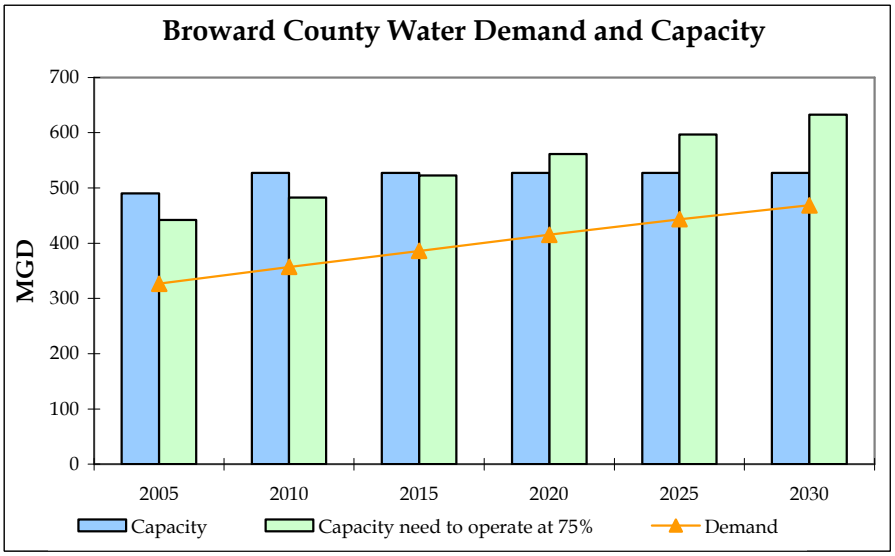
Table 6-2: Broward County Population Projections, 2005-2030

Population Projection	2005	2010	2015	2020	2025	2030
Broward County (06/02)	1,789,916	1,954,572	2,117,038	2,273,287	2,418,641	2,548,303
USACE, CERP (2003)	1,772,800	1,931,600	2,092,300	2,257,100	2,416,900	2,562,900
UF BEBR (02/04)	1,766,500	1,928,800	2,087,500	2,244,600	2,394,600	2,531,800

Source: SFRPC, CERP, BEBR, Broward County,

In the next twenty-five years, the demand for water in Broward County could increase by as much as 48.7%. This would put the total demand at 474.47 mgd during maximum day demand, and 359.92 mgd during average annual daily flow. With no additional capacity increases beyond what is currently known, the County could be operating at as much as 90.0% of capacity during maximum day demand by 2030. Figure 6-5 shows the known capacity in the County out to 2030, as well as what capacity it will take to operate at 75% of permitted capacity at maximum-day demand and the calculated demand.

Figure 6-5: Broward County Projected Water Demand And Capacity, 2005-2030



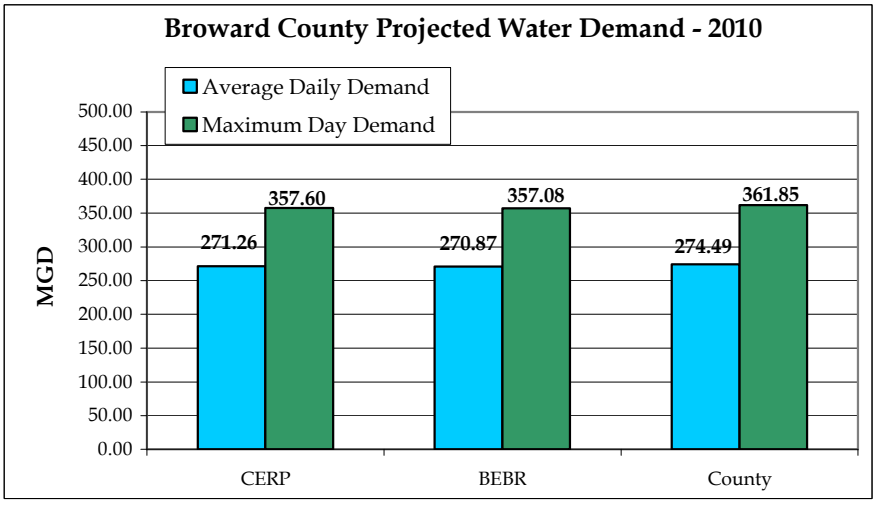
Source: SFRPC

The current demand for water in Broward County is 319.005 million gallons per day (mgd) during maximum day demand, and 241.984 mgd during average annual daily demand[14]. Twenty-eight (28) water treatment plants located throughout the County are currently meeting this demand with a total permitted capacity of 415.944 mgd. Using the methodology established above, the per capita maximum day flow for the County is 185.13 gallons per day and the per capita annual average daily flow is 140.43 gallons per day[15].

The above demand analysis is the end result of twenty-five years of growth. When taken incrementally, the growth in population, and therefore the demand for water, is less severe, but still problematic.

By 2010 the population of Broward County is projected to be in the range of 1,928,800 to 1,954,572 people. This is an increase of more than 200,000 people from 2004. This increase in population would result in an increase of water use and demand. Using per capita maximum day demand, the total demand in Broward County in 2010 could be as high as 361.85 mgd, an additional 42.85 mgd over current demand. When per capita average annual daily demand is used, the total demand could be as high as 274.49 mgd, an increase of as much as 32.5 mgd. The additional demand represents an increase of as much as 13.4% over current demand. Figure 6-6 shows the range of projected demands in 2010.

Figure 6-6: Broward County Projected Water Demand, 2010



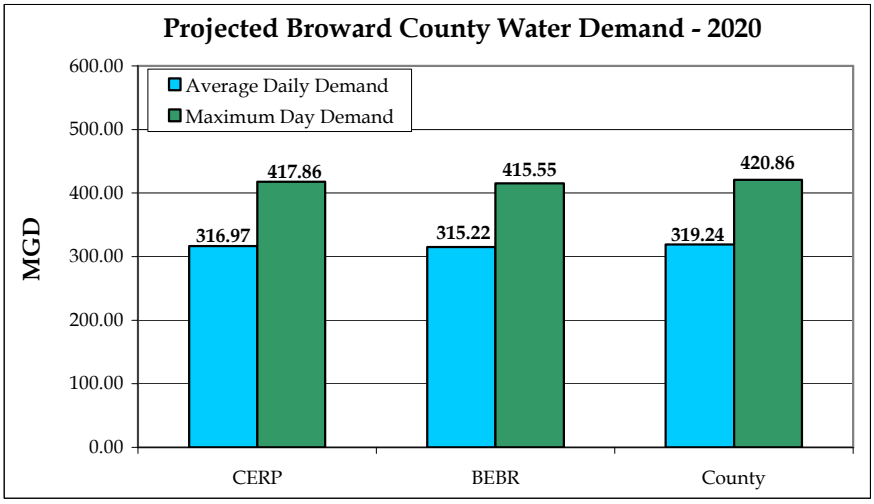
Source: SFRPC, CERP, BEBR, Broward County

Between 2010 and 2020 the population of Broward County is projected to increase by as much 325,500 people, giving the County a population of as many as 2,273,287 people in 2020. Using per capita maximum day demand, the resulting additional water demand could be as much as 60.26 mgd. This additional water demand would bring the total water demand in 2020 to as much as

[14] For the purpose of this study, average annual daily demand refers to the total volume of water used in a year divided by 365 days.
[15] 2004 population used to calculate per capita numbers was 1,723,131.

420.86 mgd. When per capita average annual daily demand is used in the calculations, the additional demand for water could be as high as 45.71 mgd, which would bring the potential total demand in 2020 to as much as 319.24 mgd. Figure 6-7 shows the range of projected demands in 2020.

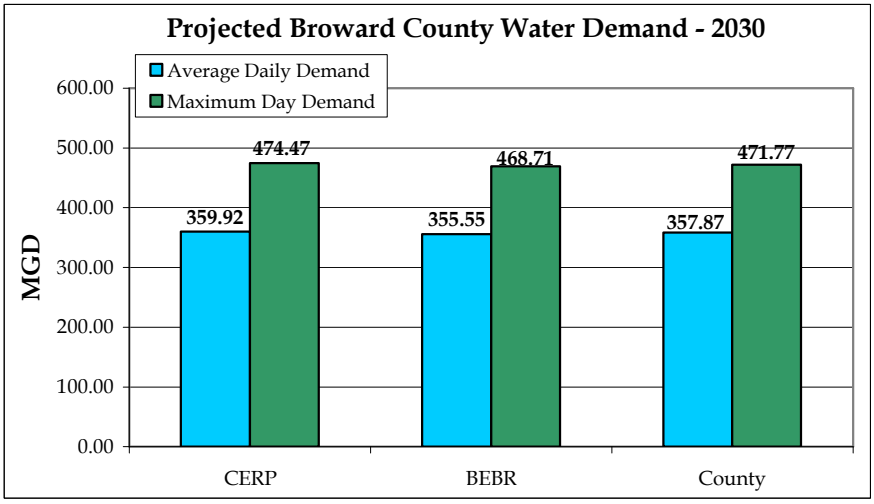
Figure 6-7: Broward County Projected Water Demand, 2020



Source: SFRPC, CERP, BEBR, Broward County

In the 10 years between 2020 and 2030 the population is expected to increase by as many as 305,800 people. This increase would bring the total population in the County to as many as 2,562,900. The additional demand for water created by the increase in population would be as much as 56.61 mgd during maximum day demand and as much as 42.94 mgd during average annual daily demand. This would bring the total maximum day demand in 2030 to as much as 474.47 mgd and the total average annual daily demand to as much as 359.93 mgd. Figure 6-8 shows the range of projected water demand for Broward County in 2030.

Figure 6-8: Broward County Projected Water Demand, 2030



Source: SFRPC, CERP, BEBR, Broward County

3. Miami-Dade County

Miami-Dade County is also expecting a tremendous amount of growth in the next twenty-five years. By 2030, the population of the County could be as high as 3,187,776[16], an increase of more than 800,000 people from the current population. Table 6-3 shows the three different population projections for the County.

Table 6-3: Miami-Dade County Population Projections, 2005-2030

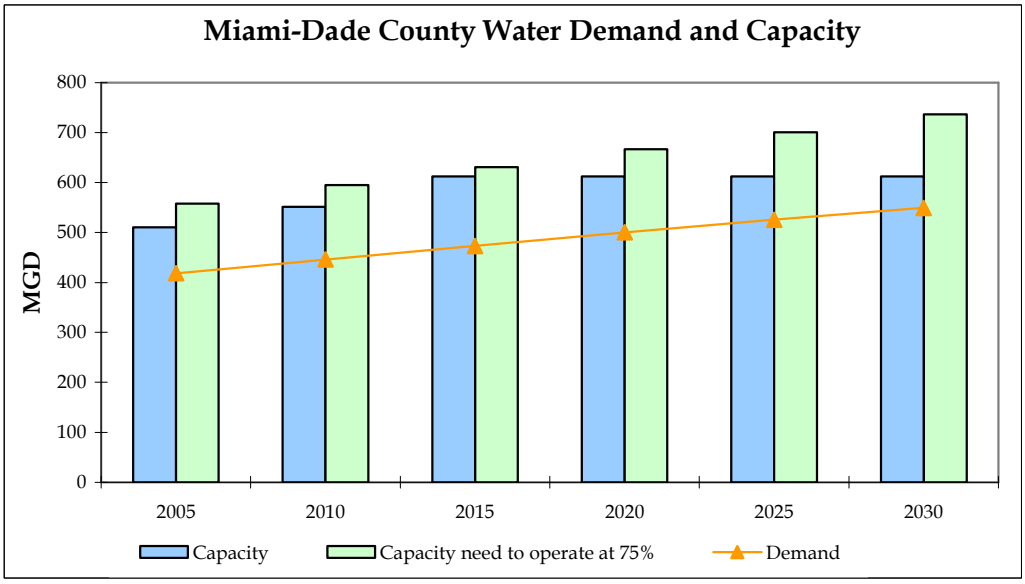
Population Projection	2005	2010	2015	2020	2025	2030
Miami-Dade County (07/04)	2,402,117	2,551,284	2,703,117	2,858,184	3,019,787	3,187,776
USACE, CERP (2003)	2,403,200	2,554,300	2,706,500	2,862,000	3,011,900	3,148,100
UF BEBR (02/04)	2,414,200	2,574,000	2,730,800	2,885,900	3,033,800	3,168,900

Source: Miami-Dade County, CERP, BEBR

The current demand for water in Miami-Dade County is 412.404 mgd during maximum day demand and 380.312 mgd during average annual daily demand. Using these figures and the 2004 population for the County (2,379,818), the per capita demand was calculated. The maximum day per capita demand is 173.29 gallons per day and the per capita average annual day demand is 159.81 gallons per day.

It is projected that the demand for water in Miami-Dade County could be as much 552.42 mgd by 2030. This is an increase of almost 34% over current demand. While the projected increase is not as large as Broward Counties, it still warrants attention. Figure 6-9 compares the known capacity in the County out to 2030 with the capacity needed to operate at 75% of permitted capacity at maximum-day demand and the calculated demand.

Figure 6-9: Miami-Dade County Projected Water Demand, 2005-2030

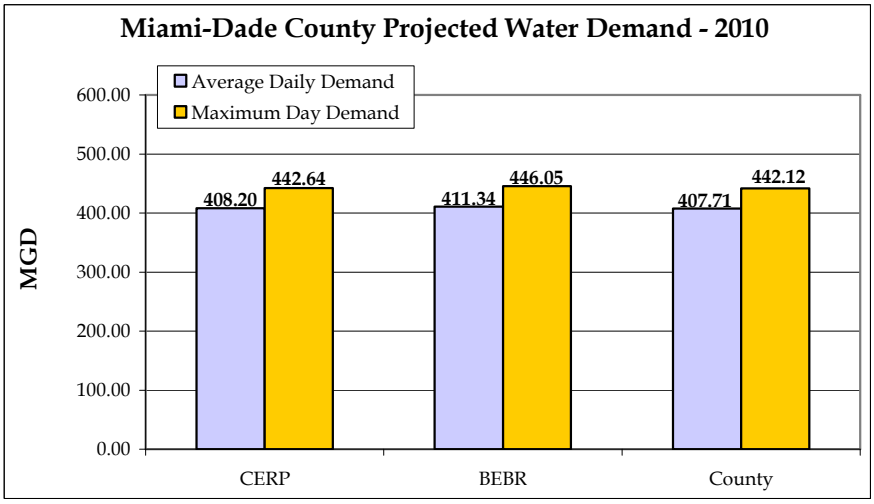


Source: SFRPC

[16] Miami-Dade County, 07/04 projection

By 2010 the population of Miami-Dade County is projected to increase by as many as 194,182 people, to just over two and a half million people. The additional water these new residents will demand could be as high as 33.65 mgd. This would bring the total projected maximum day demand to as much as 446.05 mgd. During average annual daily demand, the demand could be as high as 411.34, an increase of as much as 31.03 mgd. This additional demand represents an increase of as much as 8.2%. Figure 6-10 illustrates the range of demands projected in the County for 2010.

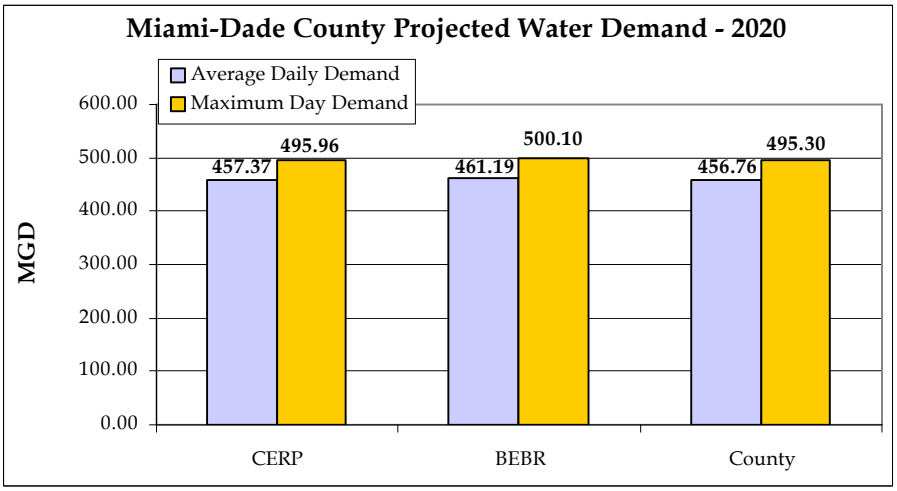
Figure 6-10: Miami-Dade County Projected Water Demand, 2010



Source: SFRPC, CERP, BEBR, Miami-Dade County

Between 2010 and 2020, it is projected that as many as 311,900 additional people will reside in Miami-Dade County. This would bring the total population in 2020 to between 2,858,184 and 2,885,900. Using the per capita maximum day demand, this increase in population would result in an additional demand of as much as 54.05 mgd. This would bring the total maximum day demand to as high as 500.10 mgd. When per capita average annual daily demand is used, the additional demand could be as much as 49.84 mgd, bringing the total average annual daily demand to as high as 461.19 mgd. By 2020, the demand could be as much as 21.3% higher than current demand. Figure 6-11 shows the range of demands that are projected for 2020.

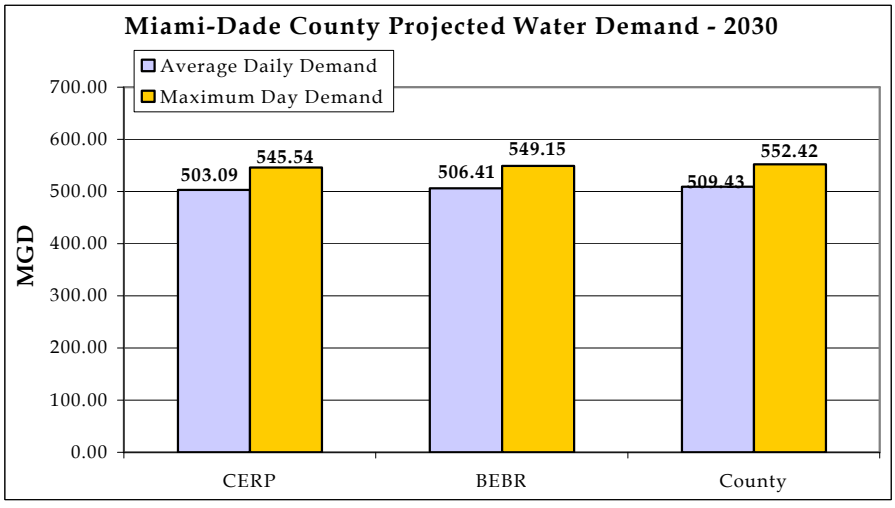
Figure 6-11: Miami-Dade County Projected Water Demand, 2020



Source: SFRPC, CERP, BEBR, Miami-Dade County

It is projected that as many as 329,592 new residents will move to Miami-Dade County between 2020 and 2030. This increase could bring the total population to as many as 3,187,776 in 2030. With this increase in population, the maximum day demand could increase by as much 57.11 mgd, to 552.42 mgd. Using per capita average annual daily demand, the increase could be as much as 52.67 mgd, bringing the total to as much as 509.43 mgd. By 2030, the increase in demand could be as much as 33.9% over current demand. Figure 6-12 shows the range of demands projected for 2030.

Figure 6-12: Miami-Dade County Projected Water Demand, 2030



Source: SFRPC, CERP, BEBR, Miami-Dade County

4. Monroe County

Monroe County is in a different position than either Broward or Miami-Dade Counties. Because of the sensitive environmental condition of the County, especially the Florida Keys, and the moratorium on building in the County in the past, it has not experienced, nor is it expected to experience, the growth rates that the other counties are expecting.

Monroe County is expected to grow by 2,664[17] to 4,564[18] people between now and 2030. The expected population in 2030 ranges from 83,900 to 85,800 people. Table 6-4 shows the various population projections for Monroe County out to 2030.

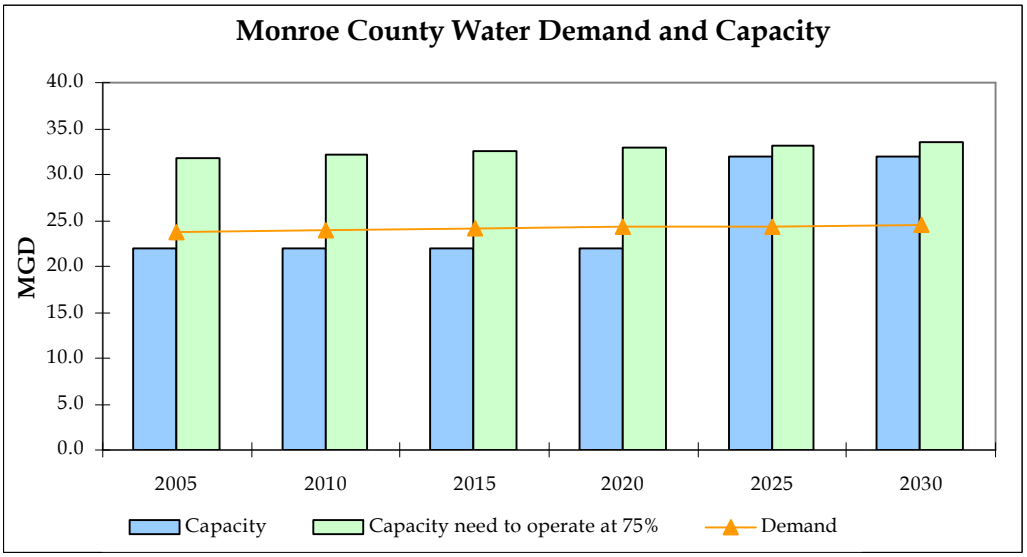
Table 6-4: Monroe County Population Projections, 2005-2030

Population Projection	2005	2010	2015	2020	2025	2030
Monroe County (1999)	88,305	90,236	90,654	N/A	N/A	N/A
USACE, CERP (2003)	81,300	82,200	83,100	84,100	85,000	85,800
UF BEBR (02/04)	80,800	81,500	82,100	82,700	83,300	83,900

Source: Monroe County, CERP, BEBR

The current demand for water in Monroe County is 23.8 mgd during maximum day demand, and 17.6 mgd at average annual daily demand. Given the 2004 population of the County (81,236), the per capita maximum day demand is 292.97 gallons per person per day, and 216.65 gallons per person per day at per capita average annual daily demand. Using these calculations, it is projected that water demand in Monroe County could be as high as 25.137 mgd at maximum day demand and 18.589 mgd at average annual daily demand in 2030. This is an increase of 5.6% over current demand. Figure 6-13 compares the known capacity in the County out to 2030 with the capacity needed to operate at 75% of permitted capacity at maximum-day demand and the calculated demand.

Figure 6-13: Monroe County Water Projected Demand And Capacity, 2005-2030

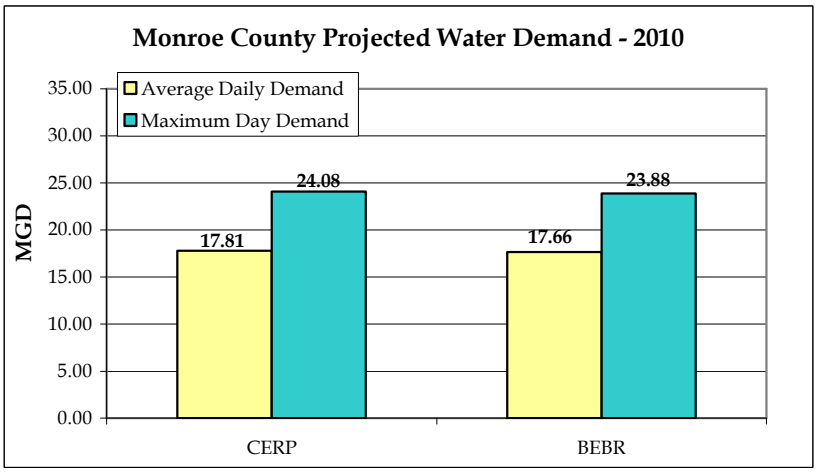


Source: SFRPC

[17] This increase is based on the UF BEBR projections that were done in 02/2004.
[18] This increase is based on the USACE, CERP Update projections that were done in 2003.

By 2010 the population in Monroe County could increase by as many as 964[19] people, bringing the total population to as high as 82,200. The additional residents will increase the total demand by 0.28 mgd at maximum day demand, and by 0.21 mgd at average annual daily demand. The total maximum day demand for 2010 would increase to as much as 24.082 mgd, and the total average annual daily demand to as much as 17.809 mgd. Figure 6-14 shows the range of demands for Monroe County in 2010.

Figure 6-14: Monroe County Projected Water Demand, 2010

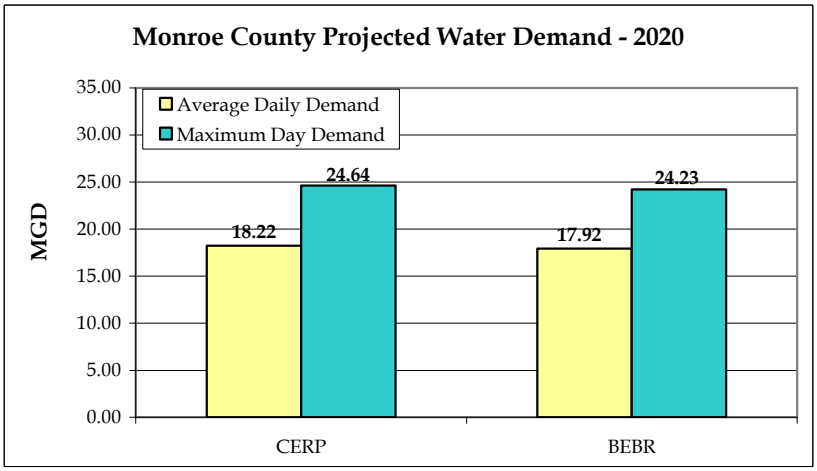


Source: SFRPC, CERP, BEBR

By 2020 the population of Monroe County is expected to increase by as many as 1,900 people, bring the total population to as high as 84,100. The additional residents will increase the demand for water by as much as 0.56 mgd at maximum day demand, and 0.41 mgd at average annual daily demand. This would bring the total maximum day demand in the County to as much as 24.639 mgd, and the total average annual daily demand to 17.971 mgd. This is an increase of as much as 3.5% over current demand. Figure 6-15 shows the range of demands in 2020.

[19] Monroe County projections are not used in the calculation due to their being so different than the other two projections. They are in Table 6-9 for information only.

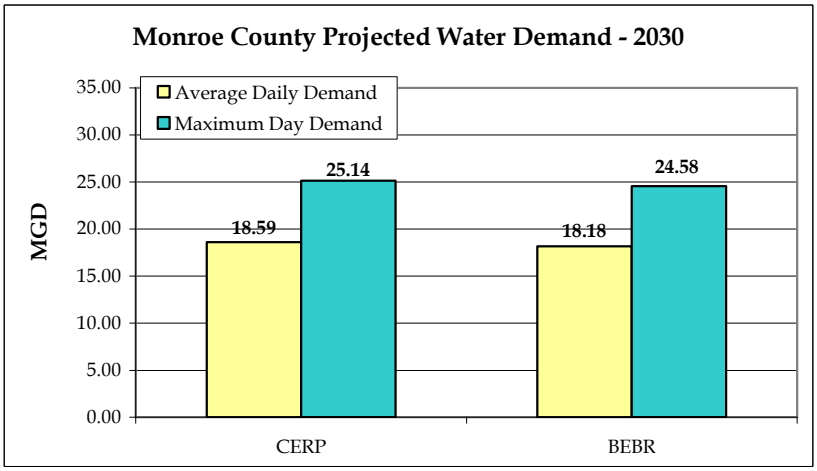
Figure 6-15: Monroe County Projected Water Demand, 2020



Source: SFRPC, CERP, BEBR

As many as 85,800 people could be living in Monroe County by 2030, an increase of as many as 1,700 people from 2020. This is an increase of as much as 5.6% over the current population. These additional residents will demand as much as 0.50 mgd in additional capacity at maximum day demand, and as much as 0.37 mgd at average annual daily demand. The 2030 demand could be as much as 5.6% higher than the current demand in Monroe County. Figure 6-16 shows the range of demands for the County in 2030.

Figure 6-16: Monroe County Projected Water Demand, 2030



Source: SFRPC, CERP, BEBR

C. WASTEWATER DEMAND

Wastewater treatment plants are permitted based on their average annual daily demand. This is the total volume of water received in a year divided by 365 days. The level of service standard for wastewater plants is average day, so average day flows, or average annual daily flows, are compared to the operative constraint of the plant. While analysis is provided for both average annual daily demand and maximum-day demand, it is the former that is the standard criteria to use when analyzing wastewater treatment plants.

The same two scenarios were used to determine future wastewater demand as were used to determine future water demand. A per capita average annual daily demand and a per capita maximum-day demand were calculated, and demand was extrapolated using the three population projections.

1. The Region

The analysis of the Region's future wastewater demand does not include Monroe County. Because the population growth in Monroe County is so small, there is a negligible difference in the overall demand projections. Therefore, the Regional analysis only includes Broward and Miami-Dade Counties.

By 2030 the total population of the Region could be as high as 5,736,079, and increase of more than 1.5 million people from the current population. Please see Table 6-5 for population projections to 2030 for the Region. The demand for wastewater services in the Region could be as high as 677.10 mgd during average annual daily flow and 1049.22 mgd during maximum day flow. This is an increase of 37.8% over the current demand. This increased demand will put additional pressure on an already taxed Regional wastewater system.

Table 6-5: Regional Population Projections, Excluding Monroe County, 2005-2030

Population Projection	2005	2010	2015	2020	2025	2030
USACE, CERP Update (2003)	4,176,000	4,485,900	4,798,800	5,119,100	5,428,800	5,711,000
UF BEBR (02/04)	4,180,700	4,502,800	4,818,300	5,130,500	5,428,400	5,700,700
County Totals[20]	4,192,033	4,505,856	4,820,155	5,131,471	5,438,428	5,736,079

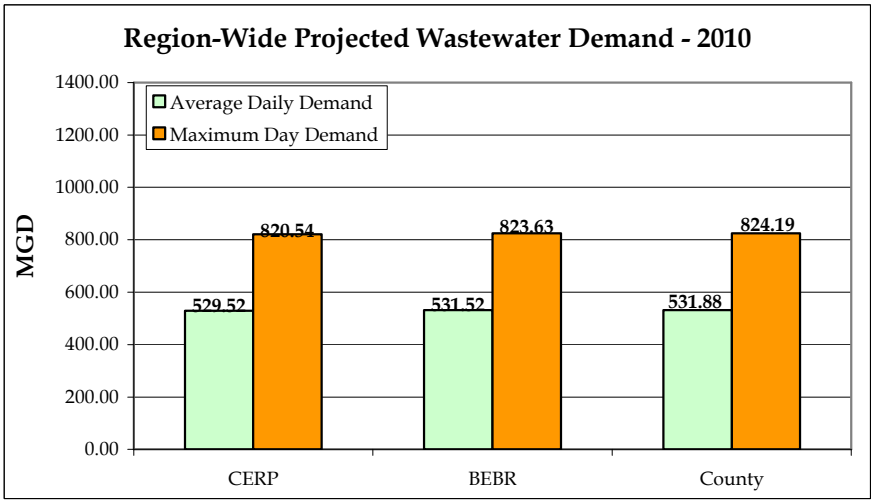
Source: CERP, BEBR, Broward County, Miami-Dade County

The current demand for wastewater services in the Region is 484.23 mgd during average annual daily flow, and 750.49 mgd during maximum day demand. The per capita use in the Region is 118.04 gallons per day during average annual flow and 182.92 gallons per day during maximum day demand. The current operating rate during average annual daily flow is 75.1% of permitted capacity, and 116.3% of permitted capacity during maximum day flow.

By 2010 the population in the Region could be as high as 4,492,033, an increase of as many as 321,671 people over the current population. The resulting increase in wastewater demand would be as much as 37.97 mgd during average annual daily flow, and 58.84 mgd during maximum day flow. The total demand in 2010 could be as high as 531.88 mgd during average annual daily flow, and 824.19 mgd during maximum day flow. This is an increase of as much as 7.8% over the current Regional demand. Figure 6-17 shows the range of demands projected for the Region in 2010.

[20] Includes only Broward and Miami-Dade Counties

Figure 6-17: Projected Regional Wastewater Demand, 2010

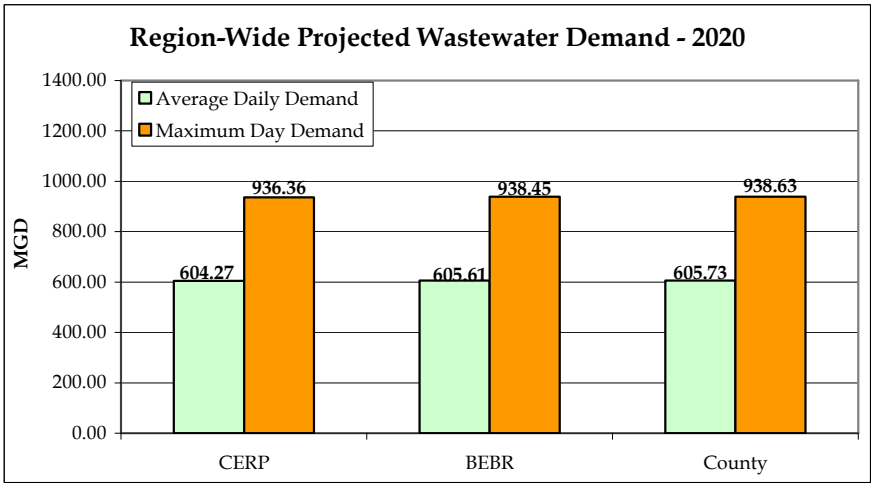


Source: SFRPC, CERP, BEBR, Broward County, Miami-Dade County

According to data obtained in previous tasks, an additional 89.5 mgd of capacity will be added to the Region's wastewater facilities between now and 2010. These additions will bring the total capacity in the Region to 739.12 mgd. The additions would result in a decrease in operating rates for the Region as a whole. During average annual daily demand, the Region would be operating at 72.0% of capacity. While this is under the backlog threshold that has been determined, it is still very close to that mark and should be carefully monitored.

By 2020 the population in the Region could be as high as 5,131,471, an increase of as many as 633,200 people over the 2010 population, and 947,286 people over the current population. The increase in wastewater demand from 2010 to 2020 could be as much as 74.74 mgd at average annual daily flow and as much as 115.82 mgd at maximum day flow. This is an increase of as much as 14.1% over 2010 demand. The increase in demand from the current demand could be as high as 111.82 mgd at average annual daily flow and 173.28 mgd at maximum day flow. The 2020 demand could be as much as 23.1% over current demand. The total demand in 2020 could be as high as 605.73 mgd during average annual daily flow and 938.63 mgd during maximum day demand. Figure 6-18 shows the range of demands projected for 2020

Figure 6-18: Projected Regional Wastewater Demand, 2020

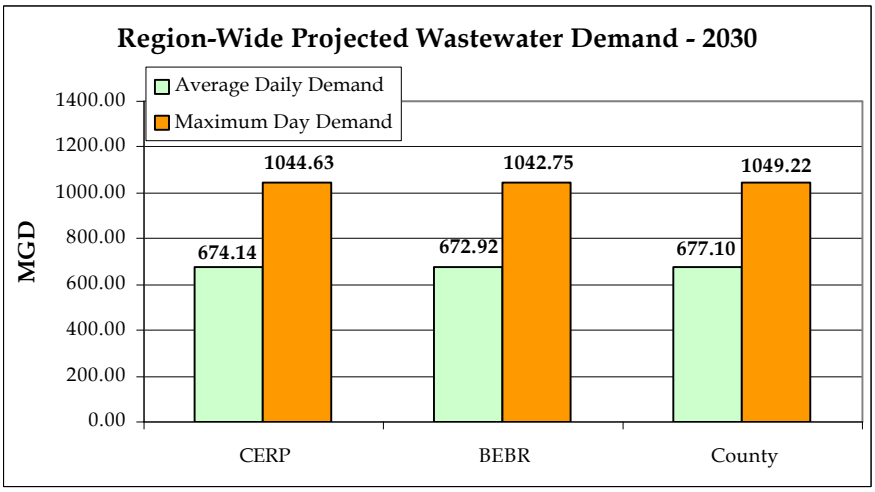


Source: SFRPC, CERP, BEBR, Broward County, Miami-Dade County

According to the data, there is no additional capacity planned for the Region's wastewater facilities between 2010 and 2020. The total Regional capacity in 2020 would remain at 739.12 mgd. With the additional demand that will be put on the Regional system, the operating rate in 2020 could be as high as 82.0% of permitted capacity during annual average daily flow. This is over the 75% threshold that has been established as point at which backlog begins. In order to operate at75%, 68.52 mgd of capacity would be needed in the Region. This would bring the total capacity to 807.64 mgd.

By 2030 the Region's population could be as high as 5,736,079. This is an increase of as many as 604,608 people over the 2020 population, and 1,551,894 people over the current population. The increase in wastewater demand generated by the population increase from 2020 to 2030 could be as much as 71.37 mgd during average annual daily flow, and 110.59 mgd during maximum day flow. This is an increase of 11.8% over the 2020 demand. The increase from current demand could be as much as 183.19 mgd during average annual daily flow, and 283.87 mgd during maximum day flow. This is an increase of 37.8% over the current demand. The total demand in 2030 could be as high as 677.10 mgd during average annual daily flow and 1049.22 mgd during maximum day flow. Figure 6-19 shows the range of demands projected for 2030.

Figure 6-19: Projected Regional Wastewater Demand, 2030



Source: SFRPC, CERP, BEBR, Broward County, Miami-Dade County

According to the data collected, there is no additional capacity planned for the Region's wastewater facilities between 2020 and 2030. The total Regional capacity in 2030 would remain at 739.12 mgd. With the additional demand generated, the operating rate in 2030 could be as high as 91.6% of permitted capacity during average annual daily flow. This is well above the established backlog threshold that has been established. In order to operate at 75%, 163.68 mgd of capacity would need to be added to the Region. This would bring the total capacity in the Region to 902.80 mgd.

2. Broward County

By 2030 there could potentially be more than 2.5 million people in Broward County. This is an increase of more than 800,000 people over the current population. As with water, these new residents will demand additional wastewater services. Please refer to Table 6-1 on page 127 for Broward County population projections to 2030.

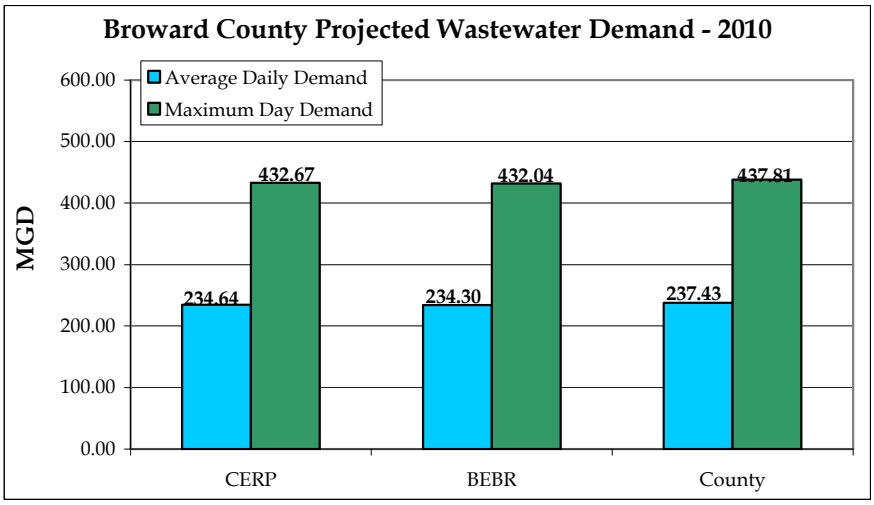
The current demand for wastewater treatment in Broward County is 209.32 mgd during average annual daily demand and 385.973 mgd during maximum-day demand. The per capita wastewater use in Broward County at average annual daily demand is 121.48 gallons per day and 224.0 gallons per day at maximum day demand. As was discussed in Task 5, the current operating rates in the County are 77.2% of permitted capacity during average annual daily demand and 142.3% of permitted capacity during maximum-day demand. With the addition of up to 800,000 people in the next 25 years, the already strained wastewater system will only become more backlogged.

The demand for wastewater in Broward County could potentially increase by as much as 48.7% by 2030. This would mean an increase in demand of as much as 102.02 mgd during average annual daily demand and 188.11 mgd during maximum-day demand. This could bring the total demand to more than 311.33 mgd during average annual daily demand and 574.08 mgd during maximum-day demand.

Taken incrementally, the projected wastewater demand in Broward County is less daunting than when 25 years of population growth are taken all at once.

By 2010 the total population of Broward County could be as high as 1,954,572, an increase of over 200,000 people from the current population. The increase in population would result in an increase in wastewater demand by as much as 24.98 mgd at average annual daily demand and 46.07 mgd at peak or maximum day demand. This would bring the total maximum day demand to as high as 437.81 mgd and the total average annual daily demand to as much as 237.43 mgd. The increase in total wastewater demand from the current demand to 2010 could be as high as 12.1%. Figure 6-20 shows the range of projected wastewater demands in 2010.

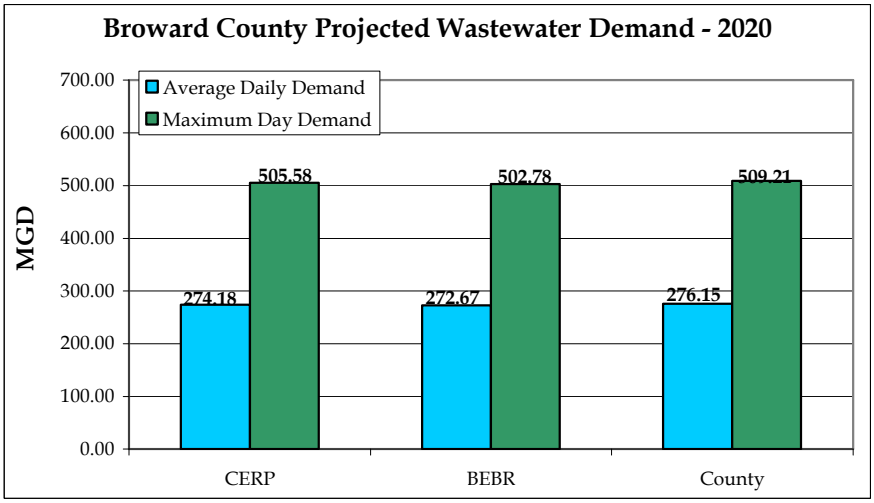
Figure 6-20: Broward County Projected Wastewater Demand, 2010



Source: SFRPC, CERP, BEBR, Broward County

By 2020 the total population of Broward County could be as high as 2,273,287, an increase of as many as 325,500 people over the 2010-projected population and as many as 550,156 people over the current population. The increase in population will increase the demand for wastewater. The increase in demand from 2010 to 2020 could be as much as 39.54 mgd at average annual daily demand, and 72.91 mgd at maximum day demand, an increase of 16.7% over 2010 demand. The increase in demand could be as much as 66.83 mgd over current demand at average annual daily demand and 123.24 mgd at maximum day demand, an increase of 31.0%. The total demand for wastewater in 2020 could be as high as 276.15 mgd during average annual daily demand and 509.21 mgd at maximum day demand. Figure 6-21 shows the range of demands in 2020.

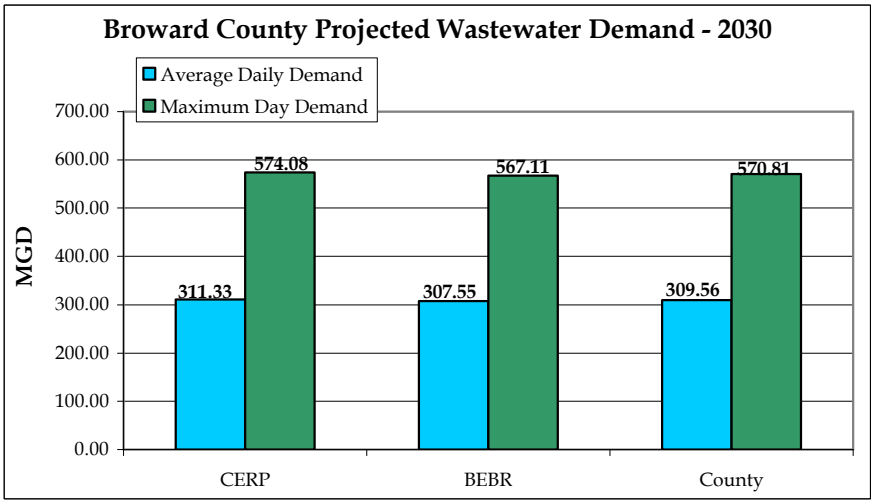
Figure 6-21: Broward County Projected Wastewater Demand, 2020



Source: SFRPC, CERP, BEBR, Broward County

By 2030 the population of the County could be as high as 2,562,900. This is an increase of as many as 305,800 people from 2020, and 839,769 over the current population. The increase in wastewater demand from 2020 to 2030 could be as much as 37.15 mgd at average annual daily demand and 68.50 mgd at maximum day demand. This is an increase of 13.5% over 2020 demand. The increase in demand from the current demand could be as much as 102.02 mgd at average annual daily demand and 188.11 mgd at maximum day demand, an increase of 48.7%. The total demand for wastewater in 2030 could be as high as 311.33 mgd during average annual daily demand and 574.08 mgd at maximum day demand. Figure 6-22 shows the range of wastewater demands in 2030.

Figure 6-22: Broward County Projected Wastewater Demand, 2030



Source: SFRPC, CERP, BEBR, Broward County

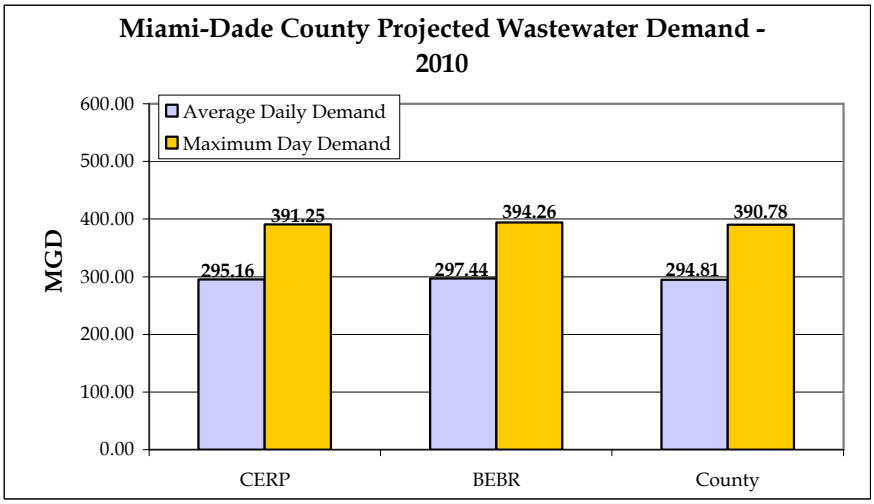
3. Miami-Dade County

By 2030 the population of Miami-Dade County could be as high as 3,187,776. This is an increase of more than 800,000 over the current population. These new residents will require as much as 123.75 mgd of additional wastewater service, a 34% increase over current demand. Please see Table 6-3 for population projections to 2030 for Miami-Dade County.

The current demand for wastewater treatment in Miami-Dade County is 275.0 mgd during average annual daily demand and 364.52 mgd during maximum-day demand. The per capita wastewater use in the County at average annual daily demand is 115.56 gallons per day and 153.17 gallons per day at maximum day demand. As was discussed in Task 5, the current operating rates in the County are 73.5% of permitted capacity during average annual daily demand and 97.5% of permitted capacity during maximum-day demand. While the County is not operating at levels as high as Broward County, it is still above the backlog threshold, and the additional demand will only compound the problem.

By 2010 the total population in Miami-Dade County could be as high as 2,574,000. This is an increase of as many as 194,182 people over the current population. The increase in population would result in an increase of wastewater services by as much as 22.44 mgd during average annual daily flow, and 29.74 mgd during maximum day flow. The increase would bring the total maximum day demand to as high as 394.26 mgd, and the total average annual daily demand to as high as 297.44. The projected 2010 total demand could be as much 8.2% over current demand. Figure 6-23 shows the range of projected demands for 2010.

Figure 6-23: Miami-Dade County Projected Wastewater Demand, 2010

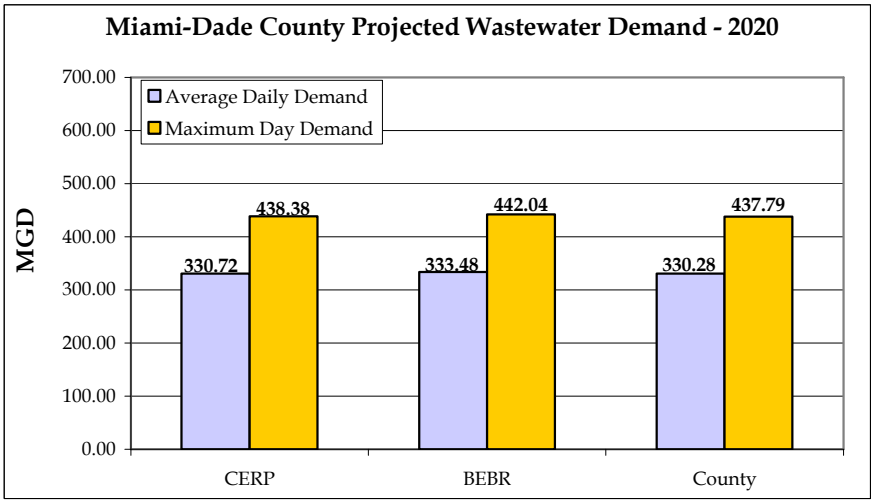


Source: SFRPC, CERP, BEBR, Miami-Dade County

By 2020 the total population of Miami-Dade County could be as high as 2,885,900. This is an increase of as many as 311,900 people from 2010 and 506,082 people from the current population. The result of the population increase is an increase of as much as 36.04 mgd of wastewater demand during average annual daily flow from 2010, and 58.48 mgd from the current demand. When maximum day demand is analyzed, we find that the increase could be as much as 47.77 mgd from the 2010 demand, and 77.52 mgd from the current demand. The increase over 2010 demand is as much as 12.1%, and the increase over current demand is as much as 21.3%. The

total demand in 2020 may be as high as 333.48 mgd during average annual daily flow and 442.04 mgd during maximum day flow. Figure 6-24 shows the range of wastewater demands projected for 2020.

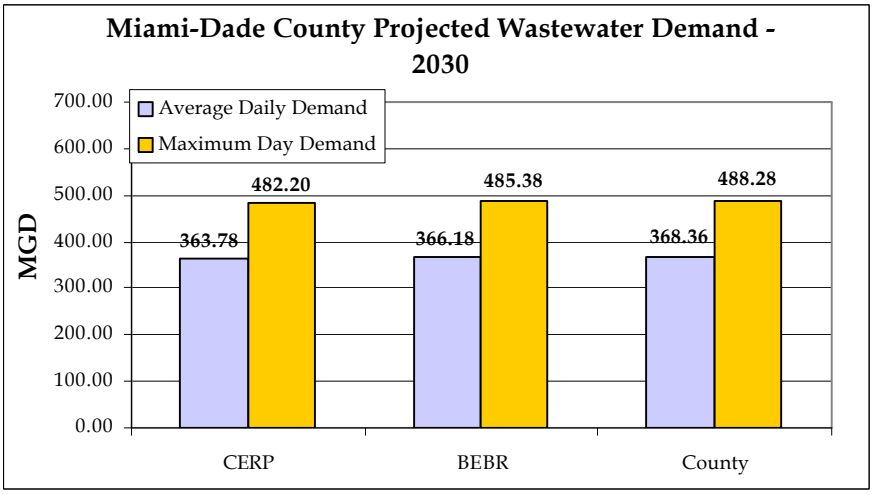
Figure 6-24: Miami-Dade County Projected Wastewater Demand, 2020



Source: SFRPC, CERP, BEBR, Miami-Dade County

The increase in population from 2020 to 2030 could be as many as 329,592 people, and the increase from the current population could be as many as 807,958 people. This would put the 2030 population as high as 3,187,776. The additional demand created from 2020 to 2030 could be as much as 38.09 mgd during average annual daily flow and 50.48 mgd during maximum day flow. This is an increase of 11.4% over 2020 demand. The increase over current demand could be as much as 93.37 mgd during average annual daily flow and 123.75 mgd during maximum day flow. This is an increase of as much as 34.0% over the current demand. The total demand in 2030 could be as high as 368.36 mgd during average annual daily flow, and 488.28 mgd during maximum day flow. Figure 6-25 shows the range of projected wastewater demands for 2030.

Figure 6-25: Miami-Dade County Projected Wastewater Demand, 2030



Source: SFRPC, CERP, BEBR, Miami-Dade County

D. Case Study: State Road 7 Redevelopment

The State Road 7 Master Plan is one of the most ambitious and comprehensive redevelopment plans within the region. Initial projections provided by the Urban Land Institute (ULI) indicate that the Broward County portion of the corridor could accommodate nearly 20 percent of the County's growth by the year 2020, including over 29,000 residential units; 10 million square feet of office; 7 million square feet of flex space; 3 million square feet of retail; and 4 thousand hotel rooms.

This potential development scenario could generate a demand of over 11 mgd of water and wastewater by the year 2020. This development would occur over a 25-mile area that is served by twelve water treatment service providers and seven wastewater treatment providers.

Collectively, the water treatment facilities have a permit capacity of 244 mgd and a peak flow of 178 mgd and appear to have sufficient capacity to accommodate the projected growth and demand at each facility.

Wastewater facilities have a collective permit capacity of 218 mgd and an average flow of 174 mgd and peak flows exceed current permit capacities. Expansions to facility treatment capacity will be necessary where capacity is limited. For example, the Town of Davie and the City of Hollywood will need to ensure that planned expansions occur in order facilitate the level of redevelopment that could occur in these portions of the corridor.

Additional refinements in the amounts, geographic distribution, and timing of the development along the State Road 7 corridor is underway and will be calibrated to specific service areas in order to determine impacts upon individual facilities. This information collected in this study will be vital in conducting this assessment.

VII. TASK 7 - COST ANALYSIS

Task 7 utilizes the estimates derived in Tasks 5 and 6 to estimate the future costs to provide services needed to sustain future growth in South Florida. Examples of water and wastewater expansion projects from around the county were used to estimate the cost of expansion in the Region. Cost estimates were determined by finding what capacity would be needed in order for the Region's water system to operate at 75% and for the Region's wastewater system to operate at 75% and 50% of permitted capacity.

Different factors are used to determine the operating rates of water and wastewater plants. Water Treatment plants use maximum day demand to determine the plants permitted capacity, while wastewater treatment plants use average annual daily demand.

The estimates of back and future demand, found in Tasks 5 and 6, were used to calculate the estimated cost of future needs. A cost per million gallons of capacity increase was determined for each project that was found.

There is a range of improvements that can be made to increase a plant's capacity and/or efficiency. To estimate this, a survey of plants from around the county was conducted to get a cost estimate for plant capacity increases. Each plant will need detailed engineering studies to determine the best methods to increase plant capacity.

In accordance with conversations with SFWMD staff, a cost analysis for stormwater management systems was not performed. Each stormwater management project has many localized factors that make it nearly impossible to perform a cost analysis on a Region-Wide basis.

A. Water Treatment Plants

Four examples of water treatment plant expansion projects from around the country were found and used to estimate the cost to provide the needed water capacity for future growth in the Region. Three examples from Florida are used. The first cost estimates used are based on data from the Miami-Dade Department of Water and Sewer Department's *Water Facilities Master Plan, September 2003* report. The second cost estimate is based on the most recent expansion at the Hollywood Water Treatment Plant. The third estimate is based on a project by the City of San Diego[21], and the forth-cost estimate is based on the Lee County Florida Corkscrew WTP expansion project[22].

Currently, there is an estimated backlog of 117.31 mgd in the Region. This represents the capacity that is needed for the Region to operate at 75% of permitted capacity during maximum day demand. The total capacity needed in the Region, in order to operated at 75% would be 1006.95 mgd. By 2010 4.92 mgd of additional capacity will be needed to operate at 75% of total capacity[23] during maximum day demand. By 2020 an additional 88.26 mgd capacity will be needed, and by 2030, 130.44 mgd of additional capacity will be needed in the Region in order to operate at 75% of total capacity during maximum day demand. Table 7-1 illustrates the above information in greater detail.

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[21] Source: City of San Diego, http://www.sandiego.gov/water/cip/miramar.shtml

[22] Source: Lee County, Florida

[23] Total capacity includes the surplus capacity in the Region, as defined in Task 5, as well as the known capacity increases that plants are planning for.

Table 7-1: Region-wide Water Capacity Needs, 2010-2030

	Capacity (mgd)	Peak Operating Rate	Total Capacity Needed to Operate at 75% during Peak (mgd)	Additional Capacity needed (mgd)
Current Capacity	889.634	84.9%	1006.95	117.31
2010 Capacity	1101.146	75.3%	1106.07	4.92
2020 Capacity	1161.406	81.0%	1254.59	93.18
2030 Capacity	1171.406	89.3%	1395.03	223.62

Source: SFRPC

According to the *Water Facilities Master Plan*, Miami-Dade County is proposing to re-rate two of their water treatment plants. At the Hialeah-Preston Plant, the Department is proposing a re-rate to 235 mgd (an increase of 10 mgd) and water quality treatment improvements at Hialeah and Preston. The total cost of this is estimated to be $91 million. The cost per million gallons of capacity added is $9.1 million.

The second project the County is proposing is the re-rate and expansion of the Alexander Orr Treatment Plant. The re-rate will increase the total capacity at the plant by 60.26 mgd, to 278 mgd. The total cost of this project is estimated to be $25 million. The cost per million gallons of capacity added is $0.42 million.

According to the Master Plan, opinions of cost developed for these capital improvements are expressed as "order-of-magnitude", meaning they are made without detailed engineering drawings and are expected to be accurate within a range of 30 percent below and 50 percent above actual costs. The opinions of costs shown are prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final cost of the project will depend of multiple conditions, including actual labor and material costs, comparative market conditions, final project costs, implementation schedule, and other variable factors.[24]

Using the costs from the two Miami-Dade County projects, estimates of the total price to eliminate the current backlog were calculated. As stated above, an additional 117.31 mgd of capacity is needed in the Region in order to operate at 75% of permitted capacity during maximum-day demand. Based on the cost estimates for the first Miami-Dade County project (Estimate #1), $9.1 million per million gallons of capacity added, the estimated cost would be $1,067,521,000. The low estimate, 30% below cost, would be $747,264,700 and the high estimate, 50% above cost, would be $1,601,281,500.

The cost for the second Miami-Dade County project, expansion plans at the Alexander Orr Plant (Estimate #2), is $0.42 million per million gallons of added capacity. The cost estimate for the current backlog would be $49,270,200. The low estimate would be $34,489,140 and the high estimate is $73,905,300. Table 7-2 shows the cost estimates for the needed capacity to eliminate the current backlog.

[24] Miami-Dade Water and Sewer Department, Water Facilities Master Plan, pg. 12-1.

Table 7-2: Cost Estimates, Based On Estimates #1 And #2, To Eliminate Current Water Backlog

Year	Needed Capacity to Operate at 75% during Maximum Day Demand	Cost based on expansion plans at Hialeah-Preston Plant	Cost based on expansion plans at the Alexander Orr Plant
Current Backlog	117.31	$1,067,521,000	$49,270,200
	30% below Cost	$747,264,700	$34,489,140
	50% above Cost	$1,601,281,500	$73,905,300

Source: SFRPC, Miami-Dade Water and Sewer Department, *Water Facilities Master Plan*, Pg. 12-2

Using the same costs as above, the cost estimates were calculated for the future capacity needed in the Region. By 2010, 4.92 mgd of additional capacity will be needed in order to operate at 75% of capacity during maximum day demand. Using Estimate #1, the cost for this is $44,772,000, with a low estimate of $31,340,400 and a high estimate of $67,158,000. Using Estimate #2, the cost is $2,066,400 with a low estimate of $1,446,480 and a high estimate of $3,099,600.

By 2020 an additional 88.26 mgd of capacity will need to be added in the Region. Using Estimate #1, the cost of adding this capacity will be $803,166,000. The low estimate, 30% below cost, is $562,216,200, and the high estimate is $1,204,749,000. Using Estimate #2 the cost would be $37,069,200. The low estimate is $25,948,440 and the high estimate is $55,603,800.

By 2030, an additional 130.44 mgd of capacity will need to be added in the Region. Using Estimate #1, the cost estimate is $1,187,004. The low estimate is $830,902,800 and the high estimate is $1,780,506,000. Using Estimate #2, the cost estimate equals $54,784,800. The low cost estimate is $38,349,360 and the high cost estimate is $82,177,200.

Overall, in the next 25 years, a total of 223.62 mgd of capacity will need to be added in the Region in order to operate at 75% of capacity during maximum day demand. The cost of this using Estimate #1 would be $3,102,463,000, with a low cost estimate of $2,171,724,100 and a high estimate of $4,653,694,500. Using Estimate #2, the cost would be $143,191,600. The low estimate would be $100,233,420 and the high estimate would be $214,785,900.

Table 7-3: Water Cost Estimates 2010-2030, Based On Estimates #1 And #2

Year	Needed Capacity to Operate at 75% during Maximum Day Demand	Cost based on expansion plans at Hialeah-Preston Plant (#1)	Cost based on expansion plans at the Alexander Orr Plant (#2)
2010	4.92	$44,772,000	$2,066,400
2020	88.26	$803,166,000	$37,069,200
2030	130.44	$1,187,004,000	$54,784,800
TOTAL	**223.62**	**$3,102,463,000**	**$143,190,600**

Source: SFRPC, Miami-Dade Water and Sewer Department, *Water Facilities Master Plan*, Pg. 12-2

The other local project used to estimate future costs was the expansion of the Hollywood Water Treatment Plant (Estimate #3). This was an 18-month, $27 million expansion that was completed in 1996. The project entailed the addition of a Membrane/Reverse Osmosis Plant. This plant works in tandem with the existing lime-softening plant. The Membrane treatment may produce up to 14 mgd of finished water and the up to 4 mgd of finished water may be produced by the

Reverse Osmosis treatment, for a total of 18 mgd of additional treatment capability. The cost per million gallons of additional capacity is $1.5 million. Using this example, the estimated cost to eliminate the current backlog of 117.31 mgd would be $175,965,000. The high estimate is $228,754,500 and the low estimate is $123,175,500.

Table 7-4: Cost Estimates, Based On Estimate #3, To Eliminate Current Water Backlog

Year	Needed Capacity to Operate at 75% during Maximum Day Demand	Cost based on Estimate #3
Current Backlog	117.31	$175,965,000
	30% below Cost	$123,175,500
	30% above Cost	$228,754,500

Source: SFRPC, City of Hollywood

Between 2010 and 2030, 223.62 mgd of additional capacity will be needed in the Region in order to operate at 75% of permitted capacity during maximum-day demand. Based on the cost of the Hollywood Water Treatment Plant expansion project, the estimated cost for the needed capacity would be $511,395,000. The low estimate of the cost, 30% below cost, is $136,962,000, and the high cost estimate, 30% above cost, is $254,358,000. Table 7-5 shows the cost based on the 10-year needs.

Table 7-5: Water Cost Estimates 2010-2030, Based On Estimate #3

Year	Needed Capacity to Operate at 75% during Maximum Day Demand	Cost based on Estimate #3
2010	4.92	$7,380,000
2020	88.26	$132,390,000
2030	130.44	$195,660,000
TOTAL	**223.62**	**$511,395,000**

Source: SFRPC, City of Hollywood

A comparison of Water Treatment Plant expansion costs for the region also considered expenditures in other rapidly growing areas. The Miramar Water Treatment Plant Upgrade and Expansion project in San Diego, California, is the first of these projects used to estimate future expansion cost. According to the City, the benefits of this project are: increased capacity and reliability to meet current and future water needs. The capacity of the plant will be increased to 215 mgd from 140 mgd, and increase of 75 mgd. The project will also allow the plant to meet or exceed new, stricter drinking water standards, and utilize state-of-the-art equipment and technology to increase the longevity of the plant. The total cost of this project is estimated to be $135 million. The cost per million gallons of capacity added is $1.8 million.

Using the cost estimate from the Miramar WTP in San Diego (Estimate #4), the cost to eliminate the current backlog (117.31 mgd) would be $211,158,000. The low estimate, 30% below cost, would be $147,810,600. The high estimate, 30% above cost, would be $316.737.000.

Table 7-6: Cost Estimates, Based On Estimate #4, To Eliminate Current Water Backlog

Year	Needed Capacity to Operate at 75% during Maximum Day Demand	Cost based on Estimate #4
Current Backlog	117.31	$211,158,000
	30% below Cost	$147,810,600
	30% above Cost	$316,737,000

Source: SFRPC, City of San Diego Water Department

Using Estimate #4, the cost to add the additional 4.92 mgd of capacity that will be needed by 2010 would be $8,856,000. The low estimate would be $6,199,200, and the high estimate would be $13,284,000.

By 2020, an additional 88.26 mgd of capacity will be needed throughout the Region in order to operate at 75% of capacity during maximum day demand. The cost of this using Estimate #34would be $158,868,000. The low cost estimate is $111,207,600 and the high cost estimate is $238,302,000.

An additional 130.44 mgd of capacity will be needed by 2030 in order to keep up with population growth in the Region. The cost of this additional capacity-using Estimate #4 is $234,792,000. The low estimate is $164,354,400 and the high estimate is $352,188,000.

A total of 223.62 mgd of capacity will need to be added in the Region in order to keep pace with growth and maintain an operating rate of 75% of total capacity during maximum day demand. Using Estimate #4 the cost of this is $402,516,000. The low estimate is $281,761,200 and the high estimate is $523,270,800.

Table 7-7: Water Cost Estimates 2010-2030, Based On Estimate #4

Year	Needed Capacity to Operate at 75% during Maximum Day Demand	Cost based Estimate #4
2010	4.92	$8,856,000
2020	88.26	$158,868,000
2030	130.44	$234,792,000
TOTAL	**223.62**	**$402,516,000**

Source: SFRPC, City of San Diego Water Department

The third project used to estimate future costs was the Lee County, Florida Corkscrew Water Treatment Plant Expansion (Estimate #5). The project consists of the expansion of the existing plant from 10.038 mgd to 15.058 mgd, an increase of 5.02 mgd of capacity. The project is expected to cost $13 million. The primary intent of the project is to improve the county's water supply capacity and provide the system with greater operational flexibility. The cost per million gallons is $2.59 million.

Using Estimate #5, the cost to eliminate the current backlog of 117.31 mgd in the Region would be $303,832,900. The low estimate would be $212,683,030 and the high estimate would be $455,749,350.

Table 7-8: Cost Estimates, Based On Estimate #5, To Eliminate Current Water Backlog

Year	Needed Capacity to Operate at 75% during Maximum Day Demand	Cost based on Estimate #5
Current Backlog	117.31	$303,832,900
	30% below Cost	$212,683,030
	30% above Cost	$455,749,350

Source: SFRPC, Lee County, FL

A total of 223.62 mgd of additional capacity will be needed in the Region by 2030, not including the additional capacity that is needed to eliminate the current backlog. The cost of this, using Estimate #4 is $579,175,800. The low cost estimate is $405,423,060 and the high estimate is $752,928,540. Table 7-9 shows the breakdown in cost per 10-year period.

Table 7-9: Water Cost Estimates 2010-2030, Based On Estimate #5

Year	Needed Capacity to Operate at 75% during Maximum Day Demand	Cost based Estimate #5
2010	4.92	$12,742,800
2020	88.26	$228,593,400
2030	130.44	$337,839,600
TOTAL	**223.62**	**$579,175,800**

Source: SFRPC, Lee County, FL

Based on the projects described above, the estimated cost of adding the needed 223.62 mgd of capacity in the Region by 2030 could range from a high of $3,102,463,000 to a low of $143,190,600. These are both from the Miami-Dade County projects. Table 7-10 shows the five cost estimates for the cost of providing the 223.62 mgd of capacity.

Table 7-10: Cost Comparison Between 5 Estimates

	Estimate #1	Estimate #2	Estimate #3	Estimate #4	Estimate #5
TOTAL COST	$3,102,463,000	$143,190,600	$511,395,000	$402,516,000	$579,175,800

Source: Miami-Dade County, City of Hollywood (FL), City of San Diego (CA), Lee County (FL)

B. Wastewater Treatment Plants

Three wastewater treatment plant expansion projects were found from across the country. Unfortunately, no local projects could be found. The estimated costs of these projects were used to calculate a cost estimate for providing the needed capacity within the Region to accommodate future growth. The first cost estimate is based on the Southeast Michigan Council of Government's (SEMCOG) report, "Investing in Southeast Michigan's Quality of Life: Infrastructure Needs." The second cost estimate is based on the expansion project at the Empire Wastewater Treatment Plant in Dakota County, MN. The third project used to estimate expansion costs was the Michigan Road Wastewater Treatment Plant expansion, in Clay Township, IN.

Currently, there is an estimated backlog in the Region of 0.60 mgd. This represents the capacity that is needed for the Region to operate at 75% of permitted capacity during annual average daily demand. With this additional capacity, the total capacity in the Region would be 645.76 mgd. By 2010 there will be an excess of capacity in the Region of 29.95 mgd. But by 2020 that excess capacity will be gone, and an additional 38.57 mgd of capacity will be needed. By 2030, an additional 95.16 mgd of capacity will be needed in the Region in order to operate at 75% of total capacity during average annual daily demand. Table 7-11 shows the above information in greater detail.

Table 7-11: Region-wide Wastewater Capacity Needs, 2010-2030

	Capacity (mgd)	Peak Operating Rate	Total Capacity Needed to Operate at 75% during AADD (mgd)	Capacity needed (mgd)
Current Capacity	645.16	75.1%	645.76	0.60
2010 Capacity	739.12	72.0%	709.17	-29.95
2020 Capacity	739.12	82.0%	807.64	68.52
2030 Capacity	739.12	91.6%	902.80	163.68

Source: SFRPC

The first of the three projects used to determine cost estimates for the elimination of current backlog, as well as the future demand, is the report "Investing in Southeast Michigan's Quality of Life: Infrastructure Needs." The Southeast Michigan Council of Governments did this study in April 2001. The purpose of this study was to describe the need for continued and additional investment in Southeast Michigan's sewer infrastructure. The sewer needs between 2001 and 2030 were identified, as well as the estimated cost of meeting these needs. Cost estimates for providing the needed capacity were developed for three ranges, based on information provided by engineering consulting firms that design and construct wastewater treatment plants in Michigan. The high estimate is $13.1 million per million gallons of capacity added, the mid estimate is $9.2 million per million gallons, and the low estimate is $5.9 million per million gallons.

Based on the current backlog in the Region's wastewater treatment plants, 0.60 mgd, the cost to eliminate this, using SEMCOG's estimates, would range from $4 million at the low end to a high of $7.86 million. The mid-range estimate is $5.5 million.

By 2010, the demand in the Region for wastewater service will increase, but there is currently plans in place to provide enough additional capacity so that Region will be operating under 75% of total capacity during average annual daily demand. In fact, there will be a "surplus" of

capacity totaling 29.95 mgd. This means that no additional cost beyond what is anticipated by individual plants and municipalities will be needed, except for routine maintenance costs.
At this time, there are no planned wastewater treatment plant expansion plans beyond 2010 in the Region. This means that the total capacity, at this time, would remain the same, even though the demand will be increasing. A total of 38.57 mgd of capacity will need to be added to the Region's facilities between 2010 and 2020 in order for the Region as a whole to operate at 75% of total capacity during average annual daily demand. Using SEMCOG's cost amounts, the estimates range from a low of $227 million to a high of $505.06 million. The mid range estimate is $353.56 million.

By 2030, an additional 95.16 mgd of capacity will be needed in the Region. Using the cost amounts from the SEMCOG report, the low estimate is $560 million, the mid-range estimate is $872.3 million and the high estimate is $1.246 billion.

Overall, an additional 134.33 mgd of capacity will need to be added to the Region, starting with the 0.60 mgd of capacity that is needed just to address the current backlog. The total cost to do this, based on the cost amounts in the SEMCOG report, range from a low of $790 million to a high of $1.759 billion. The mid range estimate is $1.231 billion.

Table 7-12: Wastewater Cost Estimates 2010-2030, Based On SEMCOG Project Costs

Year	Additional Capacity needed to operate at 75% of AADD	Low Estimate (in millions)	Mid Estimate (in millions)	High Estimate (in millions)
Current Backlog	0.60 mgd	$4.0	$5.5	$7.86
By 2010	0 mgd	$0	$0	$0
Between 2010 and 2020	38.57 mgd	$227	$353.56	$505.08
Between 2020 and 2030	95.16 mgd	$560	$872.3	$1,246.14
TOTAL	**134.33 mgd**	**$790**	**$1,231**	**$1,759**

Source: SFRPC, Southeast Michigan Council of Governments (SEMCOG)

The second project used to determine cost estimates for the Region's wastewater needs was the expansion at the Empire Wastewater Treatment Plant in Dakota County, Minnesota. Currently the plant serves 100,000 residents, but its service area is expected to nearly double in population by 2030, prompting the need for expansion. The current capacity of the plant is 12 mgd; the expansion project will increase the capacity to 24 mgd. The final disinfection of the wastewater will be upgraded as well as an upgrade to the biological phosphorus removal process. The expected cost of the project is $71 million, which is approximately $5.9 million per million gallons of capacity added. A range of 30 percent above and below the cost was also calculated.

Using the cost amounts from the Empire WWTP, the cost estimate to eliminate the current backlog in the Region is $3.6 million. The low estimate, 30 percent below the cost, is $2.5 million and the high estimate is $4.6 million.

Because there is expected to be a "surplus" of capacity by 2010, there are no additional costs beyond what are currently being planned for the facilities in the Region. But by 2020, that surplus will be gone, and an additional 38.57 mgd of capacity will be needed in the Region in order to operate at 75% of capacity during average annual daily demand. The cost of the additional capacity would be $228.2 million using the Empire expansion project, with a low estimate of $159.7 million and a high estimate of $296.7 million.

The additional 95.16 mgd of capacity that will be needed by 2030 will cost an estimated $563 million based on the cost estimates for the expansion of the Empire WWTP. The low estimate is $394.1 million and the high estimate is $731.9 million.
Based on the cost estimates for the expansion project at the Empire WWTP, it will cost $794.8 million to add the additional 134.33 mgd of capacity that will be needed in the Region by 2030. The low estimate is $556.4 million and the high estimate is $1,033.2 million.

Table 7-13: Wastewater Cost Estimates 2010-2030, Based On The Empire WWTP Project Cost

Year	Additional Capacity needed to operate at 75% of AADD	Cost (in millions)	Low Estimate (in millions)	High Estimate (in millions)
Current Backlog	0.60 mgd	$3.6	$5.5	$7.86
By 2010	0 mgd	$0	$0	$0
Between 2010 and 2020	38.57 mgd	$227	$353.56	$505.08
Between 2020 and 2030	95.16 mgd	$560	$872.3	$1,246.14
TOTAL	**134.33 mgd**	**$790**	**$1,231**	**$1,759**

Source: SFRPC, Dakota County (MN)

The third project used to determine cost estimates for the Region's wastewater needs was the Michigan Road Wastewater Treatment Plant expansion project, in Clay Township, IN. The project will increase the capacity of the plant by 1.5 mgd, from 1.05 mgd to 2.55 mgd. It also involves a new headworks screening facility, a Vertical Loop Reactor (VLR) oxidation basin, new ultraviolet disinfection, and improvements to the existing wastewater treatment plant process. The total cost of the project is estimated to be $10 million. This is $6.67 million per million gallons of increased capacity. A range of 30 percent above and 30% below cost are also given.

Using the cost estimate from the Michigan Road expansion project, the cost to eliminate the current backlog in the Region is $4.0 million, with a low estimate of $2.8 million and a high estimate of $5.2 million.

Because of the expected "surplus" in capacity between now and 2010, there is no cost for that time period. By 2020, the "surplus" will be eliminated, and an additional 38.57 mgd of capacity will be needed. The cost for this, based on the Michigan Road project, is $257.3 million. The low estimate is $180.1 million and the high estimate is $334.4 million.

Using the same cost estimate, it would cost $634.7 million to add the 95.16 mgd of capacity that will need to be added in the Region between 2020 and 2030. The low estimate for this increase is $444.3 million and the high estimate is $825.1 million.

The total cost of providing the needed capacity in order to keep the Region's wastewater treatment plants operating at 75% of capacity during average annual daily demand is $895.9 million. The low estimate for the increase is $627.2 million and the high estimate is $1,164.8 million.

Table 7-14: Wastewater Cost Estimates 2010-2030, Based On The Michigan Road WWTP Project Costs

Year	Additional Capacity needed to operate at 75% of AADD	Cost (in millions)	Low Estimate (in millions)	High Estimate (in millions)
Current Backlog	0.60 mgd	$4.0	$2.8	$5.2
By 2010	0 mgd	$0	$0	$0
Between 2010 and 2020	38.57 mgd	$257.3	$180.1	$334.4
Between 2020 and 2030	95.16 mgd	$634.7	$444.3	$825.1
TOTAL	**134.33 mgd**	**$895.9**	**$627.2**	**$1,164.8**

Source: Clay Township (IN)

VIII. Task 8 – Financing Options

Several options exist as financing strategies to fund water and domestic wastewater facilities projects as provided for in the Florida Statutes. For a comprehensive list of statutory citations, please refer to Appendix E. The following section provides examples of commonly employed financing strategies that are available to local governments in order to provide the necessary infrastructure to sustain infill and promote redevelopment.

A. Funding For Water Facilities Projects

1. Drinking Water State Revolving Fund

The Florida Department of Environmental Protection (DEP) helps to fund water facilities through the Drinking Water State Revolving Fund (SRF) Program[25]. The SRF Program is the primary vehicle for funding drinking water facilities in the State. The Drinking Water SRF provides low-interest loans for planning, designing, and constructing public water facilities. Projects eligible for SRF loans include new construction and improvements of public water systems, including storage, transmission, treatment, disinfection, and distribution facilities.

Federal and State appropriations 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. DEP solicits project information each year, typically 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 Pre-construction Loans to rate-based public water systems, Construction Loans of $75,000 minimum or more, and Pre-construction 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. Small community assistance is available for communities having populations less than 10,000. Each year 15% of the funds is reserved exclusively for their use. In addition, small communities may qualify for loans from the unreserved 85% of the funds.

Cities, counties, authorities, special districts and other entities (representing privately owned, investor-owned, or cooperatively held public water systems) legally responsible for public water services are eligible for loans. Loan funding is based on a priority system, which takes into account public health considerations, compliance with the Federal Safe Drinking Water Act or other enforceable requirements relating to drinking water systems, and affordability. Affordability includes the evaluation of median household income, population affected, and consolidation of very small public water systems, which serve a population of 500 people or fewer. Only project sponsors owning community water systems or non-profit water systems are eligible to receive financial assistance. Projects for which the total cost is less than $75,000 are not eligible. A project sponsored by a for-profit private owner or investor-owner of a community water system that regularly serves 1,500 service connections or more within a single certified or franchised area is not eligible unless the project will result in the consolidation of two or more public water systems.

For the purposes of the SRF, community water system is a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. The systems include cities, towns, subdivisions, and mobile home communities.

[25] Source: Florida Department of Environmental Protection, http://www.dep.state.fl.us/

A non-profit non-community system is a water system that is owned by a non-profit Florida corporation qualifying for such status under Chapter 617, F.S., the Florida Not For Profit Corporation Act. The system must provide water to at least 15 service connections or serves at least 25 individuals at least 60 days out of the year. The systems typically are systems that serve Boy Scout and Girl Scout camps, church camps, homeless shelters, or halfway houses. A non-profit non-transient non-community system is a public water system that is not a community water system and that regularly serves at least 25 of the same persons over six (6) months per year. These systems include businesses, schools, and similar establishments that meet the requirements of the Chapter 617, F.S.

Pre-construction loans are available for rate-based public water systems that have a public health risk priority issue. A project sponsor must qualify as a small community unless the project priority is based, in part, on consolidation or rationalization. Pre-construction loans for the planning, engineering, and administrative allowances provide rate-based community water systems funds to complete the planning and engineering work necessary to proceed with project construction. Pre-construction loans are limited by a maximum project cost of $2 million.

Construction loans, available to almost all public water systems regardless of size, provide funding for construction after the planning and design activities are completed. Disbursements are made to the entity after costs are incurred, generally on a monthly basis. Construction loans must meet the following requirements:

1. Submit a construction plan that is cost-effective, environmentally and financially sound, and consistent with the local comprehensive plan.
2. Insure public participation in the planning process.
3. Establish how the loan will be repaid.
4. Have acquired the necessary project sites.
5. The construction design must be consistent with the planning recommendations.
6. Have obtained the necessary permit(s) to enable construction.
7. Complete a value engineering report for projects valued at more than $5,000,000.

Pre-construction grants are available to economically disadvantaged communities. A project sponsor must qualify as a financially disadvantaged community and must qualify as a small community. Grants are limited to rate based community water systems only. A project includes the planning, engineering, and administrative activities necessary to qualify for funding of a construction project. Pre-construction grants at 85% of allowances are provided, as long as the median household income in the community is less than the statewide average and the community has an associated public health risk component associated with the project. Pre-construction grants are limited by a maximum project cost of $2 million.

Construction grants are also available to project sponsors that qualify as financially disadvantaged communities. Grants are awarded only for projects for which a public health risk component is assigned. Projects must meet the user charge (or equivalent) financial burden, benefit limitation, and priority criteria as defined in the drinking water rule. Grant funding for qualifying project sponsors is limited to 65% or 85% of the estimated post-allowance costs for the public health component. Construction grants are limited to 25% of available funds or $750,000 in any single year, whichever is less. Projects qualifying for grants in excess of the amount available from DEP in a single fiscal year will be segmented for deferred funding in subsequent years. The minimum segmented grant amount available in any one year will be the lesser of the estimated adjusted post-allowance project costs or $375,000 subject to the 25% limitation referenced above. Grantees are required to meet the following requirements:

1. Submit a construction plan that is cost-effective, environmentally and financially sound, and consistent with the local comprehensive plan.
2. Insure public participation in the planning process.
3. Establish how the loan will be repaid.
4. Have acquired the necessary project sites.
5. The construction design must be consistent with the planning recommendations.
6. Have obtained the necessary permit(s) to enable construction.
7. Complete a value engineering report for projects valued at more than $5,000,000.

The repayment period for loans is typically for 20 years. However, loans to financially disadvantaged communities may be for 30 years. The interest rate is 60% of the market rate as established using the "Bond Buyer 20 - Bond General Obligation Bond Index". The rate is a fixed rate and repayment begins six months after project work is scheduled to be completed. Payback consists of equal semiannual repayments and the revenue source to be used to repay the loan must be identified. Standard loan agreements are set up for a pledge of water and sewer utility revenues. These are commonly used but other types of revenues can be considered. Generally, pledged revenues resulting from the operation of water systems or water and sewer systems shall be as follows:

1. Pledged revenue shall be not less than 1.15 times the amount required to make each semiannual loan repayment.
2. For project sponsors who have not demonstrated the ability to service long term debt, special loan security provisions shall be negotiated that provide assurance that debt service requirements will be fulfilled. These provisions include:

    a) Additional escrowed reserve funds (equivalent to not less than five semiannual loan repayments) and a lien on the assets of the project sponsor.
    b) A letter of credit from a bank or trust company and a lien on the assets of the project sponsor.
    c) A personal or corporate, as applicable, obligation ensuring that all semiannual repayments can be made.
    d) Other security features equivalent to those described above.

2. Water Supply Restoration Program

The Water Supply Restoration Program (WSRP)[26] was created in the mid-1980's to restore or replace drinking water wells contaminated with Ethylene Di-Bromide (EDB). Through agreement of a multi-agency task force, the Department of Agriculture and Consumer Services performed early restoration and replacement of EDB-contaminated wells. In 1990, these responsibilities were transferred to the Department of Environmental Protection. Specifically, Chapter 376.30(3)(c), F.S. directed the Department to "establish a program to provide for expeditious restoration or replacement of potable water systems or potable private wells of affected persons where health hazards exist due to contamination from pollutants." This includes a provision for bottled water on a temporary basis, after which a more stable and convenient source of potable water shall be provided through the use of filters or connection to public water systems. Funding for this program is provided by Water Quality Assurance Trust Fund (WQATF) and the Inland Protection Trust Fund (IPTF). The WQATF is used for restoration or replacement of potable water supplies contaminated with non-petroleum substances and the IPTF is used strictly for the restoration or replacement of potable water supplies contaminated with petroleum related substances.

To qualify for WQATF or IPTF funding, water-sampling results must show that the contaminants in the potable water supply exceed a Maximum Contaminant Level (MCL), or Health Advisory Level (HAL), or be determined by the Department of Health (DOH) to be a health hazard. Approximately $300,000 to $500,000 is spent annually on IPTF sites and $3,500,000 is spent annually on WQATF sites. Restoration/replacement work has been conducted in 45 counties throughout the State.

B. Funding For Domestic Wastewater Projects

The Florida Department of Environmental Protection (DEP) helps to fund domestic wastewater projects through the State Revolving Loan Fund (SRF), the State Financially Disadvantaged Small Community Grant, and the State Bond Loan programs. The SRF is administered by DEP through the Bureau of Water Facilities Funding. It makes low-interest loans available for construction, rehabilitation, and replacement of facilities needed to collect, treat, dispose of, or reuse municipal wastewater. It is a revolving fund because loan repayments are used to make additional loans. Over the past 10 years, domestic wastewater treatment facilities received over 0.9 billion dollars through the state revolving loan fund. Many domestic wastewater projects throughout the state received a significant portion of these monies. The State Financially Disadvantaged Small Community Grant program is administered by the DEP through the Bureau of Water Facilities Funding. It will make available 65 to 85 percent grants for wastewater improvements to communities with population of 7,500 or less in which the per capita income is below the state average per capita income. The first grants were offered about July 2000. The State Bond Loan program is jointly administered by the DEP and the Division of Bond Finance of the State Board of Administration. Cities, counties, districts, authorities, and other local agencies are eligible for receipt of this loan. This fund can be used for the construction of domestic wastewater facilities.

[26] Source: Florida Department of Environmental Protection, http://www.dep.state.fl.us/

1. Wastewater State Revolving Fund Loan Program

The Clean Water Act State Revolving Fund (SRF) Program, which provides low interest loans for water pollution control activities and facilities is the primary vehicle for funding wastewater facilities in the State. Water pollution control can be divided into point source (such as a permit for discharge in an urban area) and non-point source (such as stormwater runoff from agricultural operations). The Clean Water SRF Program is distinct from the Safe Drinking Water Act SRF that provides funding for drinking water activities and facilities. The Clean Water SRF Program began in 1989 and over a billion dollars in loans have been made by the Florida Department of Environmental Protection. The Program was expanded to make stormwater management eligible for funding. The Program revolves in perpetuity using state and federal appropriations, loan repayments, investment earnings, and bond proceeds. Projects eligible for SRF loans include wastewater management facilities, reclaimed wastewater reuse facilities, stormwater management facilities, widely accepted pollution control practices (sometimes called "best management practices") associated with agricultural stormwater runoff pollution control activities, and estuary protection activities and facilities.

The SRF Program provides low-interest loans for planning, designing, and constructing wastewater facilities. Federal and State appropriations 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. The information is used to establish project priorities for the following annual cycle. Funds are made available for Pre-construction Loans and Construction Loans. The Loan Terms include a 20-year amortization and low-interest rates. Pre-construction loans are available to all communities and provide up-front disbursements for administrative services, project planning and project design. Eligibility is established in the federal Clean Water Act. Local governments (municipalities, counties, authorities, special districts, and agencies thereof) are eligible for loans to control wastewater and stormwater pollution. Non-governmental parties (basically any entity that can repay a loan) are eligible for loans to control stormwater pollution related to agricultural operations.

The need for funds to address wastewater needs in Florida far exceeds the amount available under the SRF. The U.S. Environmental Protection Agency in its 1996 Clean Water Needs Survey provided estimates of funding need. The State of Florida's estimated sewer needs were $5.4 billion. From 1989 to 2000, DEP issued approximately $566 million in funds and the loan repayment stream in 1999 was $47 million. The Clean Watersheds Needs Survey and Report to Congress (CWNS), a joint effort of the States and the Environmental Protection Agency is conducted every four years. The CWNS compiles estimates of capital costs for projects that treat wastewater, stormwater, non-point source pollution and programs designed to protect estuaries. The 2004 CWNS is not yet released.

The SRF interest rate is a below-market rate. While the value of the subsidy varies with the individual borrower's credit rating, an example may serve to illustrate the SRF savings. A local government with a very good AA bond rating would pay 177% as much in total interest on a 5.5%, 20-year marketplace loan as it would on a 3.3%, 20-year SRF loan. For a one million dollar loan, that is an extra $287,000 in interest that would have to be paid to the bondholders to get marketplace financing. There are other less substantial financial advantages, such as a more advantageous SRF debt service reserve requirement. The savings available to communities that have less favorable bond ratings (or none at all) would be greater than for the example given. The SRF Interest Rate for January- March 2005 is 2.70%.

Pre-construction loans are available to all eligible applicants. The loan provides up-front disbursements for project planning, administrative services and project design. The loans also provide a mechanism for continued funding for project costs, including construction. Planning and design do not need to be complete to qualify. Applications are required to identify and develop a schedule for project planning, engineering, and administrative activities; establish how the loan funds disbursed for planning, design, and administrative services will be repaid; and develop a preliminary estimate for the project cost.

Construction loans, available to all local governments regardless of size, provide moneys for construction after planning and facility design activities are complete. Disbursements are made to local governments after costs are incurred during construction and generally on a monthly basis. Construction loans must meet the following requirements:

1. Construction plans must be cost-effective, environmentally and financially sound.
2. Facilities must be consistent with local comprehensive plans.
3. Provide for public participation in the planning process.
4. Establish how the loan will be repaid.
5. Have acquired the necessary project sites.
6. The design facilities must be consistent with the planning recommendations and identified needs.
7. Have obtained the necessary permit(s) to enable construction.

At the beginning of each fiscal year, small communities having populations less than 20,000 are entitled to priority use of 15% of all loan funds. In addition, small communities qualify for loans from the unreserved 85% funds. All projects are prioritized for funding according to a system that favors small projects regardless of who the project sponsor is.

Loans are to be repaid over the useful life of the project up to a maximum of 20 years. Loans to project sponsors qualifying as financially disadvantaged communities may obtain loans for 30 years. Pre-construction loans and loans for the costs associated with pollution control associated with agricultural runoff have shorter loan repayment periods, generally 10 years. The interest rate for loans is a fixed rate and is calculated at 60% of the market rate, as established using the "Bond Buyer 20 - Bond General Obligation Bond Index". Repayment typically begins six months after project work is scheduled to be completed and is consists of equal semiannual repayments. The revenue source to be used to repay the loan must be identified and standard loan agreements are set up for a pledge of water and sewer utility revenues. These are commonly used but other types of revenues can be considered. Generally, pledged revenues resulting from the operation of water systems or water and sewer systems are as follows:

1. Pledged revenue shall be not less than 1.15 times the amount required to make each semiannual loan repayment.
2. For project sponsors who have not demonstrated the ability to service long term debt, special loan security provisions shall be negotiated that provide assurance that debt service requirements will be fulfilled. The provisions can include:
    a) Additional escrowed reserve funds (equivalent to not less than five semiannual loan repayments) and a lien on the assets of the project sponsor.
    b) A letter of credit from a bank or trust company and a lien on the assets of the project sponsor.
    c) A personal or corporate, as applicable, obligation ensuring that all semiannual repayments can be made.
    d) Other security features equivalent to those described above.

2. Wastewater Grants Program

Wastewater grants for financially disadvantaged small communities are authorized by Chapter 62-505, F.A.C. , for the Financially Disadvantaged Small Community Program. It will make available 65 to 85 percent grants for wastewater improvements to communities of 7,500 population or less in which the per capita income is below the state average per capita income. Funding for these grants began in year 2000, with Florida City is the only South Florida Community on the priority list. However, because the requests for wastewater grants greatly exceeded the available funds, it is not anticipated grant funding for new projects to be available in the near future. The funding is expected to grow from $2.5 million for the year beginning July 1, 2000 to about $10 million per year by the end of 2010 using current projections. The program will fund planning, designing, and constructing collection, transportation, treatment, disposal (and reuse) wastewater facilities. Grants will not fund operation and maintenance costs. The top priority projects must address the elimination of a public health hazard. Projects that will achieve compliance with regulatory agency requirements are next in priority. The amount of wastewater causing the problem is a significant criteria to determine funding. The grants cannot be used to purchase existing facilities.

To be eligible to participate in the Financially Disadvantaged Small Community Program, the following criteria must be met:

1. Municipalities only are eligible (no counties or special districts).
2. Maximum 1990 population of 7,500.
3. 1990 per capita income less than $19,107.
4. A community cannot be a financially disadvantaged pocket within a municipality that does not meet all the criteria above.

C. Funding For Water And Domestic Wastewater Facilities Projects

1. State of Florida Bond Loan Program

The State Bond Loan Program is jointly administered by the Department of Environmental Protection and the Division of Bond Finance of the State Board of Administration. Any municipality, county, authority, or district, or sub agency of these entities, may obtain funding for projects. Water supply and distribution facilities, stormwater control and treatment projects, air and water pollution control, and solid waste disposal facilities are eligible. Up to $300 million in State of Florida, tax exempt, full faith and credit, Pollution Control Bonds may be issued annually at market rates. Applicants are served on a first come, first served basis. There are financial analysis, bond validation, and bond marketing activities that require in excess of six months to complete.

There is not an interest rate subsidy associated with these loans; the loans come from State of Florida full faith and credit revenue bonds. Bonds are sold on a competitive bid basis and reflect market conditions and are tax exempt. The advantage to getting a loan under this program is that using the State's credit rating, interest rates may be lower than what is available directly to a local government. The cost to issue the debt is low using the bond counsel and underwriting services available to the State. The pledged revenues usually are generated by the utility being improved by the project facilities. The program can provide $300 million per year. Loans less than $10 million probably would be packaged with other loans. Loans in the million-dollar range

may not be practical. Projects involving numerous small contracts, work orders, purchase orders, etc. are not practical under this program.

The Program dose not have planning, design, or permitting requirements, as required by the SRF Program. However, there are construction time constraints related to the tax-exempt status of the State's bonds. Basically, projects must be ready for bidding when the loan is requested. Loan proceeds are disbursed on a cost incurred basis, similar to the SRF program. The applicant provides the following information to the Department of Environmental Protection before bonds can be validated and sold by the State Board of Administration (Division of Bond Finance):

1. A resolution authorizing the application, loan amount, and pledge of revenues.
2. An ordinance(s) authorizing the rates, charges, and fees to be collected as pledged revenues.
3. A schedule for completing the project, loan disbursements, and loan repayments.
4. Legal opinions as to the availability of pledged revenues and the right to increase rates.
5. A description of the local economic situation and existing/anticipated debt affecting the availability of pledged revenues.
6. Audited financial statements and interlocal agreements, if applicable.
7. An engineering report describing the history and organization of the utility, service area, planning period, existing facilities, capital improvement program, project description, cost estimate, need for the project, number of customers, utility billing, and utility income and expenses.
8. Plans and specifications, permit status, and confirmation of consistency with the local comprehensive plan.

2. Local Government Bonds

In Florida, local governments may issue bonds, which are instruments of indebtedness, to finance the costs of public improvement projects, including water and wastewater projects. Generally, two types of bonds are utilized: general obligation bonds and revenue bonds. Typically, because of the constraints of general obligation bonds, revenue bonds are more commonly used to finance water and wastewater projects.

General obligation bonds are backed by the "full faith, credit and taxing authority" of a local government. The bonds are payable from the revenues from ad valorem taxes on real or tangible personal property. The bonds must be only be issued after a voter referendum approving the bonds. Other security may be provided to back the bonds, such as special taxes, or any other allowable revenue source as long as the ordinance that adopts the bonds specifies how the bonds will be repaid.

Revenue bonds, on the other hand, are repaid by the revenues generated by the enterprise, such as a water or wastewater system, for which the bonds are being generated. Revenue bonds are not backed by the "full faith, credit and taxing authority" of a local government. The revenue bonds may be for any capital expenditure that a local government deems is a public purpose, including the refunding of any bonded indebtedness that may be outstanding on an existing project that is to be improved because of a new project. However, if the revenues from the enterprise being funded are not adequate to fund expenses, the local government issuing the bonds must use general revenue funds (or any other allowable funding) to meet the revenue shortfall to avoid defaulting on the bonds. A default could negatively affect the local government's overall credit rating.

Allowable funding to back revenue bonds includes proceeds from certain non-ad valorem taxes and special assessments. A local government may pledge all or part of existing tax revenue sources other than ad valorem taxes to meet the debt service requirements of revenue bonds. Other tax sources that may be utilized include local sales taxes, public service taxes, and state revenue sharing funds. However, once these funds are pledged to back the revenue bonds, they are not available to be utilized for any other local government needs. Special assessments may be levied against the property receiving a direct benefit from the project being financed with a special assessment revenue bond. The proceeds from the assessment then can be used to back the revenue bonds.

3. Community Redevelopment Areas

The Community Redevelopment Act of 1969, (Chapter 163, Part III, ss.163.330-163.462, F.S.), allows counties and municipalities establish Community Redevelopment Areas (CRAs) to help fund needed improvements in a designated area that has been found to be experiencing economic and physical decline due to slum and blight conditions. CRAs allow the use of tax increment financing (TIF), which is a method of generating the funds needed for capital improvements, including improvements to the water and wastewater systems. The TIF funding is derived from the incremental tax revenue increase that would be generated by ad valorem taxes in the CRA from the time of the creation of the CRA until a set period of time, but in case shall be longer than 30 years. The funds are deposited into a separate trust fund account and may only be used for redevelopment activities in the CRA.

In order to implement a CRA, a Community Redevelopment Plan must be adopted and must specially identify the publicly funded capital projects to be undertaken. The Plan must also include the projected costs of the redevelopment, including the amount to be expended on publicly funded capital projects and any indebtedness of the community redevelopment agency, the county, or the municipality proposed to be incurred for such redevelopment if such indebtedness is to be repaid with TIF funding.

Once a redevelopment plan is adopted, the CRA may utilize the TIF funds. It is important to note that the tax increment created by a CRA does not result in a significant amount of money in its early stages. However, a CRA can issue revenue bonds against the anticipated future TIF funds. Please see the previous section on bonds for a discussion of revenue bonds.

4. Community Development Districts

An option for private developers to create and fund water and wastewater districts is provided for in Chapter 190, F.S., which creates “Community Development Districts” (CDD). CDDs are local units of special-purpose government that can be timely, efficient, effective, responsive, and provide an economic way to deliver community development services, thereby providing a solution to the state's planning, management, and financing needs for delivery of capital infrastructure in order to service projected growth without overburdening other governments and their taxpayers. CDDs are created and limited to the performance of the specialized functions authorized by Chapter 190, F.S. and their creating ordinance. Other requirements for CDDs include that the boundaries for the CDD must be contained wholly within a single county; CDDs must create a governing body created, organized, and constituted and authorized to function specifically for the delivery of urban community development services; and provide for the formation, powers, governing body, operation, duration, accountability, requirements for disclosure, and termination of which are as required by general law.

The establishment of an independent CDD as provided for in Chapter 190, F.S., is not a development order within the meaning of chapter 380, F.S. All governmental planning, environmental, and land development laws, regulations, and ordinances apply to all development of the land within a CDD. CDDs do not have the power of a local government to adopt a comprehensive plan, building code, or land development code, as those terms are defined in Chapter 163, Part II, F.S., the Local Government Comprehensive Planning and Land Development Regulation Act. In addition, a CDD must be consistent with the applicable comprehensive plan, ordinances, or regulations of the applicable local general-purpose government.

The developers of a CDD typically issue revenue bonds to fund the needed capital improvements. The revenue bonds are then repaid by the revenues generated by the enterprise, in the same manner as revenue bonds issued by a local government. Security for the CDDs is an agreement from the applicable local government that all or a portion of the net benefit that the local government receives from the development in the CDD area is returned to the CDD. The net benefit is defined as new tax revenues minus new expenditure requirements. The resulting revenues can be used by the CDD to defray infrastructure costs or to buy down the amount of funding needed to provide for the infrastructure.

5. Other Local Government Initiated Programs

A local government may adopt a fee to be paid by new users of wastewater and water services within their service area. The fee is typically set by type of use and the proposed impact. The fee is the estimated pro rata share of the cost of the facilities that will serve the new development. The need for the new facilities is based in whole or in part for the need of new facilities. The impact fees collected must be kept separate from other revenues and must be used exclusively to acquire, purchase, or construct new facilities. The local government must maintain adequate records to ensure that impact fees are expended only for permissible new facilities or equipment.

A local government may levy an “Infrastructure Surtax,” with voter approval. The Surtax is limited in rate to either ½ % or 1% of the purchase price of an item subject to the state sales tax. The proceeds must be used to finance, plan, or construct infrastructure, and can be pledged to pay general obligation or revenue bonds.

A municipality may levy a tax on the purchase of water service. The tax can only be levied in the municipality and cannot exceed 10% of the payments received. The proceeds of the tax can be used for any municipal purpose, including water and wastewater services.

6. Community Development Block Grant Program

The Community Development Block Grant (CDBG) Program, administered by the U.S. Department of Housing And Development, provides eligible metropolitan cities and urban counties (called "entitlement communities") with annual direct grants that they can use to revitalize neighborhoods, expand affordable housing and economic opportunities, and/or improve community facilities and services, principally to benefit low- and moderate-income persons. Water and wastewater facilities improvements are eligible for funding.

Since 1974, the CDBG Program has been the backbone of improvement efforts in many communities, providing a flexible source of annual grant funds for local governments

nationwide—funds that they, with the participation of local citizens, can devote to the activities that best serve their own particular development priorities, provided that these projects meet one of the following priorities:

1. Benefit low- and moderate-income persons;
2. Prevent or eliminate slums or blight; or
3. Meet other urgent community development needs.

The CDBG Entitlement Communities program provides this Federal assistance to almost 1000 of the largest localities in the country. As one of the Nation's largest Federal grant programs, the impact of CDBG-funded projects can be seen in the housing stock, the business environment, the streets and the public facilities of these entitlement communities. Each year, the grant funds available for entitlement communities are allocated according to relative need on the basis of the higher of two formulas. The first considers the presence of overcrowded housing in the locality, its population, and poverty rate. The second uses housing age, population growth lag, and poverty rate.

Recipients of CDBG entitlement funds include local governments with 50,000 or more residents, other local governments designated as central cities of metropolitan areas, and urban counties with populations of at least 200,000 (excluding the population of entitled cities). Local governments may carry out all activities themselves or award some or all of the funds to private or public nonprofit organizations as well as for-profit entities. A separate component of CDBG—the Small Cities CDBG Program**,** provides program funds to the States, which they allocate among localities that do not qualify as entitlement communities.

Low- and moderate-income persons (generally defined as members of a family earning no more than 80 percent of the area median income) benefit most directly and most often from CDBG-funded activities. Grantees must use at least 70 percent of CDBG funds for activities that principally benefit low- and moderate-income persons. This includes activities where either the majority of direct beneficiaries (from the jobs created, for example, or the housing units rehabilitated) are low- or moderate-income persons and activities that serve an area generally (a new community center, for example, or water or wastewater line installation or improvements) where the majority of the residents of that service area are low- and moderate-income persons.

Grantees may use CDBG funds for activities that include (but are not limited to):

1. Acquiring real property (primarily land, buildings, and other permanent improvements to the property) for public purposes.
2. Reconstructing or rehabilitating housing and other property.
3. Building public facilities and improvements, such as streets, sidewalks, sewers, water systems, community and senior citizen centers and recreational facilities.
4. Helping people prepare for and obtain employment through education and job training, welfare-to-work activities, and other services.
5. Assisting for-profit businesses for special economic development activities.
6. Providing public services for youths, seniors, or the disabled. These might include day care centers, youth services and meals on wheels for the elderly, health care facilities, transportation, or counseling.
7. Carrying out crime reduction initiatives.
8. Assisting low-income homebuyers.
9. Enforcing local building codes to reverse housing deterioration and other signs of blight.

To receive its annual CDBG entitlement grant, a recipient must have an approved Consolidated Plan, which fulfills the application and reporting requirements for entitlement communities and contains an action plan describing how the jurisdiction will use its CDBG funds. If any of the CDBG funding is to be utilized for water or wastewater projects, the projects must be included in the Consolidated Plan.

7. EDA Public Works And Economic Development Program

The U.S. Department of Commerce, Economic Development Administration's (EDA) Public Works and Economic Development Program assists distressed communities in economic decline to revitalize, expand, and upgrade their physical infrastructure to attract new industry, encourage business expansion, diversify local economies, and generate or retain long term, private sector jobs and investment. The physical infrastructure includes water and wastewater systems. Typically, the funded projects upgrade or expand an area's existing economic infrastructure to support the new or expanding industry or commerce. Whenever possible, the program attempts to redevelop existing facilities and industrial/commercial locations. Redevelopment projects are encouraged because they promote sustainable economic development by taking advantage of readily available infrastructure and markets.

Eligible applicants include economic development districts; states, cities or other political subdivisions of a state or a consortium of political subdivisions; Indian tribes or a consortium of Indian Tribes, an institution of higher learning or a consortium of such institutions; or a public or private nonprofit organization or association acting in cooperation with officials of a political subdivision of a State. EDA projects are evaluated competitively and must meet both general criteria applicable to all programs as well as special criteria that may vary by program. Projects must be located in an area exhibiting economic distress at the time of application. Projects located outside these areas may be considered if they directly benefit a distressed area. All Public Works projects must be consistent with an EDA-approved Comprehensive Economic Development Strategy (CEDS). EDA usually funds 50% of project cost, however certain conditions of high economic distress or an applicant's inability to provide the matching share may permit a higher grant rate.

D. Regional Approaches To Water And Wastewater Facilities

In Florida, the responsibilities for water and wastewater are divided. Pursuant to the Florida Water Resources Act (Chapter 373, F.S.), the responsibility for water resource planning and water resource development has been delegated to the five water management districts in the State. While the Florida Legislature has not required local governments to provide water and wastewater facilities, enabling legislation has been passed to allow the provision of water and wastewater facilities and services and how to finance the facilities. In some cases, the Legislature has adopted statutes that encourage regional and multi-county systems.

Chapter 153, F.S., Water and Sewer Systems, addresses how county governments may provide for facilities and services. Part I, County Water System and Sanitary Sewer Financing (ss. 153.01-153.20, F.S.) addresses how water and wastewater systems may be financed. The section also provides for how one or more county may join together to form regional systems and how they may be financed. Part II, County Water and Sewer Districts (ss.153.50-153.88, F.S.) addresses how a county may establish water and wastewater systems in unincorporated areas and within incorporated areas of the county. Part III, Wastewater Facility Privatization Contracts, provides for how a county may privatize their water and wastewater facilities.

Chapter 166, F.S., Municipalities, addresses the responsibilities of a municipality in Florida and how to carry out those responsibilities. The responsibilities include the provision of water and wastewater facilities and services. The Chapter has four parts, each of which can impact how a water and wastewater facilities are provided for and funded. The parts of the Chapter are:

1. Part One, General Provisions (ss.166.011-166.0497, F.S.)
2. Part Two, Municipal Borrowing (ss. 166.201-166.251)
3. Part Three, Municipal Finance and Taxation (ss.166.201-166.251, F.S.)
4. Part Four, Eminent Domain (ss.166.401-166.411, F.S.)

E. Recommendation For A Regional Strategy

An overview of traditional funding strategies for capital improvement development available to local governments, as well as a list of enabling legislation for capital improvement financing, has been provided. In terms of a true regional funding strategy for capital improvements, a special funding mechanism must be crafted. A special regional district provides an example of a possible regional funding strategy for capital improvement development.

Creation of a Special Regional District

To maintain balanced infrastructure service distribution across the South Florida region, a multi-jurisdictional special regional district (SRD) could be established. The district would be allowed to levy special assessments, to issue bonds and exercise eminent domain. Since SRDs are empowered to carry out their specific functions, the incorporated SRD could use its powers to engage in a series of activities to procure funding.

The SRD could generate revenue through tax-increment financing and pursue federal, state, and foundation grants. These funds could be applied towards infrastructure development, public improvement and community needs. To justify the funding strategies and to assess existing and future need, the SRD would serve as a centralized clearinghouse by inventorying and monitoring the entire district's infrastructure performance. With this information, the SRD could focus energy and resources in strategic areas with the greatest need. In this manner, the regional approach may lead to a more efficient use of resources. Where appropriate in the Region, local governments could collaborate to develop a proposed through legislation for the creation of an SRD.

This section identifies a number of useful funding strategies, which based on local needs, could be utilized by local governments. Additional information can be found in Appendix E and in the *Local Government Financial Information Handbook*, 2004 Edition, prepared by the Legislative Committee on Intergovernmental Relations, May 2005.

Appendix A

Task 1 - Initial Findings

South Florida
Water, Wastewater, and Stormwater Facilities Study

Task 1 – Initial Findings

SFWMD Project #C-15798

Prepared by the
South Florida Regional Planning Council
September, 2003

Overview of Task 1

The South Florida Water, Wastewater, and Stormwater Facilities Study is divided into eight tasks. It is the purpose of Task 1 to conduct an inventory of existing wastewater, potable water and drainage facilities within the South Florida Region. The inventory serves two purposes. One, to demonstrate the degree to which inventories of existing public facilities reported in local government comprehensive plans are complete or consistent, and two, to establish a baseline population projection to the year 2050 needed to proceed with the next step in this study.

The initial findings in this portion of Task 1 are eye opening. As initially assumed, that no complete inventory of wastewater, potable water and drainage facilities is currently available for the region from any one source, or rather, there are no consistent or standardized reporting practices. An initial map series and database for water, wastewater and drainage facilities have been compiled and are included in Appendix A of this report. It is anticipated that this map series and database will be amended over time as this study progresses.

Currently, there are databases complied by various state and local agencies. The information included in these databases is generally relied upon to support in growth management and capital investment decisions within the region and state. Unfortunately, depending upon the database cited, the results can vary. It is not the intent of this study to point fingers, but rather to provide a complete and accurate picture of the public facilities currently available, and necessary to sustain the needs of the region. With over 1.2 million new residents anticipated over the next 20 years there a significant amount of capacity would need to be gained in order to accommodate the projected growth and maintain the environmental efficiency of the existing systems.

As revealed in the latest proposed comprehensive plan to be submitted for agency review, in July 2003, the City of Marathon Wastewater Element cited two different totals for the number of wastewater treatment facilities reported within the jurisdiction. Without an accurate inventory of all facilities within the region, it is impossible to determine just how many facilities there actually are within the jurisdiction, the operating capacity, or levels of treatment. Depending on whom you ask for verification, you may or may not receiving complete information.

In particular, information related to drainage within existing comprehensive plans varies from plan to plan. The information included within existing comprehensive plans is not sufficient for this study. Chapter 163 and Rule 9J-5 establish broad requirements for comprehensive plans; however, each local government has interpreted these requirements separately and there is not always consistent detail or sources of information, even for shared facilities.

For example, in September 2003, Council received a request from the District to review a stormwater permit application for a hotel, restaurant and gas station development project located on 13.5 acres in south Miami-Dade County. The project is located outside of the County's Urban Development Boundary but it could not be adequately determined with existing data whether or not the site is served with central services. Extensions of the sewer and water systems outside of the Urban Development Boundary are generally inconsistent with the goals and policies of the *Strategic Regional Policy Plan for South Florida*. Decisions to issue development permits in the region must be based upon the best available data.

As documented in this report, there are many gaps and questions in the various infrastructure databases that warrant further study and refinement. Upon completion of the study, the benefits of this study may pay dividends many times over if the needs of the region can be addressed and functionally coordinated through the local government comprehensive planning process.

As indicated above, without the ability to provide local governments with a consistent regional database of public facilities and available capacities, poorer decisions related to growth management and capital investment decisions within the region can result. With the anticipation of a new round of Evaluation and Appraisal Reports (EAR's), there is an opportunity to provide local governments with a reliable and consistent source of information that can be utilized to make better decisions.

On August 19, 2003 the Council entered into an agreement with the Department of Community Affairs to delegate EAR sufficient review authorization to the Council. The Council is therefore in a unique position to provide local government technical assistance and promote intergovernmental coordination. The results of this report can be immediately integrated into the update of the *Strategic Regional Policy Plan for South Florida* to be adopted by the Council in 2004, and utilized within the scope of the *State Road 7/U.S. 441 Collaborative Strategic Master Plan*. The study will also be useful when reviewing local government comprehensive plan Future Land Use Plan amendments and Applications for Development Approvals (ADA's) for Developments of Regional Impact.

Council Staff currently participates in the regular meetings of the Miami-Dade and Broward County Planners Technical Advisory Committees. The findings of this study will be shared with local practitioners to be considered while updating each of the region's 72 local government Comprehensive Plans. The inventory to be created as a part of Task 1 will essentially become the first region-wide EAR of the Wastewater, Potable, and Drainage Comprehensive Plan Elements that could be annually updated and monitored for continued applicability. Other applicability could be found when reviewing local government Water Supply Plans.

Data from the District, Department of Environmental Protection (DEP), and existing data contained within Future Land Use, Potable Water, Waste Water, Drainage, and Capital Facilities Elements of the Broward, Miami-Dade and Monroe County Comprehensive Plans and Evaluation and Appraisal reports was used to compile the initial inventory for Task 1. Data from comprehensive plans in the region were reviewed to evaluate the consistency between County plans and municipalities, such as, the City of Key West; City of Marathon; City of Miami Beach; City of Homestead; Florida City; City of North Miami; City of North Miami Beach; City of Sunrise; City of Pompano Beach; and the following cities along the State Road 7 corridor in Broward County: City of Hollywood; City of Plantation; City of Lauderdale Lakes; and the City of Margate.

The data included within these comprehensive plans is historic to some degree because the Comprehensive Plans for Miami-Dade and Broward were first adopted in 1988-1989 and there has only been one EAR cycle since their initial adoption. However, the historic nature of the data reflects the level and accuracy of information routinely provided to review agencies, including the District, Council, and Department of Community Affairs (DCA) when reviewing local government comprehensive plans. These plans, when adopted, will serve as the base from which local land development decisions and capital investments will be made for at least a 10 to 20 year time horizon. When this study is completed, it will be the first time that data reported from these local governments within the region have been effectively combined to create an image of the existing facilities.

The District recently conducted a survey of utility providers in the region for use in the Lower East Coast Waster Supply Plan and Comprehensive Everglades Restoration Plan. The information from this survey will be incorporated into Task 1 when it becomes available from the District and incorporated with the Task 2 deliverable that will identify the service areas for all facilities.

Task 1A

Identification of Water, Wastewater and Stormwater Facilities Reported in Adopted Local Government Comprehensive Plans, EAR Reports, and other Public Information Sources.

For public agencies, such as the Council, the adopted local government comprehensive plan is a critical source of information in which to base decisions related to growth management. Each local is required to adopt a comprehensive plan that is to be based upon best available information. Among other elements, the plan must contain a Water, Wastewater and Stormwater Element. The comprehensive plan must also provide for a 10 to 20 year planning horizon. The following analysis is a summary of the data reported by local governments in their adopted comprehensive plans.

Miami-Dade County

Miami-Dade County Water Treatment

In the 2003 EAR, Miami-Dade County is reporting a system wide water treatment capacity of 454.77 mgd and a peak water demand of 391.3 mgd. To meet County Level of Service Standard of operation, the rated capacity must be at least 2% above the maximum daily demand, which for Miami-Dade County would be at least 399.13 mgd (Table 1). Reported capacities in the 1989 comprehensive plan are included in Table 2.

In the 2002, the Miami-Dade Water and Sewer Department (WASD) reported that it pumped 121.3 billion gallons of water from its three water treatment plants and sold more than 96.1 billion gallons to its fifteen wholesale purchasers.

The Miami-Dade WASD also provides service to 387,000 retail customers and fifteen wholesale customers from its three water treatment facilities, five auxiliary treatment facilities that serve the southernmost area of the County, although the 2003 EAR reports six auxiliary treatment facilities.

The Miami-Dade WASD reports that it is designing a new 25 mgd water treatment plant to use a membrane treatment process that will replace the five smaller auxiliary facilities. The new water treatment plant will have an expansion capacity to 60 mgd and is anticipated to be complete in 2006. The Biscayne Aquifer is the primary source for raw water supply from the County's six major wellfields.

In projections for future capacity and demand to the year 2020, the County has identified a re-rating of the Hialeah/Preston system by 10 mgd and a re-rate of the Alexander Orr system by 30.26 mgd by the year 2005. Additional improvements include a new South Dade membrane softening Water Treatment Plant rated at 25 mgd by 2010. A new membrane softening Water Treatment Plant in the Northwest Wellfield area rated at 13 mgd and another re-rating of the Alexander Orr system by 30 mgd by the year 2015 for a new combined maximum daily capacity of 563.03 mgd in 2020 (Table 3).

Between the years of 1973 and 1985, WASD acquired the following utility systems for incorporation in the regional system.

1973	Westwood Lake Inc.
1974	South Miami Heights Public Utilities Corp.
	Holland Gardens Co.
	Southland Utilities
1975	Lake Shaw Water Co.
	City of Sweetwater
	Rex Utilities: Perrine System
1976	Miami Lakes Utilities
	Perrine Industrial Park (Florida Water & Utilities, Inc.
	City Water Co.
	National Water & Utilities Co.
1977	Utility Co. of Sweetwater, Inc.
	Carol City Utilities, Inc.
1978	Miami Utilities, Inc.
	Florida Water & Utilities, Inc.
1979	General Waterworks of South Florida, Inc.
	Golden Isles Utilities, Inc
1980	Sunshine Utilities Co.
	North Miami Shores Water Co.
1995	Rex Utilities, Inc.
1996	Southern Gulf Utilities, Inc.
1997	Dade Utilities, Inc.
1998	Broward Water Service
	N. Miami Beach Utilities Co.

As of 1988 there were no private water or sewer utility companies operating in Miami-Dade County. The Miami-Dade WASD provided about 90 percent of the water supply and sewer treatment. However, nineteen municipalities operated water distribution systems and eighteen municipalities operated sewage collection systems. Service is either distributed, or franchised, to either WASD or one of the municipal systems. Table 4 identifies wholesale users and water demand.

Table 1
Capacity of County and Municipal Water Treatment Plants
Miami-Dade County
2002

Facility	Rated Capacity (mgd)	Avg. Day Production (mgd)	Max. Day Production (mgd)	Available Capacity (mgd)
Hialeah/Preston	225.000	160.6	189.9	35.1
Alexander Orr	217.74	169.44	197.5	20.24
South Dade	12.03	6.7	8.8	3.25
(6 Plants – Former Rex)				
	454.77	336.74	396.2	58.57

Source: Miami-Dade County

The Miami-Dade WASD recognizes that County has implemented a number of initiatives to promote infill development and community revitalization, including Infill Housing Initiatives; Brownfields Program; Office of Community and Economic Development Program; Federal Empowerment Zone and Enterprise Zones; and the Quality Neighborhood Improvements Program. These initiatives have the potential to increase water and sewer services and that infrastructure improvements, including new additions and rehabilitation of existing deficiencies in the system will be necessary.

To prepare the expected increase in demand for its services, WASD completed a water/wastewater needs assessment study. The assessment study recommends 589 improvement projects over a 20-year period with costs over $1.1 billion. The results of the WASD assessment will be considered in future work Tasks of this study.

Table 2
Water Demand Projections for Regional Water Treatment Plants
Miami-Dade County
1987

	Hialeah/Preston		Alexander Orr	
	Avg. Day (mgd)	Max. Day (mgd)	Avg. Day (mgd)	Max. Day (mdg)
1990	170.0	204.0	257.0	288.4
1995	178.9	214.7	186.8	224.2
2000	210.6	252.8	217.6	268.9
2010	219.1	263.0	228.4	292.1

Source: Miami-Dade County

Table 3
WASD Water System
Capacity and Demand Comparison
Miami-Dade County
1995-2020

Year	Maximum Day Capacity (mgd)
1995	427.60
2000	454.77
2005	495.03
2010	520.03
2015	563.03
2020	563.03

Source: Miami-Dade County

Table 4
Total Potable Water Sales in Miami-Dade County
Wholesale and Retail Users
In Millions of Gallons (mgd)
Ten-Year Period
1993-2002

Water Sold Wholesale	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Hialeah	8,742	8,384	8,950	8,931	8,989	9,124	9,734	9,997	10,205	10,620
Miami Beach	7,456	7,853	8,714	8,102	7,901	8,404	8,612	8,923	9,177	9,103
N. Miami Beach	4,411	4,350	5,368	5,232	5,232	4,970	5,230	5,444	5,310	5,646
North Miami	1,612	1,862	1,917	2,096	1,890	2,117	2,510	2,405	2,265	2,128
Opa-Locka	1,001	1,030	1,206	1,214	1,253	1,276	1,359	1,377	1,447	1,397
Miami Springs	918	852	918	953	882	863	943	981	1,129	1,138
Hialeah Gardens	687	741	669	590	690	614	146	NA	NA	NA
Bal Harbor	542	522	596	592	550	555	545	511	540	532
North Bay Village	452	450	471	480	475	477	474	480	496	498
Medley	434	441	528	630	430	399	492	472	467	463
Bay Harbor Islands	405	351	382	375	382	371	382	386	367	354
Surfside	336	328	341	342	348	353	358	350	346	372
West Miami	292	280	285	267	243	327	343	318	296	302
Indian Creek	138	131	156	158	165	151	156	136	156	175
Virginia Gardens	8	10	11	55	105	101	113	105	NA	NA
Total wholesale	27,434	27,585	30,512	30,017	29,535	30,102	31,397	31,885	32,201	32,728
Retail	68,679	64,383	68,541	67,454	66,560	66,935	67,514	67,656	68,872	69,169
Total water sold	96,113	91,968	99,053	97,471	96,095	97,037	98,911	99,541	101,073	101,897
Total Customers	398,073	388,169	372,973	369,924	364,957	359,559	353,526	345,249	339,251	328,829

Source: Miami-Dade Water and Sewer Department

Miami-Dade Wastewater Treatment

The County's Regional Wastewater Treatment system is divided into three districts, North, Central and South.

The North District Wastewater Treatment Plant located at 2575 NE 151 Street, North Miami, and was built in 1970 to treat all sewage collected in northern Miami-Dade County. The plant was originally constructed with a capacity of 60 mgd but was increased to 80 mgd in 1981. Effluent is disposed to a deep-ocean outfall 2.5 miles offshore.

The Central District is also known as the Virginia Key Plant, and has been in operation since 1956. The plant was two facilities with a combined capacity of 121 mgd in 1988. The original plant built in 1956 with 48 mgd with the second plant being built in 1975 with a capacity of 73 mgd. Effluent was disposed of through an ocean outfall extending 18,800 feet into the Atlantic Ocean.

The South District Wastewater Treatment Plant, located at 8950 SW 232nd Street, and was operational in 1983 with a capacity of 75 mgd. Effluent is discharged into nine deep injection wells.

The Miami-Dade WASD reports that it serves approximately 306,000 retail customers and thirteen wholesale customers from its three-wastewater treatment plants. The wastewater transmission system also contains approximately 945 wastewater pump stations. Historic flows and treatment for each system is identified in Tables 5 and 6.

Table 5
Wastewater Plant Flows in Miami-Dade County
In Millions of Gallons (mgd)
Ten-Year Period
1993-2002

Facility	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
North District	35,970	36,463	34,988	36,468	35,042	37,594	35,679	35,693	32,549	31,856
Central District	44,581	44,061	44,858	44,017	46,766	45,741	47,403	51,038	48,106	49,634
South District	35,149	33,479	32,398	33,041	29,817	34,536	33,346	32,598	33,808	34,311
Total Plant Flow	115,700	114,003	112,244	113,526	111,625	117,871	116,428	119,329	114,463	115,801

Source: Miami-Dade Water and Sewer Department

Table 6
Total Wastewater Treatment in Miami-Dade County
In Millions of Gallons (mgd)
Ten-Year Period
1993-2002

Wastewater Treated Wholesale	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
Hialeah	10,328	10,825	11,074	11,430	13,438	15,988	13,906	13,954	11,562	11,970
Miami Beach	9,301	8,942	9,361	9,675	9,196	10,076	9,697	10,465	9,845	10,245
North Miami	4,116	4,032	4,071	4,057	3,608	4,184	3,521	4,007	4,019	4,293
Opa-Locka	1,101	2,287	1,135	1,204	1,267	1,382	829	1,063	1,258	1,193
Coral Gables	2,537	2,031	1,844	2,370	1,991	1,969	1,605	1,716	1,880	2,291
Miami Springs	1,205	1,477	1,328	1,030	1,480	1,799	1,396	1,431	892	733
N. Miami Beach	1,125	1,141	1,208	1,171	1,194	1,350	1,475	1,581	1,665	1,593
Medley	628	469	514	536	469	418	541	529	450	414
Florida City	367	317	255	216	173	115	113	112	145	159
Homestead ARB*	197	280	241	188	-	-	382	539	717	799
West Miami	188	198	187	189	194	188	165	146	92	106
Hialeah Gardens	197	94	137	166	147	154	123	79	118	111
Homestead	97	5	1	237	440	600	689	842	1,112	1,316
Dade Aviation**	-	-	-	-	-	-	-	-	-	939
Total wholesale	31,387	32,098	31,356	32,469	33,597	38,223	34,442	36,464	33,755	36,162
Retail	50,619	45,862	47,862	50,445	51,440	51,071	51,209	51,155	52,329	50,590
Unaccounted	33,694	36,043	33,026	30,612	26,588	28,577	30,777	31,710	28,379	29,049
Total water treated	115,700	114,003	112,244	113,526	111,625	117,871	116,428	119,329	114,463	115,801
Total Customers	306,061	294,000	283,656	280,594	273,576	270,639	263,649	255,724	250,007	241,308
Total Rainfall (in.)***	73.1	79.7	54.4	59.0	66.7	71.7	59.2	89.4	70.0	66.8

* Classified as retail customer in years 1996 through 1999
** Classified as retail customer as of 1994
***Recorded at Miami International Airport
Source: Miami-Dade Water and Sewer Department

The County's data and analysis for the Sanitary Sewer Element in the 1988 Comprehensive plan identifies the City of Homestead and Florida City with municipal wastewater plants and 33 minor treatment plants serving private development. However, Table 7 identifies 37 active plants. Additionally, the data and analysis also reports the City of Homestead Wastewater Treatment Plant to be approaching peak flow capacities and that the Florida Department of Environmental Protection is considering to reduce the plant's rating to 2 mgd In the Sanitary Sewer Element of 1988 Comprehensive Development Master Plan, the County utilizes a per capita flow of 100 gallons per day to estimate total flow needed to accommodate the 2,183,267 residents projected for the year 2005. The County has divided the service area into 31 collection zones.

Table 7
Wastewater Treatment Plants in
Miami-Dade County
1988

Facility	Design Flow	Average Flow as % of Design Flow	Effluent Disposal
Miami-Dade Regional Plants			
North District, 2575 NE 151 St.	80.0	94.4	Ocean Outfall
Central District, Virginia Key	121.0	102.0	Ocean Outfall
(Capacity Re-rating pending)	(133.0)	(92.7)	
South District, 8950 SW 232 St.	75.0	82.0	Deep Well Injection
Municipal Plants			
Florida City, 500 NW 5 St.	0.7	66.2	Soakage Pit
Homestead, 551 SE 8 St.	2.25	63.9	Ponds & Trenches
Minor Treatment Plants			
American Village MHP, 19800 SW 180 Ave.	.200	26.5	Soakage Pit
Athena Apts., 6775 SW 44 St.	.015	28.3	Soakage Pit
Atomic Sewage Plant, 6900 NW 58th St.	.030	57.8	FEC Canal
August Minor Apts., 8951 NE 8 Ave.	.016	70.3	Soakage Pit
Beefsteak Charlie, 13190 S. Dixie Hwy.	.011	36.4	Drainfield
Boystown of Fla., 11400 SW 137 Ave.	.350	6.1	Drainfield
Casa Grande Apts., 8701 SW 141 St.	.020	58.8	Soakage Pit
Chekika State Park, SW 237 Ave/168 St	.025	40.8	Drainfield
Cricket Club Condo, NE 114 St./Bisc. Blvd.	.015	63.5	Soakage Pit
El Escorial Townhouses, SW 69 Ct/42 Ter.	.030	50.0	Soakage Pit
Glades Office Bldg., SW 354 St/179 Ave.	.010	22.5	Soakage Trench
Hamilton Group Bldg., 6850 Coral Way	.005	20.0	Soakage Trench
Helman Court Apts., 15401 Biscayne Dr.	Deactivated 10/2/87		
Howard Johnson's, 7330 NW 36 St.	.040	74.4	Soakage Pit
Inscho Warehouse, NW 62 St/78 Ave	.015	43.3	Soakage Pit
KOA of N. Miami Bch., 14075 Biscayne Blvd.	.015	42.2	Soakage Pit
KOA, 20675 SW 167 Ave.	.050	55.5	Soakage Pit
U.S. Immigration Ctr., Krome Ave/SW 12 St.	.120	37.0	Open Drain
Lakeview Garden Apts., 7711 Miller Dr .	.030	37.9	Drainfield
Ludlam Plaza Apts., 1247 SW 67 Ave.	.012	72.9	Drainfield
Miami Shores Condo, 9020 NE 8 Ave.	.040	22.2	Soakage Pit
Miller Lakes Apts., 5500 SW 77 Ct.	.040	98.4	Soakage Pit
Northgate Townhouse, 1701 NE 115 St.	.050	59.3	Soakage Pit
Pine Lake MHP, SW 165 St/SW 137 Ave.	.200	88.6	Soakage Pit
Pantry Pride, NW 103 St/7 Ave.	.015	53.3	Drainfield
Quail Roost MHP, 17101 SW 200 St.	.186	63.4	Drainfield
Redlands MHP, 17360 Silver Palms Dr.	.015	72.5	Soakage Pit
Scottish Inn, 1223 NW 1 Ave, Fla. City	.004	60.0	Soakage Pit
79 St. Farmers Market, 3070 NW 79 St.	.040	21.0	Soakage Pit
The Shores Villas, 8901 NE 4 Rd.	.040	40.6	Soakage Pit
S. Miami High School, 6856 SW 53 St.	.075	5.3	Soakage Pit
South Shores Shop Ctr., SW 136 St/US 1	.040	30.9	Soakage Pit
Spanish Court Apts, 3995 SW Ave.	.010	70.0	Soakage Pit
Spring Tree Apts, 3845 SW 103 Ave.	.020	90.0	Soakage Pit
Sunrise Point Condo, SW 128 St/82 Ave .	.040	30.7	Soakage Pit
Sunrise School, 22300 SW 162 Ave.	.015	23.3	Soakage Pit
Turkey Point Power, Palm Dr/Biscayne Bay	.018	40.3	Gravity Well
Village Professional Bldg, 9345 NE 6 Ave.	.003	16.7	Soakage Pit

The anticipated that upgrades to existing wastewater treatment plants would accommodate the projected growth with the following plant capacities (Table 8).

Table 8
Projected Future Wastewater Plant Capacity
Miami-Dade County
1985-2005

Facility	1985 (mgd)	1995 (mgd)	2005 (mgd)
North District	80	100	120
Central District	121	133	133
South District	75	112.5	131

Source: Miami-Dade County

Miami-Dade County Stormwater Treatment

As described in the Drainage Element of the 1988 Comprehensive Development Master Plan, "the drainage system is unknown; precise locations of some older portions of it are either not known or buried among innumerable aged documents in public works departments". The element goes on to say that flood protection has declined (to unknown levels in some basins) since canals were dug because of urbanization's concomitant increase in impervious area, and a comprehensive basin-by-basin drainage engineering study could do much to expand the County's knowledge of its own drainage system.

In Table 9 below, the Miami-Dade Comprehensive plan identifies the following major canals, but does not identify secondary canals such as the L-31E, C-1W, C1-N, C-100C, C-103 S, C-103N that appear on the Primary and Secondary Canal Map Series.

Table 9
Miami-Dade County Drainage Canals
Basin Area and Design Storm

Canal Number	Canal Name	Basin Square Miles	Design Year Storm
C-9E	Snake Creek	21.8	100
C-9W	Snake Creek	17.2	-
C-8	Biscayne	31.5	100
C-7	Little River	35.0	100
C-6	Miami	69.0	100
C-4	Tamiami	60.9	100
C-5	Comfort	2.3	-
C-3	Coral Gables	18.0	25
C-2	Snapper Creek	53.0	100
C-100	Cutler	40.6	10
C-1	Black Creek	56.9	100,30,10
C-102	C-102	25.4	10
C-103	C-103	40.6	-
Military	Homestead A.B.	4.7	-
North	North	7.8	-
Florida City	Florida City	12.5	-
Model	North and South Model Land	28.1	-
C-111	C-111	100.0	10

Source: Miami-Dade County

Municipal Systems in Miami-Dade County

C. City of North Miami

City of North Miami Water Treatment

The City of North Miami reports on its website that the Water Treatment Plant and Sunkist Grove to be capable of treating 9.3 mgd with an average treatment of 8.7 mgd or 60 percent of the City's total demand of 13.5 mgd. Interconnections with Miami-Dade Water and Sewer supply the other 40 percent.

In the 1991 City of North Miami Comprehensive Plan the City identifies that groundwater is treated at the Norman Winson Water Plant. The City's permit from the District allows for the removal of 9.3 mgd with actual withdrawal rates averaging 8 mgd. Supplemental water is provided through multiple connections to the WASD water transmission system. The City identifies WASD water facility capacity as 383 mgd. The City's service area is approximately 13 square miles and serves an estimated population of 75,000 through 19,000 service connections. The City operates 255 miles of water mains.

City of North Miami Sanitary Sewer Treatment

In the 1991 City of North Miami Comprehensive Plan the City identifies that it operates a sewage collection and transmission system with an irregular service area. The system consisted of 40 City-owned wastewater lift stations, six of which are outside the City limits, 67 privately owned wastewater lift stations, approximately 115 miles of gravity sewers, 110 miles of service laterals, and 15 miles of pressure sewers. The sewer system provides service to 12,000 accounts with an estimated population of 57,000. The City's sewage is transmitted to the North Miami-Dade County District Regional Plant located at N.E. 154 Street operated by WASD. The plant was reported to have a design capacity of 80 mgd with reported flows of 76.7 mgd. The City also reported that the County was preparing to expand the system by 20 mgd by 1995, which would provide capacity to at least the year 2000.

D. City of North Miami Beach

City of North Miami Beach Water Treatment

In the 1991 City of North Miami Beach Comprehensive Plan the City identifies that the entire City is served by public water lines. The City's Utilities Department is responsible for some of the water supply and treatment, and all of the distribution. About 25 percent of the City's system service area is within the City limits. The City obtains about one-half of its water from WASD. The City identifies its water treatment plant rated capacity at 17.6 mgd with an average daily demand of 25.5 mgd. The City reports that the WASD plants serving the Northern Miami-Dade County District will have a capacity of 245 mgd by 1998.

The City identifies that is was preparing to replace its 10 existing wells with two new and more efficient wells located near the Turnpike.

City of North Miami Wastewater Treatment

In the 1991 City of North Miami Beach Comprehensive Plan the City identifies that about one-third of the City is served by sanitary sewers. The WASD is the service provider for collection and treatment. The City identifies that it generates approximately 3.3 mgd of waste with projected increases in flow to 4.6 mgd by 1996 and 4.7 by 2006. The City reports that treatment is provided by the WASD North District wastewater treatment plant located at N.E. 151 Street and that the plant is rated for 80 mgd. The City reports that this plant is undergoing an expansion to 100 mgd by 1996 and 120 mgd by 2006 and has a current average flow of 75.5 mgd.

Although the City of North Miami Beach and North Miami Comprehensive plans were submitted in 1991 and use the same WASD treatment facility, each plan reports different capacities for that facility.

E. City of Homestead

City of Homestead Water Treatment

In the 1995 City of Homestead adopted Comprehensive Plan the City report current water service to over 7,200 metered customers. The Homestead Water Treatment Facilities are located at Harris Field and Wittkop Park. Two wells at Harris Field provide 2.16 mgd and four wells at Wittkop Park produce 4.42 mgd. Treatment capacity is 17 mgd with a reported allocation of 9.9 mgd and an average use of 5.3 mgd. By 2010, the City projected that it will need 11.9 mgd to serve the projected population. The City proposed to add two new 2.16 mgd well at Harris Field

to meet the anticipated need by the 2010. If these projections remain accurate, there will be no available capacity after the 2010. Current trends indicate that the Homestead area is receiving significant amounts of residential development.

City of Homestead Wastewater Treatment

In the 1995 City of Homestead adopted Comprehensive Plan the City reports that in 1975, largely due to the anticipated growth at the Villages of Homestead DRI, the City's 750,000 gpd wastewater treatment plant was increased to 2.25 mgd. Through an agreement with Miami-Dade County, 800,000 gallons are diverted to the County's pump station #691 daily. Thus, the capacity available in the City wastewater system is 3.05 mgd with an allocation of 3.175 mgd.

Homestead reports approximately 80 miles of sewer lines with 37 pump stations owned by the City and four privately owned. The system served 4,790 customers, some of which were located outside of City limits. The City reports that it will reach capacity of the existing system by 1997 and that the City is in the process of expanding the system to 6 mgd to meet the City's needs for the year 2010. It was unclear, whether or not the existing treatment facility was being expanded or a new facility was considered for construction.

F. City of Florida City

City of Florida City Water Treatment

The 1990 City of Florida City adopted Comprehensive Plan identifies that the City's water treatment plant draws from four wells and has a total design capacity of 4.1 mgd with a permitted capacity of 3.55 mgd. The City had a 1987 demand of 1.34 mgd with a projected demand of 2.937 mgd in 2030.

City of Florida City Wastewater Treatment

The City reports that the water treatment plant rated with a capacity of 2.376 mgd was closed in 1989 and that wastewater treatment is provided by Miami-Dade County at the South Miami-Dade Sewage Treatment Facility.

G. City of Opa-Locka

City of Opa-Locka Water Treatment

The 1990 City of Opa-Locka proposed Comprehensive Plan identifies that the city owns and operates the water distribution system and that WASD supplies the water from the Hialeah/Preston Water Treatment Plant. The service area is approximately 6 square miles with 3,533 connections within the City and 1,237 outside the City limits. The main pump is located near NW 135 Street and NW 32 Ave. In 1988 the City reported an average daily consumption rate of 3.071 mgd. No specific plant capacities are identified.

City of Opa-Locka Wastewater Treatment

The 1990 City of Opa-Locka proposed Comprehensive Plan identifies that 98 percent of the City is sewered. The City owns and operates a municipal sanitary sewer collection system that is conveyed to WASD for treatment and disposal. The City reported that the capacity of the

collection system for the Master Station is 4.9 mgd and 7.2 mgd for the 16-inch force main. Current demand was reported at 3.7 mgd.

Broward County

Broward County Water Treatment

In 1987, the Biscayne Aquifer supplied one hundred percent of the drinking water in Broward County. Thirty-one (31) public and private water utilities provide potable service in Broward County. Seven of the utilities supply water to the unincorporated area including the five local government utilities of Broward County, Pompano Beach to 1,606 residents, Sunrise to 16,653 residents, Tamarac to 1,499 residents, and Ft. Lauderdale to 18,962 residents. The two private utilities of Ferncrest and University also provide service within Broward County. However, Ferncrest, which provided service for 3,949 people in to two mobile home parks, was closed in 1987 and the Town of Davie is identified as providing potable water service. University provided service to 1,154 residents.

Broward County operates three utility districts consisting of seven water treatment plants. Peak demand for all systems in the County is identified in Table 10.

District 1, serves 66,510 residents in portions of Northeast and Northwest Broward. District 1 is comprised of three treatment plants: 1A, 1B, and Broadview. Plants 1A and Broadview are operated twenty-four hours a day, while 1B is maintained on stand-by to serve peak periods. System 1A is interconnected with 1B. System 1B and 1C are interconnected. System 1A and Broadview were not interconnected in 1989. The design capacity for 1A is 10.5 mgd. 1B has a treatment design capacity of 2.0 mgd. Broadview also has a design capacity of 2.0 mgd. There are currently seven wells serving District 1. The overall wellfield capacity is 15.1 mgd. In 1987, the total flow was calculated at 11.0 mgd.

District 2, serves 53,744 residents in Northeast Broward. District 2 is comprised of one treatment plant known as 2A. The plant operates twenty-four hours a day and has a design capacity of 25.9 mgd. There are nine wells serving District 2.

District 3, serves 44,662 residents in portions of Southeast Broward. District 3 includes three treatment plants: 3A, 3B, and 3C. The 3A treatment plant contains two individual treatment units, and has a design capacity of 5.3 mgd. The plant operates twenty-four hours a day and there are four wells serving the plant.

System 3B consists of three individual treatment units and has a design capacity of 3.7 mgd and operates twenty-four hours a day, however, a 0.5 mgd unit "A" is used to treat backwash water and is not used to treat water from the wells. Occasionally the unit is placed in service to assist during peak flows. There are four well on-site and the 3B treatment plant is not interconnected to 3A.

System 3C consists of one 1.0 mgd treatment unit, which is operated eight to sixteen hours per day and there are two well on-site. The 3C treatment plant is not interconnected to either 3A or 3B.

It was anticipated that by 1990, the projected demand of the 1A, 1B and 1C would exceed the capacity of the plants. The proposed improvements included expanding the existing capacity from 10.5 mgd to 15 mgd to meet the build-out needs of 14.2 mgd. The 15 mgd capacity was

projected to meet District 1 needs up until the year 2020. In terms of wellfield capacity, the County estimated the need for one or two new wells at a cost of $9.6 million in 1980 dollars.

The 2A treatment plant was identified with a need to expand by 25 mgd to 45 mgd to meet the needs until the year 2005. Estimated cost for the expansion was projected at $36 million.

In District 3, the 3A treatment plant was identified with a 2.1 mgd surplus in 1989 but had serious corrosion problems that threatened the plants potential to provide adequate service. An expansion from 5.3 mgd to 10.7 mgd to the 3A plant was scheduled. The 3A wellfield was in imminent danger of saltwater intrusion. New wellfields in the South System were projected to provide adequate service through the year 2020.

Table 10
Projected Average Daily and Peak Day Water Demand for
Broward County, Private and Municipal Utilities Service Areas
Broward County
1990-2000

	1990			1995			2000		
Facility	Avg. (mgd)	Peak (mgd)	Capacity (mgd)	Avg. (mgd)	Peak (mgd)	Capacity (mgd)	Avg. (mgd)	Peak (mgd)	Capacity (mgd)
1A, 1B and Broadview	9.0	12.4	14.5	9.5	13.0	15.0	9.9	13.5	15.0
2A	14.0	31.25	45.0	14.8	23.0	45.0	15.3	23.7	45.0
3A	2.8	3.7	5.3	6.8	8.1	10.7	7.2	8.6	14.7
3B	3.6	3.9	3.7	NA	NA	NA	NA	NA	NA
Ferncrest		.54	.99	1.0	.55	1.0	1.0	.55	1.0
1.0									
University	.35	.73	1.0	NA	NA	NA	.5	1.0	1.0
Pompano Beach	20.0	30.2	40.0	NA	NA	40.0	22.4	33.8	40.0
Ft. Lauderdale	50.21	80.3	90.0	50.46	NA	90.0	52.48	80.3	90.0
Tamarac	5.5	4.7	12.0	NA	NA	20.0	6.45	9.0	20.0
Sunrise	11.12	17.7	20.5	NA	NA	22.5	14.7	23.4	30.0

Source: Broward County

Population estimates for each water treatment plant service area is provided in Table 11.

Table 11
Population Projections for
Broward County, Private and Municipal Utilities Service Areas
Broward County
1990-2000

Facility	1990 Est. Pop.	1995 Est. Pop.	2000 Est. Pop.
1A, 1B and Broadview	69,215	70,634	71,613
2A	56,759	59,279	60,595
3A	17,283	18,454	19,625
3B	16,380	16,434	16,488
Ferncrest	4,995	NA	5,167
University	2,988	NA	4,199
Pompano Beach	92,865	NA	102,458
Ft. Lauderdale	218,535	219,622	273,965
Tamarac	43,983	NA	50,734
Sunrise	106,864	NA	195,457

Source: Broward County

Broward County Wastewater Treatment

In 1989, the Broward County Comprehensive Plan identifies that there are twenty (20) public and private facilities licensed by the County to provide sanitary sewer service in Broward County. Average demand and design capacity for each facility is provided in Table 12.

Seven utilities supply wastewater services to the unincorporated area. One private facility, Ferncrest, and the municipalities of Cooper City, Fort Lauderdale, Hollywood, Margate, Oakland Park, and Sunrise. (Broward County Comprehensive Plan (1989), Volume 4, Support Documents, page 12-3). The number of wastewater plants in Broward County has been reduced from 118 to 28 since 1974. (ECQB Annual Report, 1985-86)

Ferncrest Utilities provides secondary wastewater treatment service to approximately 4,000 residents of the Everglades Mobile Home Park and the University Mobile Home Park. The plant was identified in 1989 to have a .1 mgd surplus over peak flow. Effluent disposal is through discharge into a 110-acre rock pit.

In 1989, Cooper City System II wastewater plant was to have been expanded and a new 5 mgd System III plant constructed, in 1990 with a life expectancy of 20 years. The System II and III plants would be interconnected and effluent disposal for both plants is by deep well injection. However, in 1987 the EQCB reported the disposal method as Ocean Outfall.

The Broward County Utilities Division (BCUD) provides wastewater service in three Districts. Generally the service areas are the unincorporated areas, however, some portions of are within municipalities.

District 1 primarily serves East Central and West Central Broward County with portions of the Northeast and Northwest served. The total population served is 57,116. District 1 is described as

composed of mini-sewer systems 1A, 1B, and 1C. There are approximately 120 miles of gravity sewer, twenty miles of force main, and fifty-one pump stations and three regional pump stations.

District 2 serves residents in Northeast Broward County. The total population served is 61,232. District 2 is described as composed of several mini-sewer systems with approximately 160 miles of gravity sewer pipe, twenty-five miles of force main and ninety-one pump stations.

District 3 serves residents in Southeast Broward County, including the Fort Lauderdale/Hollywood International Airport. Development District 3 is subdivided into systems 3A, 3B, and 3C and is composed of mini-sewer systems with twenty-five miles of gravity pipe, seventeen miles of force main, and thirty-five pump stations. The total population served in 15,895 with the 1989 Broward County Comprehensive Plan rating the airport terminal rated at 500,000 gpd.

For the Hollywood wastewater treatment facility, the County estimates the 1987 served population as 188,000; however, in the County's 1990 to 2000 population projections by utility, the County estimates a 1990 population of only 139,802 and a year 2000 service population of 141,629, nearly 46,371 less people than were estimated to be already served. It is not known how this undercounting of the service population impacted land use or capital facilities programming.

In 1996, a Development of Regional Impact Application for airport expansion was submitted. Included in the data and analysis section for wastewater were estimates for up to 644,850 gpd by the year 2010. Interesting for wastewater and potable water service, the DRI application indicates that if Hollywood or Broward County were unable to supply service, the Airport would construct and maintain its own utility system. The Hollywood treatment plant is identified with a 37.5 mgd permitted capacity and the Hollywood plant was projected to have a design capacity of 48.0 mgd by 1995.

Broadview System serves an area within District 1. The population served is 8,993. Broadview was reported to have about eight miles of gravity pipe, 9,000 feet of force mains, and six pump stations and was to be integrated into District 1, but no time frame was indicated.

The North Regional Wastewater Treatment System provides wastewater treatment for large users in the northern part of Broward County. Large user agreements have been executed with Coconut Creek, Coral Springs, Deerfield Beach, Lauderhill, N. Lauderdale, N. Springs Improvement District, Oakland Park, Pompano Beach, Tamarac, and University Utilities. Table 13 summarizes existing demand in the North District and Table 14 summarizes projected service populations for the North District utilities.

The design capacity of the North Regional Treatment Plant is 66 mgd; however, the ultimate plant capacity is projected to be 90 mgd on a maximum monthly flow basis and 75 mgd on a yearly average with a recommendation to expand the plant to 80 mgd by 2005. Table 15 summarizes wastewater treatment plant data for the North Regional Treatment Plant and indicates that design capacity will be 96 mgd rather than 90 mgd as indicated in the data and analysis.

Problems were identified in transmitting flows northward through the State Road 7 (U.S. 441) Highway system in 2005 under peak hourly conditions and in 1989 the transmission main was described as barely adequate to handle the flow. Another area of concern were the need to rehabilitate six master lift stations at Broadview, Coral Springs East, Coral Springs West, Lauderdale Lakes, North Lauderdale and Tamarac. With a high priority redevelopment effort beginning on the State Road 7 corridor, adequacy of the wastewater system will need to be

evaluated in greater detail. In Districts 3A, 3B, and 3C, force main improvements, seventeen pump stations, and twelve gravity main improvements were also identified.

The average monthly flows and design capacities for all wastewater treatment systems in Broward County are summarized in Table 16.

Table 12
Average Daily and Peak Wastewater Demand for
North Regional Treatment Plant, Private and Municipal Utilities
Broward County
1987

Type of Facility	Demand		Design Capacity (mgd)	Method of Disposal	Treatment
	Avg. Daily (mgd)	Peak Day (mgd)			
Broward County N. Reg. Treat Plant 2401 Powerline Rd Pompano Beach	49.0	83.0	66.0	Ocean Outfall	Secondary
Cooper City Wastewater Plant 9070 S.W. 51 St Cooper City	.71	.78	3.46	Ocean Outfall	Secondary
Ft. Lauderdale G.T. Lohmeyer Port Everglades Ft. Lauderdale	30.4	60.8	38.0	Deep Well Injection	Secondary
Hollywood Wastewater Plant 1621 N. 14th Street Hollywood	32.8	36.8	38.0	Ocean Outfall	Secondary
Margate Wastewater Plant 1001 W. River Dr Margate	6.3	8.2	6.5	Deep Well Injection	Secondary
Sunrise II and III Wastewater Plant 8700 SW 19 Pl. #2 14150 NW 8 St #3	4.5 (combined)	5.7	6.0 (combined)	Deep Well Injection	Secondary
Ferncrest Utilities 3015 SW 54 Ave Ft. Lauderdale	.4	.5	.6	Pond	Secondary

Source: Broward County

Table 13
Wastewater Demand for
North Regional Treatment Plant, Private and Municipal Utilities
Broward County
1987

Facility	Demand Avg. Daily (mgd)	Avg. Daily Per Capita (gpd)	Est. Population
N. Reg. Treat Plant	49.0	120	410,000
Cooper City	.71	103	17,000
G.T. Lohmeyer	30.4	195	156,000
Hollywood	32.8	174	188,000
Margate	6.5	124	47,265
Sunrise II and II	4.5	132	34,000
Ferncrest Utilities	.4	93	4,100

Source: Broward County

Table 14
Population Projections for
North Regional Treatment Plant, Private and Municipal Utilities Service Areas
Broward County
1987-2000

Facility	1987 Est. Pop	1990 Est. Pop.	1995 Est. Pop.	2000 Est. Pop.
N. Reg. Treat Plant	410,000	468,294	526,753	566,903
Cooper City	17,000	20,450	25,240	29,694
G.T. Lohmeyer	156,000	153,833	154,030	NA
Hollywood	188,000	139,802	140,505	141,629
Margate	47,265	48,675	NA	59,095
Sunrise II and II	34,000	73,174	82,027	87,036
Ferncrest Utilities	4,100	4,957	NA	5,167

Source: Broward County

Table 15
Projected Average Daily and Peak Day Wastewater Demand for
North Regional Treatment Plant, Private and Municipal Utilities Service Areas
Broward County
1990-2000[27]

	1990			1995			2000		
Facility	Avg. (mgd)	Peak (mgd)	Capacity (mgd)	Avg. (mgd)	Peak (mgd)	Capacity (mgd)	Avg. (mgd)	Peak (mgd)	Capacity (mgd)
N. Reg. Treat Plant	65.0	83.0	68.0	73.0	90.0	96.0	78.0	95.0	96.0
Cooper City	2.04	2.78	3.5	3.5	NA	4.5	4.6	NA	6.5
G.T. Lohmeyer	33.59	37.52	38.0	34.24	38.25	48.0	NA	NA	48.0
Hollywood	31.35	NA	38.0	34.49	NA	59.01	38.63	NA	59.01
Margate	6.58	NA	11.5	7.44	NA	11.5	8.29	NA	11.5
Sunrise II and II	5.96	NA	6.0	7.11	NA	11.0	8.53	NA	11.0
Ferncrest Utilities	.4	.5	.6	.4	.5	.6	.4	.5.	.6

Table 16
Average Monthly Flows and Design Capacity
Broward County EAR 1995[28]

	Monthly Avg. (mgd)	Design Capacity (mgd)
BCUD #4	69.7487	88.487
Cenvil (Pembroke Pines)	3.1351	6.891
Cooper City West	2.2148	5.196
CSID	4.3979	6.207
Davie II	2.1414	3.645
Daystar	0.0004	0.035
Fernstar	0.2664	0.860
G.T. Lohmeyer (Ft. Laud.)	39.2764	46.219
Hollywood	30.7803	15.656
Plantation	12.8308	16.852
South Broward Utilities	0.4709	1.486
Sunrise Regional	1.3568	3.643
	191.6264	266.629

The Broward County Office of Environment Services (OES) currently provides limited information about its Industrial Pretreatment Program and effluent limitations on its website located at http://www.broward.org/oes/oei00900.htm. Although not currently available, the

[27] Source: Broward County

website is scheduled to provide a GIS-based map of the service area of the Broward County North Regional Wastewater Treatment Plant (BCNRWWTP).

Information about what Drainage District boundary your property is located in is provided on the OES website at http://www.broward.org/oes/wmi04000/index.html. The map is quite useful and easy to use. Additionally, OES provides general map information related to Water Control Districts and Flood Elevations. Information about drainage, water and sewer can be searched by parcel address at the OES website at http://lsta.co.broward.fl.us/website/dws/viewer.htm.

Since 1993, Broward County has embarked on the Neighborhood Improvement Program (NIP). Among other things, this program constructs various public works projects within eight (8) unincorporated communities in Broward County. A main focus of the NIP has been a series of drainage projects in areas experiencing inadequate drainage, aging potable water infrastructure, and a lack of sanitary sewer service. By 2011, the NIP program will eliminate 10,252 septic tanks and provide 617 miles of pipeline in addition to other community infrastructure at a cost of $629 million.

Broward County Stormwater Treatment

In Broward County there are thirteen independent and eight dependent special taxing districts, which are responsible for operating and maintaining drainage systems within their boundaries. The independent water management districts issue surface water management permits within their respective districts.

Broward County Independent Drainage Districts

Bailey Drainage District (BDD)
Central Broward Drainage District (CBDD)
Coral Springs Improvement District (CSID)*
Plantation Acres Improvement District (PAID)
Indian Trace Community Development District (ITCDD)
North Lauderdale Water Control District (NLWCD)
North Springs Improvement District (NSID)*
Old Plantation Water Control District (OPWCD)*
Pine Tree Water Control District (PTWCD)
South Broward Drainage District (SBDD)
Sunshine Water Control District (SWCD)
West Lauderdale Water Control District (WLWCD)
Turtle Run Community District (TRCD)

*Act as permitting authority for projects less than 40 acres.

Broward County Dependent Drainage Districts

Cocomar Water Control District
Twin Lakes Water Control District
Lauderdale Isles Water Control District
Water Control District #2
Water Control District #3
Water Control District #4
Ravenswood Water Control District
Sunrise Drainage District

The service areas and design capacities for primary canals in Broward County is summarized in Table 17.

Table 17
Service Areas and Design Capacity for Primary Canals and Special Taxing Districts in Broward County
Broward County 1987[29]

Primary Canal	Special Taxing District	Acres Served	Design Capacity (csm)*
C-11	Bailey Water Control District	1,500	20
C-11	Central Broward Drainage District	29,000	20
C-14	Coral Springs Improvement District	5,100	70
NNRC	Plantation Acres Improvement District	5,100	71
C-11	Indian Trace Community Development District	12,800	40
C-14	North Lauderdale Water Control District	1,600	70
C-14	North Springs Improvement District	4,800	70
NNRC & C-12	Old Plantation Water Control District	10,000	71
Hillsboro	Pine Tree Water Control District	2,900	35
C-9 & C-11	South Broward Drainage District	44,100	**
C-14	Sunshine Water Control District	5,550	70
NNRC	West Lauderdale Water Control District	1,500	71
C-14	Turtle Run Community District	600	70

*csm = cubic feet/second/square mile
** 20 csm to C-9 Canal and 20 csm to C-11 Canal west of 15th Avenue, 40 csm to C-11 east of 15th Avenue.
NNRC = North New River Canal

[29] Source: Broward County

Municipal Systems in Broward County

H. City of Fort Lauderdale

The City of Fort Lauderdale's Water and Wastewater Master Plan identified capital improvements necessary to meet to the needs of the Fort Lauderdale service area through the year 2020. The plan considers issues related to aging infrastructure, redevelopment with higher densities, and sewering of areas on septic tank. The plan also identifies existing deficiencies.

City of Fort Lauderdale Wastewater Treatment

The City provides wastewater treatment to approximately 182,785 people in central Broward County. Approximately 70 percent of the service population resides within the City. Nearly 47,199 people within the City's service area use septic systems. By 2020, the City estimates that it will provide service to 253,224 people.

The George T. Lohmeyer Regional Wastewater Treatment Plant is owned and operated by the City and is the only wastewater treatment facility in the service area. The wastewater treatment plant is identified to have a treatment capacity of 43 mgd with a pending application to increase the capacity to 54 mgd. Treated effluent is discharged to five injection wells. The wastewater transmission system consists of 340 miles of gravity sewers, 110 miles of force main, and 144 City-owned wastewater pump stations. The City also identified 59 private lift stations and acknowledges that information on many of the private lift stations is not available. Except for unincorporated area, each municipality in the service area owns and operates the wastewater collection facilities within its jurisdiction. The City has large user wastewater agreements with Oakland Park, Wilton Manors, Tamarac, Davie, and Port Everglades.

Daily flows of the George T. Lohmeyer Wastewater Plant are included in Table 18. Forecast flows for the George T. Lohmeyer Wastewater Plant are included in Table 19. Population projections, by service area, for the George T. Lohmeyer Wastewater Plant are provided in Table 20.

Table 18
Daily Wastewater Flows (mgd) for
George T. Lohmeyer RWWTP
1988-1999[30]

	Average Daily Flow	Max Daily Flow	Max Hour Flow
1988	32.10	40.7	63.3
1989	33.33	46.9	75.2
1990	34.03	49.1	70.7
1991	35.44	66.9	75.9
1992	36.27	58.1	67.0
1993	36.97	59.2	84.7
1994	39.51	69.8	77.8
1995	40.68	67.8	75.3
1996	36.51	66.4	75.3
1997	37.74	65.7	74.5
1998	32.91	65.2	71.0
1999	36.34	75.3	78.2

Table 19
Forecast Systemwide Nonresidential Wastewater Flows
George T. Lohmeyer RWWTP
2000-2020[31]

Year	Service Population	Residential AADF (mgd)	Nonresidential AADF (mgd)
2000	189,984	13.3	5.7
2005	213,136	14.9	6.9
2010	240,373	16.8	8.4
2015	243,312	17.0	9.1
2020	253,224	17.7	10.1

[30] Source: City of Fort Lauderdale
[31] Source: City of Fort Lauderdale

Table 20
Population Estimate Comparisons for
City of Fort Lauderdale
Wastewater Planning Area
1995-2020[32]

Jurisdiction	2000	2005	2010	2015	2020
Fort Lauderdale					
Sewered – Resident	118,349	121,472	124,285	125,053	131,340
Sewered – Seasonal	10,576	10,345	10,164	9,997	10,034
Non-sewered	38,892	39,841	40,639	41,401	42,732
Oakland Park					
Sewered – Resident	25,887	26,504	26,914	27,115	27,652
Sewered – Seasonal	1,065	1,058	1,045	1,029	1,039
Non-sewered	1,080	1,147	1,193	1,259	1,325
Tamarac					
Sewered – Resident	830	884	936	954	982
Sewered – Seasonal	36	37	39	38	38
Non-sewered	0	0	0	0	0
Wilton Manors					
Sewered – Resident	12,188	12,410	12,434	12,857	13,240
Sewered – Seasonal	252	245	230	238	236
Non-sewered	0	0	0	0	0
Davie					
Sewered – Resident	20	36	52	71	93
Sewered – Seasonal	0	0	0	0	1
Non-sewered	0	0	0	0	0
Unincorporated					
Sewered – Resident	12,671	13,375	14,050	14,768	15,714
Sewered – Seasonal	911	905	913	927	970
Non-sewered	7,227	7,376	7,478	7,604	7,828
Total					
Sewered – Resident	169,945	174,681	178,671	180,818	189,021
Sewered – Seasonal	12,840	12,591	12,392	12,230	12,318
Non-sewered	47,199	48,364	49,310	50,264	51,885
Total Population	229,984	235,437	240,373	243,312	253,224

[32] Source: City of Fort Lauderdale

I. City of Hollywood

City of Hollywood Water Treatment

The City of Hollywood reports on its website that the Brian Piccolo Water Treatment Plant is rated for 36 mgd with approximately 500 miles of distribution lines. There are 21 wells that draw water from the Biscayne Aquifer and 4 wells that draw from the Floridan Aquifer.

In the 1996 City of Hollywood EAR, the City reports that the City's water plant has a design capacity of 37.5 mgd with an existing average demand of 18 mgd. Starting in January 1996, the City is contractually obligated to provide potable water to parts of unincorporated Broward County south of the City, increasing the average demand to 21 mgd. The City also anticipated providing services to unincorporated Broward County north of Sterling Road, increasing the average demand to 24 mgd.

City of Hollywood Wastewater Treatment

The City of Hollywood reports on its website that its Wastewater Treatment Plant is rated for 42 mgd with approximately 210 miles of distribution lines. There are 63 city-owned wastewater lift stations and 88 privately owned lift stations.

In the 1996 City of Hollywood EAR, the City reports that the City Wastewater Treatment Plant was upgraded to 42 mgd and should provide sufficient capacity until 2010. Additional plant upgrades would allow for additional plant capacity by 3 to 4 mgd.

It should be noted that the City of Hollywood has an exceptional webpage located at http://www.hollywoodfl.org/pub-util/tour-sewer.htm that describes the water and wastewater treatment process in great detail and animation.

J. City of Pompano Beach

City of Pompano Beach Water Treatment

In the 1996 EAR for the City of Pompano Beach, the City identified that four water treatment plants serve it. The City-owned water treatment plant at 301 NE 12 Street provided drinking water to 85 percent of the City's land area. The plant was reported with a design capacity of 40 mgd with a demand of 17.47 mgd. By 1998, the City projected that average daily flows would increase to 23.1 mgd.
Broward County Utilities operated two water treatment plants that served portions of Pompano Beach. Broward County 2A Water Treatment Plant at 1390 NE 50 Street provided drinking water to the northwest portion of the City. Broward County 2A Water Treatment Plant is reported to have a design capacity of 20 mgd with a current demand of 11.15 mgd in 1989.

Broward County 1A Water Treatment Plant at 3701 N SR 7 provided drinking water for a small portion of the southwest part of the City. Broward County 1A Water Treatment Plant is reported to have a design capacity of 10.5 mgd with a current demand of 7.4 mgd in 1989. The capacity and demand data for 1A and 2A are slightly different from the data reported by Broward County above.

The City of Margate Water Treatment Plant located at 1001 W River Drive served the western portion of the City. The Margate Water Treatment Plant is reported to have a design capacity of 18 mgd with a current demand of 8 mgd in 1989.

City of Pompano Beach Wastewater Treatment

In the 1996 EAR, the City of Pompano Beach identifies that the Broward County North District Regional Wastewater Facility and the City of Margate Wastewater Treatment Plant provide wastewater treatment. Approximately 85 percent of the City's wastewater was sent to the Broward County North Facility. The City reports the design capacity of the North Facility as 80 mgd with a current demand of 64.88 mgd. In 1994, the City amended its Large User Agreement with the County for a reserve capacity of 17.26 mgd. The City identified its current flow to the County North Facility as 11.91 mgd. These capacity figures are slightly different than those reported by Broward County above.

The capacity of the Margate Wastewater Treatment Plant was identified as 11.75 mgd with a current demand of 7.63 mgd. In 1994, the City of Margate identified capacity at its Wastewater Treatment Plant to be 8 mgd.

K. City of Margate

City of Margate Water Treatment

In the 1989 City of Margate adopted Comprehensive plan the City identifies that its water treatment facility has a design capacity of 18 mgd with an average daily demand of 6.86 mgd. The permitted capacity is identified as 13.3 mgd. The City draws drinking water from 12 wells, seven of the wells are within on the treatment site and five are located in Vinson Park. There are approximately 40 miles of major distribution mains and 150 miles of transmission lines. Allocated capacity is distributed between the City of Margate, City of Coconut Creek, and Pompano Beach.

City of Margate Wastewater Treatment

In the 1989 City of Margate adopted Comprehensive Plan the City identifies that the Wastewater Treatment Plant is divided into two parcels by NW 66 Ave. The west parcel contains a treatment capacity of 5 mgd and the east parcel contains a treatment capacity of 3 mgd for a total Margate Wastewater Treatment Plant capacity of 8 mgd. The City reports an average daily flow of 5.42 mgd in 1986 with projections of 7.84 mgd by 2000. Based on these projections, the City identifies that it will need to increase the capacity of the wastewater treatment plant to 11.75 mgd scheduled to be complete by 1992.

The City owns and operates 46 wastewater lift stations. Additionally there are 6 private wastewater lift stations and there are 21 miles of force mains. Effluent is discharged through deep well injection. The disposal well has a design capacity of 17 mgd. An emergency outfall is connected to the Margate Canal, which is hydrologically connected to the C-14 canal.

L. City of Sunrise

City of Sunrise Water Treatment

In the 1989 City of Sunrise adopted Comprehensive Plan the city identifies three water treatment facilities with a combined 250 miles of water distribution mains. The City also provides service to unincorporated Broward County, Boneventure, Weston, Davie and Plantation.

The Sunrise Water Treatment Plant No. 1 (North Plant) is located between Springtree Drive and NW 44 Street. The North Plant consists of 16 raw water supply wells with a production capacity of 22 mgd. The water treatment facility has a rated capacity of 16 mgd with a 12 mgd expansion underway at that time. The service area is approximately 12 square miles.

Sunrise Water Treatment Plant No. 2 (South Plant) was acquired from the Pine Island Utilities Corporation. The plant is located at SW 21 Street and Pine Island Road. The site contains both water and wastewater treatment. The service area is approximately 9 square miles and includes a portion of unincorporated Broward County and the Town of Davie. The South Plant consists of 7 raw water wells with a production capacity of 6.5 mgd.

Sunrise Water Treatment Plant No. 3 (Malaleuca Isles Plant) was acquired from the City of Plantation and is located in Plantation. The plant draws raw water from 3 wells. Two of the wells are located on-site. The plant has a rated capacity of 2 mgd and was operating on standby basis.

City of Sunrise Wastewater Treatment

In the 1989 City of Sunrise adopted Comprehensive Plan the City identifies that there are three wastewater facilities within the City with a combined 250 miles of wastewater collection mains and 125 wastewater lift stations. The City provides service to unincorporated Broward County, Boneventure, Weston, Davie and Plantation.

Sunrise Wastewater Treatment Plant No. 1 (North Plant) is located between Springtree Drive and NW 44 Street. The North Plant was identified with a 9 mgd capacity in 1989. The North Plant has a permitted capacity of 7.5 mgd with an application pending for an addition 1.5 mgd. Average daily from was 7 mgd in 1987. Treated effluent is pumped through an 8-mile long force main for disposal by deepwell injection with a permit for 30 mgd. The North Plant district has 64 wastewater lift stations.

Sunrise Wastewater Treatment Plant No. 2 (South Plant) was acquired from Pine Island Utilities Corporation and is located at SW 21 Street and Pine Island Road. The South Plant has a design treatment capacity of 4.5 mgd but was configured in a way to limit treatment capacity to 3 mgd. The South Plant had a temporary permit capacity of 2.75 mgd that could increase to 3 mgd if effluent standards are met. Average daily flow was 2.25 mgd in 1987. Effluent is pumped six miles to the deepwell injection site at the Wastewater Treatment Plant No. 3. The South Plant district has 33 wastewater lift stations.

Sunrise Wastewater Treatment Plant No. 3 (West Broward Plant) was acquired from the City of Plantation and is located at NW 8th Street and NW 136 Avenue. The West Broward Plant consists of a 1 mgd package plant and a 2 mgd package plant. Permitted capacity is 3 mgd. Average daily flow was 2.78 mgd in 1987. The West Broward Plant district has 18 wastewater lift stations.

Monroe County

Monroe County Water Treatment

The Florida Keys Aqueduct Authority (FKAA) provides potable water service in Monroe County. The FKAA is a closed system and is not connected to any other water supply system. Emergency pumping stations are located at Florida City with 9 MG capacity; Ramrod Key with 12 MG capacity; and Stock Island with 5 MG capacity. The FKAA is currently implementing underground storage and recover (ASR).

FKAA has a reverse osmosis desalinization plant at Stock Island with a treatment capacity of 2.7 MGD. The plant can be operational in 48 hours but has a high production and maintenance costs due to the age of the membrane technology used.

The FKAA operates 37 miles of a 36-inch diameter pipe from Florida City to Tavernier, 43 miles of 30-inch diameter pipe from Tavernier to Marathon. 24-inch diameter pipe from the west end of the Seven Mile Bridge to Upper Sugarloaf Key, and 18-inch diameter pipe from Upper Sugarloaf Key to Key West. Portions of the 18-inch pipe were part of the original transmission line installed in the 1940's. The 18-inch main used from Upper Sugarloaf to Stock Island did not have enough capacity to achieve build out in these areas. There are 430 miles of distribution lines in the Keys via separate storage tanks and pump stations.

Monroe County Wastewater Treatment

In 1937, the Florida Legislature created the Florida Keys Aqueduct Commission (FKAC). In 1940, an agreement with the U.S. Navy and FKAC shared the cost of constructing a water main from the mainland. An 18-inch main was constructed with financial assistance from the Farmer's Home Administration. In 1970, the Florida Keys Aqueduct Authority replaced the FKAC.

The County will currently only provide service to areas within 1 mile of the main but will not serve National Wildlife Refuges and designated hardwood hammock areas. Crocodile Lake Nation Wildlife Refuge, Key Deer National Refuge, and Schaus Swallowtail Refuge are excluded. Also excluded is all of No Name Key, portions of Big Torch Key, portions of Big Pine Key north of Watson Boulevard. Hardwood areas excluded include portions of Stock Island, small portions of Cudjoe Key, Big Pine Key Cactus Hammock and all offshore islands.

Sixty-five percent of the wastewater flow in the Keys is treated by On-Site Disposal Systems (OSDS). Package treatment plants treat the remaining 35 percent.

Aside from the City of Key West's sewage system, no other publicly operated wastewater treatment facilities are in operation in Monroe County.

The existing inventory of sanitary sewer facilities includes 24,000 septic tanks, 193 small package plants, 99 marinas with 15,000 boats, and 5,000 unpermitted and unregulated cesspools.

Due to the Outstanding Florida Water designation in Monroe County, it is perceived to be very difficult to obtain a new permit from the Department of Environmental Protection (DEP) or the Environmental Protection Agency (EPA) to construct an outfall to surface waters as a method of effluent disposal. There are six (6) wastewater treatment facilities discharging effluent via outfall to surface waters. There have been at least 10 recent enforcement actions by the DEP.

Monroe County Surface Water Outfalls

Venture Out – Cudjoe Key
U.S. Coast Guard Station – Marathon
Islamorada
U.S. Naval Air Station – Boca Chica
Waters Edge Mobile Home Park
Fiesta Key KOA

Municipal Systems in Monroe County

A. City of Marathon

The City of Marathon was incorporated in November of 1999. The City's first proposed Comprehensive Plan was submitted for agency review in June 2003. Review of the City's Sanitary Sewer, Drainage and Potable Water Elements revealed that the Florida Keys Aqueduct Authority (FKAA) provides potable water to the City. Stormwater facilities are largely to storm sewers and retention basins installed by the FDOT along U.S. 1.

City of Marathon Water Treatment

The City's current wastewater disposal system is composed of 5,595 septic systems and 71 private on-site wastewater disposal and treatment systems (Sixty-nine of which are identified in Table 21), with some wastewater flow from the private treatment plants conveyed into cesspools. According to the City's wastewater data, in the year 1996, there were 1,180 cesspits located within the City. The City's wastewater analysis describes several challenges to the existing wastewater disposal system, including 609 substandard septic systems and privately owned and maintained wastewater systems that are not currently inspected by the County or Florida Department of Health. According to the data and analysis, the Florida Department of Health does not have the legal authority to inspect these systems. Additionally, the City identifies that water quality and eutrophication of nearshore waters is a major concern. Alternative systems permitted by the Department of Environmental Protection, such as aerobic systems, may provide sufficient wastewater treatment to meet existing water-quality standards.

The data and analysis suggests seven steps that should be taken by the City to address these identified problems, including:

- Undertake steps to replace failing systems;
- Utilize alternative disposal systems that provide greater levels of treatment;
- Provide environmental education for on-site providers;
- Promote septic tank maintenance;
- Consider a municipal wastewater management system;
- Identify funding for a municipal wastewater system;
- Create a funding source for wastewater treatment; and
- Meet 1999 Florida Legislature Level of Service Standards

Review of the Goals, Objectives and Policies in the City's Sanitary Sewer, Drainage, and Potable Water Element revealed that specific action steps recommended above were not incorporated into the proposed Goals, Objectives, and Policies.

For example, Policy 3-1.2.1: On-Site Disposal System Inspection System/Compliance Program, indicates that in coordination with the Department of Health, the City will inspect on-site disposal systems; however, the data and analysis indicates that the Department of Health does not have the authority to inspect on-site disposal systems. The policy does not indicate how deficient systems that may be identified would be upgraded to meet the applicable state standards. There are no policies to encourage alternative disposal systems that provide greater levels of treatment; provide environmental education for on-site providers; promote septic tank maintenance; to consider a municipal wastewater system; or provide a funding source for wastewater treatment.

Policy 3-3.1.2, Provide Concurrency Management, indicates that the City shall provide a Concurrency Management System that will ensure that no permits will be issued for new development unless adequate surface water management facilities needed to support development at the adopted level of service standards are available. However, according to Policy 3-3.1.3, a water quality level of service standards for residential development will not be established until the effective date of the plan.

Policy 3-1.3.3: to establish an Interlocal Agreement with Key West to allow wastewater from the marina pump-out boats to be hauled and treated at the Key West Municipal Wastewater Treatment Facility, does not indicate any interim measures that will be taken to ensure that wastewater collected from the marina will be sufficiently collected and treated. On September 21, 2003, Council Staff conducted a DRI pre-application meeting with the City of Marathon for the Boot Key DRI project.

The City's table identifying DEP Permitted Wastewater Treatment Facilities, only identified sixty-nine of the seventy-one facilities identified in the County's Draft Sanitary Sewer Master Plan, March 2000. These package plants treat effluent to secondary treatment standards and then discharged through deep well injection.

Table 21
City of Marathon
DEP Permitted Wastewater Treatment Facilities[33]
2003

Facility	Permitted Capacity	Facility	Permitted Capacity
1. Hawk's Nest	0.0100	36. Galaway Bay	0.0380
2. Hampton Inn Marathon	0.0220	37. Boot Key Harbor	0.0400
3. Casa Cayo	0.0032	38. Faro Blanco	0.0100
4. USCG – Marathon	0.0025	39. Marathon Govt. Cntr.	0.0100
5. Buccaneer Resort	0.0300	40. Turtle Hospital	0.0210
6. Switlik Elementary	0.0150	41. Mid Town	0.0075
7. Lady Alex	0.0050	42. Trailerama MHP	0.0100
8. Harbor House – Marathon	0.0050	43. Gulf Shore Apts.	0.0075
9. Tropic Isle Apts.	0.0100	44. Guidance Clinic	0.0200
10. Sombrero Ridge	0.0050	45. Marathon Key Bch Club	0.0300
11. Blackfin	0.0080	46. Home Depot	0.0100
12. Marathon CC Condo	0.0080	47. Marathon Plaza	0.0050
13. Wendy's	0.0040	48. Panda House	0.0064
14. Tradewinds West	0.0064	49. Captain's Quarters	0.0030

[33] Source: City of Marathon

Table 21
City of Marathon
DEP Permitted Wastewater Treatment Facilities[34]
2003 (Cont.)

Facility	Permitted Capacity	Facility	Permitted Capacity
15. Cobia Point	0.0042	50. Coral Club	0.0050
16. Cracked Conch	0.0030	51. Dockside	0.0035
17. Harbor Club S.	0.0090	52. Island Club	0.0080
18. Marathon High School	0.0150	53. Marathon Manor	0.0150
19. Publix	0.0300	54. Schooner	0.0050
20. Sombrero Beach Village	0.0050	55. Sombrero Country Club	0.0100
21. Sombrero Resort	0.0200	56. Spanish Galleon	0.0050
22. Eastwinds	0.0600	57. Gulfside Village	0.0080
23. K-mart Shopping Center	0.0150	58. IHOP	0.0094
24. Key's RV Park	0.0150	59. Lucy's	0.0030
25. Reef at Marathon	0.0170	60. Shucker's	0.0040
26. Kingsail	0.0150	61. Seahorse Motel	0.0075
27. Marathon Airport	0.0075	62. Pizza Hut – Marathon	0.0080
28. Office Depot – Marathon	0.0085	63. Key Lime	0.0250
29. Seawatch	0.0240	64. Coral Lagoon	0.0088
30. Holiday Inn	0.0350	65. Ramada Inn	0.0250
31. Island Tiki Bar	0.0125	66. Quay – Marathon	0.0150
32. Bonefish Towers	0.0500	67. Coco Plum Apts.	0.0083
33. Marie's	0.0090	68. Royal Plum	0.0100
34. Treasure Cay	0.0050	69. Pelican Motel	0.0150
35. Jolly Roger	0.0300		

[34] Source: City of Marathon

B. City of Key West

City of Key West Water Treatment

Potable water is provided to the City of Key West through the FKAA. The City identifies the average daily flow in 1988 to be 4.82 mgd and a system capacity allocable to Key West as 4.13 mgd with an overall capacity of the system as 15.7 mgd. Potable water demand projections for the City of Key West are included in Table 22.

The City indicates that the Stock Island Reverse Osmosis Water Treatment plant is used for emergency purposes only and can be operational within 36 hours and that the plant has an operating capacity of 2.7 mgd and a 5.0 mg storage facility.

Table 22
Potable Water Demand Projections
City of Key West[35]
1991

Year	Population	Demand (mgd)
1990	24,652	4.13
1995	25,372	4.22
2000	26,119	4.23
2005	26,895	4.33
2010	27,701	4.43

City of Key West Wastewater Element

The City's wastewater treatment facility is located on Fleming Key and began operation in February 1989. All but four sections of the City are served, including an area to the southeast of the airport; an area along North Roosevelt Boulevard near the bridge to Sigsbee Park; a small area along North Roosevelt Boulevard across from the Key West Yacht Club; and parts of the City on Stock Island.

The Wastewater Treatment Plant has a design capacity of 7.2 mgd average daily flow and 10.0 mgd maximum month average design capacity. Although Table 23 identifies an annual average flow of 5.82 in 1989, the average annual flow for approximately the same period in 1990 was identified as 6.28 mgd. Additionally, the City's Sanitary Flow Projection identifies annual average flows to be 4.73 mgd and would increase to 5.16 mgd by the year 2010 with a projected population increase of 3,049 by the year 2010 over the 1990 population (Table 24). Curiously the residential population for the City in 1990 is identified in the Potable Water Element as 24,652 while the Sanitary Sewer Element provides for a population of 18,652, a difference of 6,000 people. By 2010 the population figures provided are 27,701 and 21,701, also a 6,000 person difference

[35] City of Key West

The Wastewater Treatment Plant provides secondary treatment and originally discharged into Hawks Channel and the Atlantic Ocean. The ocean outfall was only projected to be in use for only 2-5 years until the deep well injection facility was completed.

In 1993, the City's Wastewater collection and transmission system consisted of approximately 295,000 linear feet of gravity and pressure sewer pipe ranging in diameter from 8 to 30-inches. The collection system is divided into eight districts (A, B, C, D, DA, E F, G). However, the City's Comprehensive plan also identifies a District H, I J when identifying the pump station capacity by district.

Table 23
Wastewater Treatment Facilities and Capacity
City of Key West[36]
1989

Facility	Design Capacity (mgd)	Annual Average Flow (mgd)	Available Capacity (mgd)
City of Key West	10.0	5.82	2.78
Hampton Inn	0.03	0.028	0.002
Martha's Restaurant and Benihana's	0.017*	0.004	0
Key Ambassador Resort	0.020	0.009	0.001
Monroe County Offices	0.012	0.002	0.009
Gerald Adams Elementary	0.010	0.001	0.008
Florida Keys Comm. College	0.015	0.006	0.005
Florida Keys Memorial Hosp.	0.040	0.019	0.017
Key West Resort Utilities	0.250	0.160	0.035
Scotty's	0.0012	NA	NA

*Permitted flow 3,400 gpd due to drainfield size

Table 24
Wastewater Flow Projections[37]
City of Key West, 1991

Year	Population	Demand (mgd)
1990	18,652	4.73
1995	19,372	4.83
2000	20,119	4.93
2005	20,895	5.05
2010	21,701	5.16

[36] City of Key West
[37] City of Key West

Primary Canal Network as Community Assets

The region's drainage system is generally comprised of primary system of canals. Canals operated by the South Florida Water Management District (SFWMD), a secondary canal system operated by either each County, a municipality, a special taxing district, and a third system associated with streets, parking lots, storm sewers and on-site detention/retention systems. For the purposes of this study, only primary and secondary drainage systems will be inventoried and are generally depicted in the South Florida Regional Planning Council Map series.

The SFWMD operates and maintains the primary canal system and establishes discharge limits for releases into the secondary canal system. Limitations on discharge are determined by the capacity of the receiving primary canal to accept and safely remove storm water.

In addition to providing drainage, some of these primary canals also provide recreational opportunities or have been identified as community assets for community redevelopment.

Cutler Ridge Mall
Downtown Kendall
North Miami Beach
Miami Shores/El Portal
Miami River
Oakland Park (North Fork New River)
Ojus
Lauderdale Lakes

As community assets, more and more community redevelopment plans will identify opportunities to turn canal front properties into community assets. Instead of being a utility that runs through or divides a community, new redevelopment opportunities will look toward transforming these canals into promenades, linear parks, bikeways, waterfront residential or mixed-use developments. In some community redevelopment plans, ornamental bridges and pedestrian crossings are also envisioned. The District must make every attempt to work with communities along its canals to ensure that redevelopment can be accommodated without reducing the maintenance access and conveyance.

One major objective of the South Florida Water, Wastewater and Stormwater Facilities Study is to strengthen coordination of water supply planning and development activities. This coordination is linked through each local comprehensive plan. Currently, each local government within the region is beginning to conduct updates to their plan through the Evaluation and Appraisal Report (EAR) process. Local Government Comprehensive Plans and subsequent EAR's are to be based upon "best available data". A standardized data source for public facilities will provide a consistent and uniform means to conduct meaningful updates to the comprehensive plans. Currently, the South Florida Regional Planning Council has requested and received the authority by the Department of Community Affairs to review local government comprehensive EAR. The EAR delegation agreement is attached. This agreement will help to provide assurances to the District that water supply planning and development activity within the region is linked.

Review of existing adopted Comprehensive Plans for each County and major city indicates that data for drainage is routinely limited to the identification of primary facilities. Secondary

systems are not identified. Review of Section 163.3177(6)(f) F.S. and 9J-5.011(1) F.A.C. reveals that no specific level of data is required to be provided; therefore, there is no uniform report of the data. Clarification of the rule may be recommended.

Consistency With Lower East Coast Water Supply Plan

The Lower East Coast Water Supply Plan provides an implementation strategy to ensure that water supplies are available to meet the demands of the natural system, agricultural uses, and urban development through the year 2020. This study will augment the Lower East Coast Water Supply Plan by ensuring the local government growth plans utilize consistent data and projections for water supply planning.

The study area for this study includes a portion of Lower East Coast Study Area and all of Lower East Coast Study Areas 2, 3. A portion of northern Broward County falls within Lower East Coast Service Area 1 and includes a portion of Broward County Drainage District 2A, Deerfield Beach, the North Springs Improvement District, and Parkland. Lower East Coast Study Area 2 includes
most of Broward County and Lower East Coast Study Area 3 includes most of Miami-Dade County.

The Lower East Coast Study includes 46 recommendations with several of the recommendations specific to improvements within Study Areas 1, 2 and 3. These recommendations will be considered in future Tasks of this study and can be reviewed for integration into local government capital improvement plans as part of the EAR and EAR amendments. The Lower East Coast Study also identifies the following Water and Wastewater facility capacities.

The Lower East Coast Regional Supply Plan identifies the following potable water treatment capacities in 1995 (Table 25).

Table 25
Potable Water Utilities[38]
1995 mgd

Miami Sewer and Water Department	168.2
Miami Sewer and Water Department	166.8
City of Fort Lauderdale	48.7
City of Hollywood	19.3
City of Sunrise	18.1
City of Pompano Beach	16.23
City of North Miami Beach	NA
City of Plantation	13.9
Florida Keys Aqueduct Authority	14.08
City of Pembroke Pines	9.33
City of Homestead	6.47
City of Deerfield Beach	11.3
Broward County	14.55

[38] Source: SFWMD

The Lower East Coast Regional Supply Plan identifies the following wastewater treatment capacities in 1995 (Table 26).

Table 26
Wastewater Utilities
Capacity (mgd)

Broward North Regional	80.0
City of Hollywood	42.0
City of Sunrise	.99
Plantation Regional	15.00
Pompano Beach	2.50
Homestead	2.25
Krome Service Center	2.25
Miami-Dade Southern District	88.73
Miami-Dade Central District	150.84
Miami-Dade Northern District	116.94
Duck Key	.10
Key West Resort Utility	.50

Source: SFWMD

Task 1B

Population Projections for South Florida

The Miami-Dade, Broward and Monroe County Comprehensive plans do not currently provide population projections beyond the year 2010. As depicted in Table 27, population projections used for planning purposes can vary.

Developing population projections for a region that grows as fast as South Florida is a challenge. The region that includes Monroe, Miami-Dade and Broward Counties has added between 560 and 770 thousand new residents each decade since 1950. Official projections published by the University of Florida's Bureau of Economic and Business Research (BEBR) suggest that the region will continue to grow by approximately 600 thousand new residents in each of the next three decades (Table 28).

Although no official projections are available beyond 2030, a recent study prepared as part of the update of the Comprehensive Everglades Restoration Plan (CERP) projected that population growth during the following two decades (2030-2050) would be greater than half a million in each decade, bringing regional population from just under 4 million in 2000 to 6.8 million fifty years later, an increase of over 70%.

In planning for future infrastructure needs in a region this large, the location of growth within the region and within the three counties is almost important as the amount of growth. Today, there is no single source of population projections for the region as a whole that includes sub-county geography. Each of the county planning departments prepares estimates and projections that are used for local planning purposes. The methodology used in each county is different, but they all have in common an increasing use of the analysis of available land to determine where future population growth will be located within the county. Both Miami-Dade County and Broward County produce projections for Traffic Analysis Zones (TAZs) that are consistent with their countywide totals. These, in turn, can be aggregated to enable census tract and municipal totals for planning purposes.

Monroe County is engaged in discussions with regard to implementation of the Florida Keys Carrying Capacity Study, which will have a significant impact on the amount of population growth that will take place in the Florida Keys in the coming decades. Although those discussions have not been finalized at this time, it is safe to say that the amount of growth will be small when compared to the projected growth in Miami-Dade and Broward Counties. Especially important for the estimation of the need for capital facilities in Monroe County are projections of the seasonal population, which includes tourists, "day-trippers" and part-time residents. Monroe County indicates that it is updating its population projections at this time to take into account the results of the 2000 Census.

As might be expected, county projections are not always consistent with the official projections published by BEBR. However, the current differences are not large, as can be seen in Table 1. It is important to note that the counties coordinate with the local school boards and Metropolitan Planning Organizations to ensure consistency in the population base used to determine need for school and transportation services.

Finally, please note that the South Florida Regional Planning Council (SFRPC) and the Treasure Coast Regional Planning Council (TCRPC) have created a partnership to acquire and use a regional economic forecasting model. Implementation of the forecasting model will require the

development of basic assumptions about population growth over a planning horizon of at least 20 years. We plan to convene the partnership before the end of 2003 to begin these discussions.

At this time, the best available countywide projections for the required 50-year horizon are those presented in the US Army Corps of Engineers report "Municipal and Industrial (M&I) Water use Forecast, Initial Comprehensive Everglades Restoration Plan (CERP) Update" (August 2003). Since these are not available for sub-county geography, the SFRPC will work with the counties, in coordination with the economic forecasting effort, to develop a set of sub-county projections for the planning horizon.

Table 28
Comparison of
Reported Resident Population Estimates for
South Florida Region

Source	2000	2005	2010
Miami-Dade Comp Plan, 1988	1,943,400	2,183,267	2,536,494
Miami-Dade EAR Report, 1996	2,102,000	NA	2,331,000
Miami-Dade Water and Sewer, 2002	2,253,485	NA	NA
Broward County Comp Plan, 1989	1,475,248	NA	1,606,013
Monroe County Comp Plan, 1997	89,800	NA	99,600

Table 27
South Florida Water, Wastewater and Drainage Study
Demographic Baseline

Source	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
USACE, Municipal and Industrial (M&I) Water Use Forecast, Initial Comprehensive Everglades Restoration Plan (CERP) Update (August 2003)											
Broward	1,623,018	1,772,800	1,931,600	2,092,300	2,257,100	2,416,900	2,562,900	2,658,825	2,754,751	2,850,884	2,947,017
Miami-Dade	2,253,362	2,403,200	2,554,300	2,706,500	2,862,000	3,011,900	3,148,100	3,323,653	3,499,205	3,654,920	3,810,635
Monroe	79,589	81,300	82,200	83,100	84,100	85,000	85,800	86,700	87,600	88,500	89,400
Regional Total	3,955,969	4,257,300	4,568,100	4,881,900	5,203,200	5,513,800	5,796,800	6,069,178	6,341,556	6,594,304	6,847,052
University of Florida, Bureau of Economic and Business Research (May 2001)											
Broward	1,623,018	1,785,700	1,949,400	2,117,300	2,289,900	2,458,200	2,612,700				
Miami-Dade	2,253,362	2,405,100	2,557,100	2,712,100	2,870,600	3,024,200	3,164,300				
Monroe	79,589	80,300	81,100	81,800	82,600	83,300	84,000				
Regional Total	3,955,969	4,271,100	4,587,600	4,911,200	5,243,100	5,565,700	5,861,000	0	0	0	0
Broward County (2003)	1,623,018	1,789,916	1,954,572	2,117,038	2,273,287	2,418,641	2,548,303				
Miami-Dade County (2001)	2,253,362	2,402,105	2,551,284	2,703,114	2,858,185	3,019,785					
Monroe County (1999)	85,622	88,305	90,236	90,654							

Appendix B

Survey and Survey Results

Appendix C

Additional Monroe County Wastewater Treatment Facility Information

City of Key West

The sewer treatment plant and sewer collection system operation and maintenance is contracted to Operations Management International, Inc. (OMI). OMI employs 25 people at its Key West facility. Wastewater is treated and pumped into the ocean through an outfall. The new treatment plant was constructed in 1989 and was designed and permitted to process sewage at a rate of 10 million gallons per day (MGD).

Currently, average flows are approximately 4 MGD, a reduction from 8 MGD two years ago. This reduction in flow indicates the success of the $56 million collection system rehabilitation. Seawater inflow that previously entered the system and had to be unnecessarily pumped to the plant no longer occurs.

The City has spent more than $67 million over the past 3 years on sewer capital improvements to rebuild the collection system, replace the ocean outfall with a Class I Deep Injection Well, and upgrade the current Sewer Treatment Plant to an Advanced Wastewater Treatment (AWT) facility.

Key Colony Beach

There is no information available on the wastewater treatment facilities located in Key Colony Beach.

Islamorada: Village of Islands

Treatment and disposal of wastewater in the Village is performed by residential and business owners through privately owned, operated and maintained wastewater systems. There are no public wastewater treatment facilities operating in the Village. The wastewater facilities in the Village consist of on-site wastewater disposal and treatment systems (OSTDS) that are permitted by the State of Florida Department of Health (DOH), including substandard septic systems, and "package" or "pre-engineered" wastewater treatment plants permitted by the DEP. There are also cesspools and other undocumented systems scattered throughout the Village. Table 1-7 provides a breakdown of the inventory of existing wastewater facilities within the Village.

TABLE 1-7: BREAKDOWN OF EXISTING WASTEWATER FACILITIES

Key	# of Unknown Systems	Est. # of Cesspools	Found Cesspools	Est. Substandard Septic Systems	# of Permitted (ATU) Septic Systems	# of Permitted WW Facilities
Plantation Key	559	176	22	117	10 new permits	23
Windley Key	4	0	1	4	--	8
Upper Matecumbe Key	213	41	21	40	6 new permits	30
Lower Matecumbe Keys	183	20	15	27	4 new permits	6

Source: Islamorada: Village of Islands Comprehensive Plan, Chapter 4 D.I.A.

Approximately 60 percent of the wastewater flow is treated by OSTDS. One and two-family dwellings commonly use septic tanks, and currently many campgrounds and mobile home parks in the County are also serviced by either septic tanks or package plants. The HRS is the entity responsible for the issuance of permits for on-site disposal systems.

Private package treatment plants treat approximately 35 percent of the wastewater flow and about 5 percent is conveyed into cesspools. All of the package plants serve site-specific purposes and are privately owned, operated and maintained. As of 1999, there were 66 DEP permitted wastewater treatment facilities within Islamorada. The total capacity of these facilities is 1.0304 mgd. Table 1-8 shows permitted capacity values for package treatment plants within the Village's jurisdiction.

Factors such as rapid growth and the reliance upon private enterprise for the construction and operation of wastewater treatment facilities has caused a proliferation of small package treatment plants and an enormous inventory of individual septic tanks.

Table 1-8

	FACILITY	ADDRESS	CAPACITY, MGD
1	Boy Scouts Sea Base	73800 Overseas Highway	0.025
2	Caloosa Cove	73801 Overseas Highway	0.025
3	Sandy Point Condo	108 Costa Brava Drive	0.0033
4	Captain's Cove Condo	Gulf View Drive	0.015 (not in service)
5	Matecumbe Resort	76261 Overseas Highway	0.01
6	White Gate Court	78 MM, Bay	UIC
7	Papa Joe's Restaurant	79.7 MM, Bay	0.005
8	Lazy Days	79867 Overseas Highway	0.0095
9	Palms of Islamorada	79901 Overseas Highway	0.02
10	Hampton Inn	80 MM, Ocean	0.025
11	Breezy Palms Resort	80.1 MM, Ocean	0.015
12	La Siesta Resort	80.4 MM, Ocean	0.0125 (with reuse)
13	Sand Pebbles Condo	80450 Overseas Highway	0.015
14	Maison Matecumbe	80639 Overseas Highway	0.0095
15	Uncle's Restaurant	80939 Overseas Highway	0.015
16	Tarpon Flats	81 MM, Bay	0.006
17	Dino's Restaurant	81031 Overseas Highway	0,0075
18	Wet Net Club	81101 SR 4A	0.0075 (not built)
19	Green Turtle Inn	81 MM, Ocean	0.01
20	Worldwide Sportsman	81576 Overseas Highway	0.02 (to be upgraded)
21	Mexican Cantina (Time Out BBQ)	81.5 MM, Ocean	0.005
22	Morada Bay	81.5 MM, Bay	0.015
23	Islamorada Bakery	81620 Overseas Highway	0.009
24	Squid Row	81901 Overseas Highway	0.009
25	Woody's	81.9 MM, Bay	0.0033
26	Lorelei	Madeira Road	0.0075
27	Islamorada Professional Bldg.	81990 Overseas Highway	UIC
28	Cheeca Lodge	82 MM, Ocean	0.07 (with reuse)
29	Pelican Palms Trailer Park	82.7 MM, Ocean	0.0075
30	Theater of the Sea	82.7 MM, Ocean	UIC
31	Sunset Inn	82200 Overseas Highway	0.03

	FACILITY	ADDRESS	CAPACITY, MGD
32	The Beach House	82748 Overseas Highway	0.01
33	Days Inn	82749 Overseas Highway	0.0083
34	Bentley's Restaurant	82779 Overseas Highway	0.004
35	Coral Grill	83.5 MM, Bay	0.018
36	Whale Harbor Inn	83.7 MM, Ocean	0.04
37	Beacon Reef Condo	83201 Overseas Highway	0.025
38	Chesapeake Resort	83409 Overseas Highway	0.0075
39	Holiday Isle	84 MM, Ocean	0.04
40	Howard Johnson's	84 MM, Ocean	0.03
41	Pelican Cove	84457 Old Highway	0.015
42	Harbor Lights	84951 Overseas Highway	0.02
43	Windley Key Trailer Park	84961 Overseas Highway	0.0075
44	Tropical Reef Resort	84977 Overseas Highway	0.02
45	Smuggler's Cove	85.5 MM, Bay	0.009
46	Hawk Channel Bar & Grille	85.5 MM, Ocean	0.015
47	Careless Navigator	85361 Overseas Highway	0.009
48	USCG Station	183 Palermo Drive	0.005
49	Pelican Plaza / Jammers	86701 Overseas Highway	0.015
50	Executive Bay Club	87 MM, Bay	0.05
51	Seabreeze Trailer Park	87.2 MM, Ocean	0.0075 (to be upgraded)
52	Plantation Yacht Harbor	87000 Overseas Highway	0.035
53	Plantation by the Sea	87465 SR 4A	0.02
54	Ocean Harbour	87851 SR 905	0.024
55	Marker 88	88 MM, Bay	0.015
56	Coral Harbour	88181 Old Highway	0.015
57	Summer Sea Condo	8850 Overseas Highway	0.026
58	Indian Waterways	89240 Overseas Highway	UIC
59	Plantation Key Gov. Ctr.	2 High Point Road	0.01
60	Old Mariner's Hospital	50 High Point Road	0.04
61	Plantation Key Elementary	100 Lake Street	0.02
62	Coral Shores High School	90 MM, Ocean	0.015
63	Sea Gulls Condo	100 Wrenn Street	0.0175
64	Turek Building	90.5 MM, Bay	0.005
65	Tavenier Harbor	90311 Overseas Highway	0.015
66	Tropic Vista Motel/Tropical Café	90701 Overseas Highway	0.005

Source: Florida Department of Environmental Protection, Marathon 1999
UIC = Underground injection control

City of Marathon

Treatment and disposal of wastewater in the City of Marathon is performed by residential and business owners through privately owned, operated and maintained wastewater systems. The wastewater facilities in the City consist of on-site wastewater disposal and treatment systems that are permitted by the State of Florida Department of Health (DOH), including substandard septic systems, and "package" or "pre-engineered" wastewater treatment plants permitted by the DEP. There is also property that has been determined to have cesspools or undocumented systems.

As of February 1998 there were 65 active Florida Department of Environmental Protection (DEP) permitted wastewater treatment plants with the prescribed Marathon area, with capacities ranging from 0.0025 million gallons per day (mgd) to 0.22 mgd. According to the FDOH there are 1,081 FDOH permitted septic tanks within the Marathon area. Wastewater flows that are not treated by FDEP permitted treatment plants or FDOH permitted septic tanks are discharged to unpermitted septic systems or cesspits. Based on aerial photographs of the Marathon area, there are 4,500 developed lots that utilize on-site wastewater treatment systems, which indicates that as many as 3,400 lots may be using unpermitted facilities.

Table 1-9

Breakdown Of Existing Wastewater Facilities

Single Family Septic	Multi-Family Septic Systems	# of Commercial Permitted Septic Systems	# of Permitted Wastewater Package Plants
3431	1083	1081	71

Source: City of Marathon Comprehensive Plan

According to the Water Quality Protection Plan (WQPP) Phase II Report for the Florida Keys National Marine Sanctuary, it is estimated that 24 percent of wastewater treatment is handled by wastewater treatment plants, 63 percent by septic tanks, and 13 percent by cesspits.[39]

In addition to the 65 active wastewater treatment plants in the Marathon area, it is reported that there are 2 inactive plants, 1 plant that is being re-permitted and reconstructed, and 3 plants that hold permits, but are not yet constructed.[40]

The total permitted capacity of the 71 plants is 1.43 mgd. Of the 71 plants, 20[41] have capacities of 0.02 mgd or greater and have a combined capacity of 1.01, which is 71 percent of the total wastewater treatment plant capacity in the Marathon area. The remaining 51 plants have a total capacity of 0.42 mgd. Please see the Table 1-10 for a list of all the facilities located in the Marathon area, their permitted capacities and average daily flow. Map 1-19 shows the location of each facility listed below.

Table 1-10

Fac. Plan Map #	Facility Name	Permitted Capacity (mgd)	Average Daily Flow (mgd)	Excess Capacity (mgd)[1]	Available Excess Capacity (mgd)
1	Bonefish Tower	0.05	0.01	0.03	0.0175
3	Boot Key Marina	0.04	0.006	0.031	0.021
4	Buccaneer Lodge	0.03	0.012	0.013	0.0055
5	Eastwind Apts.	0.06	0.016	0.014	0.026
6	Fisherman's Hospital	0.021	0.011	0.009	0.0038
7	Galway Bay MHP	0.038	0.015	0.014	0
8	Guidance Clinic	0.02	0.006	0.011	0.006

[39] Pg. 4-2
[40] Pg. 4-2
[41] 2 of the 20 plants have not yet been constructed.

Fac. Plan Map #	Facility Name	Permitted Capacity (mgd)	Average Daily Flow (mgd)	Excess Capacity (mgd)[1]	Available Excess Capacity (mgd)
9	Hall's Resort[2]	0.02	n/a	n/a	n/a
10	Harborside @ Marathon[2]	0.06	n/a	n/a	n/a
11	Hawk's Cay Resort[3]	0.196	0.058	0.126	0.077
12	Holiday Inn/Marathon	0.035	0.021	0.0	0.0225
13	Howard Johnson's	0.025	0.026	0.0	0.0
14	Jolly Roger Travel Park	0.03	0.012	0.014	0.0065
15	Key Colony Beach	0.22	0.184	0.0	0.0
16	Key Lime Resort	0.025	0.011	0.011	0.0048
17	Marathon Key Beach Club	0.03	0.012	0.014	0.0065
18	Marathon Trailerama	0.02	0.0094	0.008	0.003
71	Publix[4]	0.03	0.0034	0.026	0.0185
19	Seawatch Condo	0.04	0.004	0.0337	0.0237
20	Sombrero Resort	0.02	0.007	0.0097	0.0047
21	Captain's Quarters Condo	0.003	0.0017	0.0	0.0
22	Casa Cayo Condo	0.0032	0.0009	0.0012	0.0004
23	Cobia Point Condo	0.0042	0.0016	0.0009	0
24	Coco Plum Beach Apt.s	0.0083	0.0024	0.0023	0.0002
25	Coral Club Condo	0.005	0.0014	0.0027	0.0015
26	Coral Lagoon Resort	0.0088	0.0039	0.0005	0.0
27	Dockside Lounge	0.0035	0.0036	0.0	0.0
28	Faro Blanco Resort	0.01	0.0041	0.004	0.0015
29	Gator's Restaurant (T&W Seafood)	0.0075	0.001	0.0045	0.0026
30	Gulfside Village	0.008	0.0028	0.002	0.0
31	Harbor Club South Condo	0.01	0.0012	0.008	0.0055
32	Harbor House Condo	0.005	0.0015	0.0017	0.0005
33	Hawk's Nest	0.01	0.0028	0.0057	0.0032
2	Home Depot	0.01	n/a	n/a	n/a
34	Hurricane/Econo (Blackfin)	0.008	0.0038	0.002	0.0
35	Int'l House of Pancakes	0.0097	0.0029	0.006	0.0
36	Island Club Condo	0.008	0.0017	0.005	0.003
37	Key RV Park	0.015	0.0064	0.004	0.0003
38	Kingsail Resort	0.0033	0.0018	0.0003	0.0
39	K Mart Plaza	0.015	0.0086	0.002	0.0
40	Lady Alexander Condo	0.005	0.0008	0.0033	0.0021
41	Lucy Apartments	0.003	0.0022	0.0	0.0
42	Leigh-de Sanctis (Tropic Isles)[5]	0.01	0.0014	0.0082	0.0057
43	Marathon Airport	0.0075	0.001	0.0065	0.0046
44	Marathon Country Club	0.008	0.0026	0.0047	0.0
45	Marathon High School	0.015	0.0035	0.007	0.0033
46	Marathon Manor	0.015	0.001	0.0017	0.0

Fac. Plan Map #	Facility Name	Permitted Capacity (mgd)	Average Daily Flow (mgd)	Excess Capacity (mgd)[1]	Available Excess Capacity (mgd)
47	Marathon Marina[2]	0.01	n/a	n/a	n/a
48	Marie's Yacht Harbor Club	0.009	0.0007	0.008	0.0058
49	Mid-Town Trailer Park	0.0075	0.0026	0.0028	0.0009
50	Monroe Reg. Service Center	0.01	0.0024	n/a	n/a
51	Panda House Restaurant	0.005	0.0012	0.003	0.0018
52	Pelican Motel and Trailer Park	0.015	0.0014	0.012	0.0083
53	Perry's Restaurant[6]	0.004	0.002	0.001	0.0
54	Pizza Hut	0.008	0.0011	0.006	0.004
55	Quay Restaurant	0.015	0.004	0.01	0.0063
56	Royal Plum Condo	0.01	0.004	0.002	0.0
57	Schooner Condo	0.005	0.0028	0.0	0.0
58	Seahorse Motel	0.0075	0.0017	0.0052	0.0033
59	Sombrero Beach Village	0.005	0.0018	0.002	0.0008
60	Sombrero Country Club	0.01	0.0036	0.004	0.0015
61	Sombrero Ridge Condo	0.0048	0.001	0.0028	0.0016
62	Spanish Galleon	0.005	0.0029	0.001	0.0
63	Stanley Switlik Elementary	0.015	0.004	0.008	0.0043
64	The Reef	0.017	0.0056	0.0097	0.0055
65	The Rock (Gulfshore) Apts.	0.0075	0.002	0.0048	0.0029
66	Tradewinds West	0.0064	0.0013	0.0044	0.0028
67	Treasure Cay Condo	0.005	0.001	0.003	0.0018
68	U.S. Coast Guard Station	0.0025	0.002	0.0	0.0
69	Wendy's	0.004	0.0022	0.0013	0.0003
70	Winn Dixie Plaza	0.0085	0.0048	0.0015	0.0
	TOTALS	**1.4257**	**0.5465**	**0.5411**	**0.3333**

[1] Excess Capacity = (Permitted Capacity) – (Max. 3-month Avg. Daily Flow)
[2] Facility has not yet been constructed
[3] A 0.096 mgd expansion of this facility was completed in January 1998
[4] Flows indicated for this new facility are based on DMRs from July 1998 to November 1998
[5] Flows indicated for this new facility are based on DMRs from April 1998 to November 1998
[6] Facility was inactive in February 1998

Hold for Map 1-19, locations of Marathon WW treatment plants

Appendix D

Basin Land Use data and runoff calculations

Appendix E

Statutory Financing Mechanisms

Section 130.01 Purposes for which county bonds may issue -- Whenever the board of county commissioners of any county shall deem it expedient, or to the best interests of such county, to issue the county bonds of their county, for the purpose of constructing paved, macadamized, or other hard-surfaced highways, or erecting a courthouse or jail, or other public buildings, and funding the outstanding indebtedness of the county, or for any of such purposes, they shall determine by resolution to be entered in their records, what amount of bonds is required for such purpose, the rate of interest to be paid thereon, and the time when the principal and interest of such bonds shall be due and when payable.

Section 166.111 Authority to borrow -- The governing body of every municipality may borrow money, contract loans, and issue bonds as defined in s. 166.101 from time to time to finance the undertaking of any capital or other project for the purposes permitted by the State Constitution and may pledge the funds, credit, property, and taxing power of the municipality for the payment of such debts and bonds.

Section 166.101 Definitions --As used in this part, the following words and terms shall have the following meanings unless some other meaning is plainly indicated:

(1) The term "bond" includes bonds, debentures, notes, certificates of indebtedness, mortgage certificates, or other obligations or evidences of indebtedness of any type or character.

(2) The term "general obligation bonds" means bonds which are secured by, or provide for their payment by, the pledge, in addition to those special taxes levied for their discharge and such other sources as may be provided for their payment or pledged as security under the ordinance or resolution authorizing their issuance, of the full faith and credit and taxing power of the municipality and for payment of which recourse may be had against the general fund of the municipality.

(3) The term "ad valorem bonds" means bonds which are payable from the proceeds of ad valorem taxes levied on real and tangible personal property.

(4) The term "revenue bonds" means obligations of the municipality which are payable from revenues derived from sources other than ad valorem taxes on real or tangible personal property and which do not pledge the property, credit, or general tax revenue of the municipality.

(5) The term "improvement bonds" means special obligations of the municipality which are payable solely from the proceeds of the special assessments levied for an assessable project.

(6) The term "refunding bonds" means bonds issued to refinance outstanding bonds of any type and the interest and redemption premium thereon. Refunding bonds shall be issuable and payable in the same manner as the refinanced bonds, except that no approval by the electorate shall be required unless required by the State Constitution.

(7) The term "governing body" means the council, commission, or other board or body in which the general legislative powers of the municipality shall be vested.

(8) The term "project" means a governmental undertaking approved by the governing body and includes all property rights, easements, and franchises relating thereto and deemed necessary or convenient for the construction, acquisition or operation thereof, and embraces any capital expenditure which the governing body of the municipality shall deem to be made for a public

purpose including the refunding of any bonded indebtedness which may be outstanding on any existing project which is to be improved by means of a new project.

Section 190.012 Special powers; public improvements and community facilities -- The district shall have, and the board may exercise, subject to the regulatory jurisdiction and permitting authority of all applicable governmental bodies, agencies, and special districts having authority with respect to any area included therein, any or all of the following special powers relating to public improvements and community facilities authorized by this act:

(1) To finance, fund, plan, establish, acquire, construct or reconstruct, enlarge or extend, equip, operate, and maintain systems, facilities, and basic infrastructures for the following:

(a) Water management and control for the lands within the district and to connect some or any of such facilities with roads and bridges.

(b) Water supply, sewer, and wastewater management, reclamation, and reuse or any combination thereof, and to construct and operate connecting intercepting or outlet sewers and sewer mains and pipes and water mains, conduits, or pipelines in, along, and under any street, alley, highway, or other public place or ways, and to dispose of any effluent, residue, or other byproducts of such system or sewer system.

(c) Bridges or culverts that may be needed across any drain, ditch, canal, floodway, holding basin, excavation, public highway, tract, grade, fill, or cut and roadways over levees and embankments, and to construct any and all of such works and improvements across, through, or over any public right-of-way, highway, grade, fill, or cut.

(d) 1. District roads equal to or exceeding the specifications of the county in which such district roads are located, and streetlights.

2. Buses, trolleys, transit shelters, ridesharing facilities and services, parking improvements, and related signage.

(e) Investigation and remediation costs associated with the cleanup of actual or perceived environmental contamination within the district under the supervision or direction of a competent governmental authority unless the covered costs benefit any person who is a landowner within the district and who caused or contributed to the contamination.

(f) Conservation areas, mitigation areas, and wildlife habitat, including the maintenance of any plant or animal species, and any related interest in real or personal property.

(g) Any other project within or without the boundaries of a district when a local government issued a development order pursuant to s. 380.06 or s. 380.061 approving or expressly requiring the construction or funding of the project by the district, or when the project is the subject of an agreement between the district and a governmental entity and is consistent with the local government comprehensive plan of the local government within which the project is to be located.

(2) After the board has obtained the consent of the local general-purpose government within the jurisdiction of which a power specified in this subsection is to be exercised, to plan, establish, acquire, construct or reconstruct, enlarge or extend, equip, operate, and maintain additional systems and facilities for:

(a) Parks and facilities for indoor and outdoor recreational, cultural, and educational uses.

(b) Fire prevention and control, including fire stations, water mains and plugs, fire trucks, and other vehicles and equipment.

(c) School buildings and related structures, which may be leased, sold, or donated to the school district, for use in the educational system when authorized by the district school board.

(d) Security, including, but not limited to, guardhouses, fences and gates, electronic intrusion-detection systems, and patrol cars, when authorized by proper governmental agencies; except that the district may not exercise any police power, but may contract with the appropriate local general-purpose government agencies for an increased level of such services within the district boundaries.

(e) Control and elimination of mosquitoes and other arthropods of public health importance.

(f) Waste collection and disposal.

(3) To adopt and enforce appropriate rules following the procedures of chapter 120, in connection with the provision of one or more services through its systems and facilities.

(4) (a) To adopt rules necessary for the district to enforce certain deed restrictions pertaining to the use and operation of real property within the district. For the purpose of this subsection, "deed restrictions" are those covenants, conditions, and restrictions contained in any applicable declarations of covenants and restrictions that govern the use and operation of real property within the district and, for which covenants, conditions, and restrictions, there is no homeowners' association or property owner's association having respective enforcement powers. The district may adopt by rule all or certain portions of the deed restrictions that:

1. Relate to limitations or prohibitions that apply only to external structures and are deemed by the district to be generally beneficial for the district's landowners and for which enforcement by the district is appropriate, as determined by the district's board of supervisors; or

2. Are consistent with the requirements of a development order or regulatory agency permit.

(b) The board may vote to adopt such rules only when all of the following conditions exist:

1. The district's geographic area contains no homeowners' associations as defined in s. 720.301(9);

2. The district was in existence on the effective date of this subsection, or is located within a development that consists of multiple developments of regional impact and a Florida Quality Development;

3. The majority of the board has been elected by qualified electors pursuant to the provisions of s. 190.006; and

4. The declarant in any applicable declarations of covenants and restrictions has provided the board with a written agreement that such rules may be adopted. A memorandum of the agreement shall be recorded in the public records.

(c) Within 60 days after such rules take effect, the district shall record a notice of rule adoption stating generally what rules were adopted and where a copy of the rules may be obtained. Districts may impose fines for violations of such rules and enforce such rules and fines in circuit court through injunctive relief.

Chapter 163, PART III- COMMUNITY REDEVELOPMENT

163.330 Short title, 163.335 Findings and declarations of necessity, 163.336 Coastal resort area redevelopment pilot project, 163.340 Definitions, 163.345 Encouragement of private enterprise, 163.346 Notice to taxing authorities, 163.350 Workable program, 163.353 Power of taxing authority to tax or appropriate funds to a redevelopment trust fund in order to preserve and enhance the tax base of the authority, 163.355 Finding of necessity by county or municipality, 163.356 Creation of community redevelopment agency, 163.357 Governing body as the community redevelopment agency, 163.358 Exercise of powers in carrying out community redevelopment and related activities, 163.360 Community redevelopment plans, 163.361 Modification of community redevelopment plans, 163.362 Contents of community redevelopment plan, 163.365 Neighborhood and community wide plans, 163.367 Public officials, commissioners, and employees subject to code of ethics, 163.370 Powers; counties and municipalities; community redevelopment agencies, 163.375 Eminent domain, 163.380 Disposal of property in community redevelopment area, 163.385 Issuance of revenue bonds, 163.387 Redevelopment trust fund, 163.390 Bonds as legal investments, 163.395 Property exempt from taxes and from levy and sale by virtue of an execution, 163.400 Cooperation by public bodies, 163.405 Title of purchaser, 163.410 Exercise of powers in counties with home rule charters, 163.415 Exercise of powers in counties without home rule charters, 163.430 Powers supplemental to existing community redevelopment powers, 163.445 Assistance to community redevelopment by state agencies, 163.450 Municipal and county participation in neighborhood development programs under Pub. L. No. 90-448, 163.455 Community-Based Development Organization Assistance Act; short title, 163.456 Legislative findings and intent, 163.457 Eligibility for assistance, 163.458 Three-tiered plan, 163.459 Eligible activities, 163.460 Application requirements, 163.461 Reporting and evaluation requirements, 163.462 Rulemaking authority, 163.463 Applicability of ch. 2002-294.

Section 218.62 Distribution formulas.—

(1) Each participating county and municipal government shall receive a proportion of moneys earmarked for distribution within that county.

(2) The proportion for each county government shall be computed by dividing the sum of the unincorporated area population plus two-thirds of the incorporated area population by the sum of the total county population plus two-thirds of the incorporated area population.

(3) The proportion for each municipal government shall be computed by dividing the population of that municipality by the sum of the total county population plus two-thirds of the incorporated area population.

(4) Effective October 1, 2000, the apportionment factors shall, except in the case of error in the population certified pursuant to s. 186.901, remain in effect for the fiscal year. Adjustments to distributions to correct errors shall be made subsequent to receipt of a corrected population certified pursuant to s. 186.901.

Section 336.025 County transportation system; levy of local option fuel tax on motor fuel and diesel fuel--

(1)(a) In addition to other taxes allowed by law, there may be levied as provided in ss. 206.41(1)(e) and 206.87(1)(c) a 1-cent, 2-cent, 3-cent, 4-cent, 5-cent, or 6-cent local option fuel tax upon every gallon of motor fuel and diesel fuel sold in a county and taxed under the provisions of part I or part II of chapter 206.

1. All impositions and rate changes of the tax shall be levied before July 1 to be effective January 1 of the following year for a period not to exceed 30 years, and the applicable method of distribution shall be established pursuant to subsection (3) or subsection (4). However, levies of the tax which were in effect on July 1, 2002, and which expire on August 31 of any year may be reimposed at the current authorized rate effective September 1 of the year of expiration. Upon expiration, the tax may be relevied provided that a redetermination of the method of distribution is made as provided in this section.

2. County and municipal governments shall utilize moneys received pursuant to this paragraph only for transportation expenditures.

3. Any tax levied pursuant to this paragraph may be extended on a majority vote of the governing body of the county. A redetermination of the method of distribution shall be established pursuant to subsection (3) or subsection (4), if, after July 1, 1986, the tax is extended or the tax rate changed, for the period of extension or for the additional tax.

Section 336.025 County transportation system; levy of local option fuel tax on motor fuel and diesel fuel

(1)(b) In addition to other taxes allowed by law, there may be levied as provided in s. 206.41(1)(e) a 1-cent, 2-cent, 3-cent, 4-cent, or 5-cent local option fuel tax upon every gallon of motor fuel sold in a county and taxed under the provisions of part I of chapter 206. The tax shall be levied by an ordinance adopted by a majority plus one vote of the membership of the governing body of the county or by referendum.

1. All impositions and rate changes of the tax shall be levied before July 1, to be effective January 1 of the following year. However, levies of the tax which were in effect on July 1, 2002, and which expire on August 31 of any year may be reimposed at the current authorized rate effective September 1 of the year of expiration.

2. The county may, prior to levy of the tax, establish by interlocal agreement with one or more municipalities located therein, representing a majority of the population of the incorporated area within the county, a distribution formula for dividing the entire proceeds of the tax among

county government and all eligible municipalities within the county. If no interlocal agreement is adopted before the effective date of the tax, tax revenues shall be distributed pursuant to the provisions of subsection (4). If no interlocal agreement exists, a new interlocal agreement may be established prior to June 1 of any year pursuant to this subparagraph. However, any interlocal agreement agreed to under this subparagraph after the initial levy of the tax or change in the tax rate authorized in this section shall under no circumstances materially or adversely affect the rights of holders of outstanding bonds which are backed by taxes authorized by this paragraph, and the amounts distributed to the county government and each municipality shall not be reduced below the amount necessary for the payment of principal and interest and reserves for principal and interest as required under the covenants of any bond resolution outstanding on the date of establishment of the new interlocal agreement.

3. County and municipal governments shall use moneys received pursuant to this paragraph for transportation expenditures needed to meet the requirements of the capital improvements element of an adopted comprehensive plan or for expenditures needed to meet immediate local transportation problems and for other transportation-related expenditures that are critical for building comprehensive roadway networks by local governments. For purposes of this paragraph, expenditures for the construction of new roads, the reconstruction or resurfacing of existing paved roads, or the paving of existing graded roads shall be deemed to increase capacity and such projects shall be included in the capital improvements element of an adopted comprehensive plan. Expenditures for purposes of this paragraph shall not include routine maintenance of roads.

Section 336.021 County transportation system; levy of ninth-cent fuel tax on motor fuel and diesel fuel--

(1)(a) Any county in the state, by extraordinary vote of the membership of its governing body or subject to a referendum, may levy the tax imposed by ss. 206.41(1)(d) and 206.87(1)(b). County and municipal governments may use the moneys received under this paragraph only for transportation expenditures as defined in s. 336.025(7).

(b) The governing body of the county may, by joint agreement with one or more of the municipalities located therein, provide for the transportation purposes authorized under paragraph (a) and the distribution of the proceeds of this tax within both the unincorporated and incorporated areas of the county. The provisions for refund provided in ss. 206.625 and 206.64 shall not be applicable to such tax levied by any county.

(c) Local option taxes collected on sales or use of diesel fuel in this state shall be distributed in the following manner:

1. The fiscal year of July 1, 1995, through June 30, 1996, shall be the base year for all distributions.

2. Each year the tax collected, less the service and administrative charges enumerated in s. 215.20 and the allowances allowed under s. 206.91, on the number of gallons reported, up to the total number of gallons reported in the base year, shall be distributed to each county using the distribution percentage calculated for the base year.

3. After the distribution of taxes pursuant to subparagraph 2., additional taxes available for distribution shall first be distributed pursuant to this subparagraph. A distribution shall be made to each county in which a qualified new retail station is located. A qualified new retail station is a retail station that began operation after June 30, 1996, and that has sales of diesel fuel exceeding

50 percent of the sales of diesel fuel reported in the county in which it is located during the 1995-1996 state fiscal year. The determination of whether a new retail station is qualified shall be based on the total gallons of diesel fuel sold at the station during each full month of operation during the 12-month period ending January 31, divided by the number of full months of operation during those 12 months, and the result multiplied by 12. The amount distributed pursuant to this subparagraph to each county in which a qualified new retail station is located shall equal the local option taxes due on the gallons of diesel fuel sold by the new retail station during the year ending January 31, less the service charges enumerated in s. 215.20 and the dealer allowance provided for by s. 206.91. Gallons of diesel fuel sold at the qualified new retail station shall be certified to the department by the county requesting the additional distribution by June 15, 1997, and by March 1 in each subsequent year. The certification shall include the beginning inventory, fuel purchases and sales, and the ending inventory for the new retail station for each month of operation during the year, the original purchase invoices for the period, and any other information the department deems reasonable and necessary to establish the certified gallons. The department may review and audit the retail dealer's records provided to a county to establish the gallons sold by the new retail station. Notwithstanding the provisions of this subparagraph, when more than one county qualifies for a distribution pursuant to this subparagraph and the requested distributions exceed the total taxes available for distribution, each county shall receive a prorated share of the moneys available for distribution.

4. After the distribution of taxes pursuant to subparagraph 3., all additional taxes available for distribution shall be distributed based on vehicular diesel fuel storage capacities in each county pursuant to this subparagraph. The total vehicular diesel fuel storage capacity shall be established for each fiscal year based on the registration of facilities with the Department of Environmental Protection as required by s. 376.303 for the following facility types: retail stations, fuel user/nonretail, state government, local government, and county government. Each county shall receive a share of the total taxes available for distribution pursuant to this subparagraph equal to a fraction, the numerator of which is the storage capacity located within the county for vehicular diesel fuel in the facility types listed in this subparagraph and the denominator of which is the total statewide storage capacity for vehicular diesel fuel in those facility types. The vehicular diesel fuel storage capacity for each county and facility type shall be that established by the Department of Environmental Protection by June 1, 1997, for the 1996-1997 fiscal year, and by January 31 for each succeeding fiscal year. The storage capacities so established shall be final. The storage capacity for any new retail station for which a county receives a distribution pursuant to subparagraph 3. shall not be included in the calculations pursuant to this subparagraph.

(d) The tax received by the department on motor fuel pursuant to this paragraph shall be distributed monthly by the department to the county reported by the terminal suppliers, wholesalers, and importers as the destination of the gallons distributed for retail sale or use. The tax on diesel fuel shall be distributed monthly by the department to each county as provided in paragraph (c).

(2)(a) The tax collected by the department pursuant to subsection (1) shall be transferred to the Ninth-cent Fuel Tax Trust Fund, which fund is created for distribution to the counties pursuant to paragraph (1)(d). The department shall deduct the administrative costs incurred by it in collecting, administering, enforcing, and distributing back to the counties the tax, which administrative costs may not exceed 2 percent of collections authorized by this section. The total administrative cost shall be prorated among those counties levying the tax according to the following formula, which shall be revised on July 1 of each year: Two-thirds of the amount deducted shall be based on the county's proportional share of the number of dealers who are registered for purposes of chapter 212 on June 30th of the preceding state fiscal year, and one-

third of the amount deducted shall be based on the county's share of the total amount of the tax collected during the preceding state fiscal year. The department has the authority to prescribe and publish all forms upon which reports shall be made to it and other forms and records deemed to be necessary for proper administration and collection of the tax levied by any county and shall adopt rules necessary to enforce this section, which rules shall have the full force and effect of law. The provisions of ss. 206.026, 206.027, 206.028, 206.051, 206.052, 206.054, 206.055, 206.06, 206.07, 206.075, 206.08, 206.09, 206.095, 206.10, 206.11, 206.12, 206.13, 206.14, 206.15, 206.16, 206.17, 206.175, 206.18, 206.199, 206.20, 206.204, 206.205, 206.21, 206.215, 206.22, 206.24, 206.27, 206.28, 206.41, 206.416, 206.44, 206.45, 206.48, 206.49, 206.56, 206.59, 206.626, 206.87, 206.872, 206.873, 206.8735, 206.874, 206.8741, 206.8745, 206.94, and 206.945 shall, as far as practicable, be applicable to the levy and collection of the tax imposed pursuant to this section as if fully set out in this section.

(b) The provisions of s. 206.43(7) shall apply to the incorrect reporting of the tax levied under this section.

(3) It is expressly recognized and declared by the Legislature that the establishment, operation, and maintenance of a transportation system and related facilities and the acquisition, construction, reconstruction, and maintenance of roads and streets fulfill a public purpose and that payment of the costs and expenses therefor may be made from county general funds, special taxing district funds, or such other funds as may be authorized by special or general law. Counties are authorized to expend the funds received under this section in conjunction with the state or federal government in joint projects.

(4)(a) A certified copy of the ordinance proposing to levy the tax pursuant to referendum shall be furnished by the county to the department within 10 days after approval of such ordinance. Furthermore, the county levying the tax pursuant to referendum shall notify the department within 10 days after the passage of the referendum of such passage and of the time period during which the tax will be levied. The failure to furnish the certified copy will not invalidate the passage of the ordinance.

(b) A county levying the tax pursuant to ordinance shall notify the department within 10 days after the governing body of the county adopts the ordinance and, at the same time, furnish the department with a certified copy of the ordinance.

(5) All impositions of the tax shall be levied before July 1 of each year to be effective January 1 of the following year. However, levies of the tax which were in effect on July 1, 2002, and which expire on August 31 of any year may be reimposed at the current authorized rate to be effective September 1 of the year of expiration. All impositions shall be required to end on December 31 of a year. A decision to rescind the tax shall not take effect on any date other than December 31 and shall require a minimum of 60 days' notice to the department of such decision.

(6) Notwithstanding any other provision of this section, the tax authorized pursuant to this section shall be levied in every county at the rate of 1 cent per gallon of diesel fuel beginning January 1, 1994.

Section 166.231 Municipalities; public service tax -- (1)(a) A municipality may levy a tax on the purchase of electricity, metered natural gas, liquefied petroleum gas either metered or bottled, manufactured gas either metered or bottled, and water service. Except for those municipalities in which paragraph (c) applies, the tax shall be levied only upon purchases within the municipality and shall not exceed 10 percent of the payments received by the seller of the taxable item from

the purchaser for the purchase of such service. Municipalities imposing a tax on the purchase of cable television service as of May 4, 1977, may continue to levy such tax to the extent necessary to meet all obligations to or for the benefit of holders of bonds or certificates which were issued prior to May 4, 1977. Purchase of electricity means the purchase of electric power by a person who will consume it within the municipality.

Section 166.231 Municipalities; public service tax - (1)(b) The tax imposed by paragraph (a) shall not be applied against any fuel adjustment charge, and such charge shall be separately stated on each bill. The term "fuel adjustment charge" means all increases in the cost of utility services to the ultimate consumer resulting from an increase in the cost of fuel to the utility subsequent to October 1, 1973.

Section 166.231 Municipalities; public service tax - (9) A purchaser who claims an exemption under subsection (4) or subsection (5) shall certify to the seller that he or she qualifies for the exemption, which certification may encompass all purchases after a specified date or other multiple purchases. A seller accepting the certification required by this subsection is relieved of the obligation to collect and remit tax; however, a governmental body that is exempt from the tax authorized by this section shall not be required to furnish such certification, and a seller is not required to collect tax from such an exempt governmental body.

Section 210.20 Employees and assistants; distribution of funds.-- 2) As collections are received by the division from such cigarette taxes, it shall pay the same into a trust fund in the State Treasury designated "Cigarette Tax Collection Trust Fund" which shall be paid and distributed as follows:

(a) The division shall from month to month certify to the Chief Financial Officer the amount derived from the cigarette tax imposed by s. 210.02, less the service charges provided for in s. 215.20 and less 0.9 percent of the amount derived from the cigarette tax imposed by s. 210.02, which shall be deposited into the Alcoholic Beverage and Tobacco Trust Fund, specifying the amounts to be transferred from the Cigarette Tax Collection Trust Fund and credited on the basis of 2.9 percent of the net collections to the Revenue Sharing Trust Fund for Counties and 29.3 percent of the net collections for the funding of indigent health care to the Public Medical Assistance Trust Fund.

Section 206.05 Bond required of licensed terminal supplier, importer, exporter, or wholesaler - (1) Each terminal supplier, importer, exporter, or wholesaler, except a municipality, county, school board, state agency, federal agency, or special district which is licensed under this part, shall file with the department a bond in a penal sum of not more than $100,000, such sum to be approximately 3 times the combined average monthly tax levied under this part and local option tax on motor fuel paid or due during the preceding 12 calendar months under the laws of this state. An exporter shall file a bond in an amount equal to 3 times the average monthly tax due on gallons acquired for export. The bond shall be in such form as may be approved by the department, executed by a surety company duly licensed to do business under the laws of the state as surety thereon, and conditioned upon the prompt filing of true reports and the payment to the department of any and all fuel taxes levied under this chapter including local option taxes which are now or which hereafter may be levied or imposed, together with any and all penalties and interest thereon, and generally upon faithful compliance with the provisions of the fuel tax and local option tax laws of the state. The licensee shall be the principal obligor, and the state shall be the obligee. An assigned time deposit or irrevocable letter of credit may be accepted in lieu of a surety bond.

(2) In the event that liability upon the bond thus filed with the department is discharged or reduced, whether by judgment rendered, payment made, or otherwise, or if in the opinion of the department any surety on the bond theretofore given has become unsatisfactory or unacceptable, then the department may require a new bond with satisfactory sureties in the same amount, failing which the department shall forthwith cancel the license. If such new bond is furnished as above provided, the department shall cancel and surrender the bond of the person for which such new bond is substituted.

(3) In the event that the department decides that the amount of the existing bond is insufficient to ensure payment to the state of the amount of the tax and any penalties and interest for which the person is or may at any time become liable, then that person shall forthwith, upon the written demand of the department, file additional bond in the same manner and form with like security thereon as hereinbefore provided, and the department shall forthwith cancel the license of anyone failing to file an additional bond as herein provided.

(4) Any surety on any bond furnished by a person, as above provided, shall be released and discharged from any and all liability to the state accruing on such bond after the expiration of 60 days from the date upon which such surety has filed with the department written request to be released and discharged. However, such request shall not operate to relieve, release, or discharge such surety from any liability already accrued, or which shall accrue, before the expiration of the 60-day period. The department shall, promptly on receipt of notice of such request, notify the licensee who furnished the bond, and, unless the licensee on or before the expiration of the 60-day period files with the department a new bond with a surety company satisfactory to the department in the amount and form hereinbefore in this section provided, the department shall forthwith cancel the license. If the new bond is furnished as above provided, the department shall cancel and surrender the bond of the licensee for which the new bond is provided.

Section 206.879 State and local alternative fuel user fee clearing trust funds; distribution.-- (1) Notwithstanding the provisions of s. 206.875, the revenues from the state alternative fuel fees imposed by s. 206.877 shall be deposited into the State Alternative Fuel User Fee Clearing Trust Fund, which is hereby created. After deducting the service charges provided in s. 215.20, the proceeds in this trust fund shall be distributed as follows: one-fifth of the proceeds in calendar year 1991, one-third of the proceeds in calendar year 1992, three-sevenths of the proceeds in calendar year 1993, and one-half of the proceeds in each calendar year thereafter shall be transferred to the State Transportation Trust Fund; the remainder shall be distributed as follows: 50 percent shall be transferred to the State Board of Administration for distribution according to the provisions of s. 16, Art. IX of the State Constitution of 1885, as amended; 25 percent shall be transferred to the Revenue Sharing Trust Fund for Municipalities; and the remaining 25 percent shall be distributed using the formula contained in s. 206.60(1).

Section 218.25 Limitation of shared funds; holders of bonds protected; limitation on use of second guaranteed entitlement for counties -- (1) Except as provided in subsection (2) with respect to the second guaranteed entitlement for counties, local governments shall not use any portion of the moneys received in excess of the guaranteed entitlement from the revenue sharing trust funds created by this part to assign, pledge, or set aside as a trust for the payment of principal or interest on bonds, tax anticipation certificates, or any other form of indebtedness, and there shall be no other use restriction on revenues shared pursuant to this part. The state does hereby covenant with holders of bonds or other instruments of indebtedness issued by local governments prior to July 1, 1972, that it is not the intent of this part to affect adversely the rights of said holders or to relieve local governments of the duty to meet their obligations as a result of previous pledges or assignments or trusts entered into which obligated funds received from

revenue sources which by terms of this part shall henceforth be distributed out of the revenue sharing trust funds.

(2) The second guaranteed entitlement for counties may be assigned, pledged, or set aside as a trust for the payment of principal or interest on bonds, tax anticipation certificates, or any other form of indebtedness, including obligations issued to acquire an insurance contract or contracts from a local government liability pool and including payments required pursuant to any loan agreement entered into to provide funds to acquire an insurance contract or contracts from a local government liability pool.

(3) As an additional assurance to holders of bonds issued before April 18, 2000, which are secured by the guaranteed entitlement or second guaranteed entitlement for counties, or bonds issued to refund such bonds which mature no later than the bonds that they refunded and which result in a reduction of debt service payable in each fiscal year, it is the intent of the Legislature that, to the extent the elimination of tax sources dedicated to funding the guaranteed entitlement or the second guaranteed entitlement for counties or a reduction in the rate of assessment of such taxes results in an inability of a county to pay debt service on such bonds, the Legislature will provide alternative funding sources in an amount sufficient to pay any deficit in the amount required for such debt service. This commitment of the Legislature is contingent on the county first using any funds available under this part for the payment of such debt service.

(4) Notwithstanding subsections (1) and (2), a local government may assign, pledge, or set aside as a trust for the payment of principal or interest on bonds, tax anticipation certificates, or any other form of indebtedness an amount up to 50 percent of the funds received in the prior year.

Section 206.605 Municipal tax on motor fuel -- (1) The proceeds of the municipal fuel tax imposed pursuant to s. 206.41(1)(c), after deducting the service charge pursuant to chapter 215 and the administrative costs incurred by the department in collecting, administering, enforcing, and distributing the tax, which administrative costs may not exceed 2 percent of collections, shall be transferred into the Revenue Sharing Trust Fund for Municipalities.

(2) Funds available under this section shall be used only for purchase of transportation facilities and road and street rights-of-way; construction, reconstruction, and maintenance of roads, streets, bicycle paths, and pedestrian pathways; adjustment of city-owned utilities as required by road and street construction; and construction, reconstruction, transportation-related public safety activities, maintenance, and operation of transportation facilities. Municipalities are authorized to expend the funds received under this section in conjunction with other cities or counties or state or federal government in joint projects.

(3)(a) If any municipality subject to this section does not have the transportation facilities capability, the municipality may designate by resolution the projects to be undertaken, and the engineering may be thereafter performed and administered and the construction administered by the Department of Transportation or, in the case of a municipality, by the appropriate county, if such county has the capability and agrees to undertake the projects.

(b) In the event the municipality desires the Department of Transportation either to perform or administer the engineering services or to administer the construction, or both, it must so indicate at the time of the presentation of the annual budget or it must so designate at the time the county presents its annual budget.

Section 125.0104 Tourist development tax; procedure for levying; authorized uses; referendum; enforcement -- (5) AUTHORIZED USES OF REVENUE -- (a) All tax revenues received pursuant to this section by a county imposing the tourist development tax shall be used by that county for the following purposes only:

1. To acquire, construct, extend, enlarge, remodel, repair, improve, maintain, operate, or promote one or more publicly owned and operated convention centers, sports stadiums, sports arenas, coliseums, or auditoriums, or museums that are publicly owned and operated or owned and operated by not-for-profit organizations and open to the public, within the boundaries of the county or subcounty special taxing district in which the tax is levied. Tax revenues received pursuant to this section may also be used for promotion of zoological parks that are publicly owned and operated or owned and operated by not-for-profit organizations and open to the public. However, these purposes may be implemented through service contracts and leases with lessees with sufficient expertise or financial capability to operate such facilities;

2. To promote and advertise tourism in the State of Florida and nationally and internationally; however, if tax revenues are expended for an activity, service, venue, or event, the activity, service, venue, or event shall have as one of its main purposes the attraction of tourists as evidenced by the promotion of the activity, service, venue, or event to tourists;

3. To fund convention bureaus, tourist bureaus, tourist information centers, and news bureaus as county agencies or by contract with the chambers of commerce or similar associations in the county, which may include any indirect administrative costs for services performed by the county on behalf of the promotion agency; or

4. To finance beach park facilities or beach improvement, maintenance, renourishment, restoration, and erosion control, including shoreline protection, enhancement, cleanup, or restoration of inland lakes and rivers to which there is public access as those uses relate to the physical preservation of the beach, shoreline, or inland lake or river. However, any funds identified by a county as the local matching source for beach renourishment, restoration, or erosion control projects included in the long-range budget plan of the state's Beach Management Plan, pursuant to s. 161.091, or funds contractually obligated by a county in the financial plan for a federally authorized shore protection project may not be used or loaned for any other purpose. In counties of less than 100,000 population, no more than 10 percent of the revenues from the tourist development tax may be used for beach park facilities.

(b) Tax revenues received pursuant to this section by a county of less than 750,000 population imposing a tourist development tax may only be used by that county for the following purposes in addition to those purposes allowed pursuant to paragraph (a): to acquire, construct, extend, enlarge, remodel, repair, improve, maintain, operate, or promote one or more zoological parks, fishing piers or nature centers which are publicly owned and operated or owned and operated by not-for-profit organizations and open to the public. All population figures relating to this subsection shall be based on the most recent population estimates prepared pursuant to the provisions of s. 186.901. These population estimates shall be those in effect on July 1 of each year.

(c) The revenues to be derived from the tourist development tax may be pledged to secure and liquidate revenue bonds issued by the county for the purposes set forth in subparagraphs (a)1. and 4. or for the purpose of refunding bonds previously issued for such purposes, or both; however, no more than 50 percent of the revenues from the tourist development tax may be pledged to secure and liquidate revenue bonds or revenue refunding bonds issued for the purposes set forth in subparagraph (a)4. Such revenue bonds and revenue refunding bonds may

be authorized and issued in such principal amounts, with such interest rates and maturity dates, and subject to such other terms, conditions, and covenants as the governing board of the county shall provide. The Legislature intends that this paragraph shall be full and complete authority for accomplishing such purposes, but such authority shall be supplemental and additional to, and not in derogation of, any powers now existing or later conferred under law.

(d) Any use of the local option tourist development tax revenues collected pursuant to this section for a purpose not expressly authorized by paragraph (3)(l) or paragraph (3)(n) or paragraph (a), paragraph (b), or paragraph (c) of this subsection is expressly prohibited.

Section 212.0305 Convention development taxes; intent; administration; authorization; use of proceeds -- (1) TITLE.--This section may be cited as the "Convention Development Tax Act."

(2) LEGISLATIVE INTENT.--No convention development tax on transient rentals shall be imposed by the governing body of any county unless specifically authorized herein. Any tax authorized pursuant to this section shall be administered and collected exclusively as provided herein and may consist of one or more component levies as enumerated in subsection (4). It is the legislative intent that any authorization for imposition of a convention development tax shall be published in the Florida Statutes as a paragraph of subsection (4), irrespective of the duration of the levy. Each enactment shall specify the types of local governments authorized to levy a convention development tax; the rate or rates which may be imposed; the maximum length of time the tax may be imposed, if any; the procedure which must be followed to secure voter approval, if required; the purpose for which the proceeds may be expended; and such other requirements as the Legislature may provide. One of the principal purposes of the convention development tax is to promote tourism and the use of hotel facilities by facilitating the improvement and construction of convention centers. Any municipality or county wherein the convention development tax is levied is specifically authorized to adopt and implement a convention center booking policy to apply to convention centers owned or operated by a municipality or county which gives priority to bookings after July 1, 1993, in accordance with the minimum number of hotel rooms to be utilized in connection with such convention center bookings or in accordance with the impact of such bookings on the convention development tax generated.

(3) APPLICATION; ADMINISTRATION; PENALTIES.--

(a) The convention development tax on transient rentals imposed by the governing body of any county authorized to so levy shall apply to the amount of any payment made by any person to rent, lease, or use for a period of 6 months or less any living quarters or accommodations in a hotel, apartment hotel, motel, resort motel, apartment, apartment motel, roominghouse, tourist or trailer camp, mobile home park, recreational vehicle park, or condominium. When receipt of consideration is by way of property other than money, the tax shall be levied and imposed on the fair market value of such nonmonetary consideration. Any payment made by a person to rent, lease, or use any living quarters or accommodations which are exempt from the tax imposed under s. 212.03 shall likewise be exempt from any tax imposed under this section.

(b) The tax shall be charged by the person receiving the consideration for the lease or rental, and the tax shall be collected from the lessee, tenant, or customer at the time of payment of the consideration for such lease or rental.

(c) The person receiving the consideration for such rental or lease shall receive, account for, and remit the tax to the department at the time and in the manner provided for persons who collect

and remit taxes under s. 212.03. The same duties and privileges imposed by this chapter upon dealers in tangible property respecting the collection and remission of tax; the making of returns; the keeping of books, records, and accounts; and compliance with the rules of the department in the administration of this chapter apply to and are binding upon all persons who are subject to the provisions of this section. However, the department may authorize a quarterly return and payment when the tax remitted by the dealer for the preceding quarter did not exceed $25.

(d) The department shall keep records showing the amount of taxes collected, which records shall disclose the taxes collected from each county in which a local government resort tax is levied. These records shall be subject to the provisions of s. 213.053 and are confidential and exempt from the provisions of s. 119.07(1).

(e) The collections received by the department from the tax, less costs of administration, shall be paid and returned monthly to the county which imposed the tax, for use by the county as provided in this section. Such receipts shall be placed in a specific trust fund or funds created by the county.

(f) The department shall promulgate such rules and shall prescribe and publish such forms as may be necessary to effectuate the purposes of this section. The department is authorized to establish audit procedures and to assess for delinquent taxes.

(g) The estimated tax provisions contained in s. 212.11 do not apply to the administration of any tax levied under this section.

(h) Any person taxable under this section who, either by himself or herself or through the person's agents or employees, fails or refuses to charge and collect the taxes herein provided from the person paying any rental or lease is, in addition to being personally liable for the payment of the tax, guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 or s. 775.083.

(i) No person shall advertise or hold out to the public in any manner, directly or indirectly, that he or she will absorb all or any part of the tax; that he or she will relieve the person paying the rental of the payment of all or any part of the tax; or that the tax will not be added to the rental or lease consideration or, if added, that the tax or any part thereof will be refunded or refused, either directly or indirectly, by any method whatsoever. Any person who willfully violates any provision of this paragraph is guilty of a misdemeanor of the first degree, punishable as provided in s. 775.082 or s. 775.083.

(j) The tax shall constitute a lien on the property of the lessee, customer, or tenant in the same manner as, and shall be collectible as are, liens authorized and imposed by ss. 713.67, 713.68, and 713.69.

(k) Any tax levied pursuant to this section shall be in addition to any other tax imposed pursuant to this chapter and in addition to all other taxes and fees and the consideration for the rental or lease.

(l) The department shall administer the taxes levied herein as increases in the rate of the tax authorized in s. 125.0104. The department shall collect and enforce the provisions of this section and s. 125.0104 in conjunction with each other in those counties authorized to levy the taxes authorized herein. The department shall distribute the proceeds received from the taxes levied pursuant to this section and s. 125.0104 in proportion to the rates of the taxes authorized to the

appropriate trust funds as provided by law. In the event of underpayment of the total amount due by a taxpayer pursuant to this section and s. 125.0104, the department shall distribute the amount received in proportion to the rates of the taxes authorized to the appropriate trust funds as provided by law and the penalties and interest due on both of said taxes shall be applicable.

(4) AUTHORIZATION TO LEVY; USE OF PROCEEDS; OTHER REQUIREMENTS.--

(a) *Consolidated government levy for convention development.*--

1. Each county that operates under a government consolidated with that of one or more municipalities in the county may impose, pursuant to an ordinance enacted by the governing body of the county, a levy on the exercise within its boundaries of the taxable privilege of leasing or letting transient rental accommodations described in subsection (3) at the rate of 2 percent of each dollar and major fraction of each dollar of the total consideration charged therefor. The proceeds of this levy shall be known as the consolidated county convention development tax.

2. The county shall furnish to the department, within 10 days after approval of the ordinance imposing the levy, a copy of the ordinance. The effective date of imposition of the levy must be the first day of any month that is at least 60 days after enactment of the ordinance.

3. All consolidated county convention development moneys, including any interest accrued thereon, received by a county imposing the levy must be used in any of the following manners, although the utilization authorized in sub-subparagraph a. shall apply only to municipalities with a population of 10,000 or more:

a. To promote and advertise tourism;

b. To extend, enlarge, and improve existing publicly owned convention centers in the county;

c. To construct a multipurpose convention/coliseum/exhibition center or the maximum components thereof as funds permit in the county; and

d. To acquire, construct, extend, enlarge, remodel, repair, improve, or maintain one or more convention centers, stadiums, exhibition halls, arenas, coliseums, or auditoriums.

4. For the purposes of completion of any project under this paragraph, tax revenues and interest accrued may be used:

a. As collateral, pledged, or hypothecated for projects authorized by this paragraph, including bonds issued in connection therewith; or

b. As a pledge or capital contribution in conjunction with a partnership, joint venture, or other business arrangement between the county and one or more business entities for projects authorized by this paragraph.

5.a. The county may designate or appoint an authority to administer and disburse such proceeds and any other related source of revenue. However, the annual budget of the authority is subject to approval of the governing body of the county.

b. Except as otherwise provided by law, one-half of the proceeds of the tax which are collected within a municipality the government of which is not consolidated with that of the county must, at the request of the governing body of the municipality, be remitted to the municipality. The revenue remitted to a municipality under this sub-subparagraph may be used by the municipality only for the purposes and in the manner authorized in this paragraph, but the municipality may enter into an interlocal agreement with the county or with any other municipality in the county to use such revenue to jointly finance any project authorized by this paragraph. This sub-subparagraph does not apply to the distribution to the county of any convention development tax revenues necessary to repay the principal of or the interest on any bonds issued under sub-subparagraph 4.a. before May 29, 1984. Notwithstanding this sub-subparagraph, if the governing body of such a municipality adopts a resolution stating that the municipality is unable to use such revenue for any purpose authorized in this paragraph, the municipality may use the revenue to acquire and develop municipal parks, lifeguard stations, or athletic fields.

6. The consolidated county convention development tax shall be in addition to any other levy imposed under this section.

7. Revenues collected and returned to the county must be deposited in a convention development trust fund, which must be established by the county as a condition precedent to receipt of such funds.

(b) *Charter county levy for convention development.--*

1. Each county, as defined in s. 125.011(1), may impose, pursuant to an ordinance enacted by the governing body of the county, a levy on the exercise within its boundaries of the taxable privilege of leasing or letting transient rental accommodations described in subsection (3) at the rate of 3 percent of the total consideration charged therefor. The proceeds of this levy shall be known as the charter county convention development tax.

2. All charter county convention development moneys, including any interest accrued thereon, received by a county imposing the levy shall be used as follows:

a. Two-thirds of the proceeds shall be used to extend, enlarge, and improve the largest existing publicly owned convention center in the county.

b. One-third of the proceeds shall be used to construct a new multipurpose convention/coliseum/exhibition center/stadium or the maximum components thereof as funds permit in the most populous municipality in the county.

c. After the completion of any project under sub-subparagraph a., the tax revenues and interest accrued under sub-subparagraph a. may be used to acquire, construct, extend, enlarge, remodel, repair, improve, plan for, operate, manage, or maintain one or more convention centers, stadiums, exhibition halls, arenas, coliseums, or auditoriums, and may be used to acquire and construct an intercity light rail transportation system as described in the Light Rail Transit System Status Report to the Legislature dated April 1988, which shall provide a means to transport persons to and from the largest existing publicly owned convention center in the county and the hotels north of the convention center and to and from the downtown area of the most populous municipality in the county as determined by the county.

d. After completion of any project under sub-subparagraph b., the tax revenues and interest accrued under sub-subparagraph b. may be used, as determined by the county, to operate an authority created pursuant to subparagraph 4. or to acquire, construct, extend, enlarge, remodel, repair, improve, operate, or maintain one or more convention centers, stadiums, exhibition halls, arenas, coliseums, auditoriums, golf courses, or related buildings and parking facilities in the most populous municipality in the county.

e. For the purposes of completion of any project pursuant to this paragraph, tax revenues and interest accrued may be used:

(I) As collateral, pledged, or hypothecated for projects authorized by this paragraph, including bonds issued in connection therewith; or

(II) As a pledge or capital contribution in conjunction with a partnership, joint venture, or other business arrangement between a municipality and one or more business entities for projects authorized by this paragraph.

3. The governing body of each municipality in which a municipal tourist tax is levied may adopt a resolution prohibiting imposition of the charter county convention development levy within such municipality. If the governing body adopts such a resolution, the convention development levy shall be imposed by the county in all other areas of the county except such municipality. No funds collected pursuant to this paragraph may be expended in a municipality which has adopted such a resolution.

4.a. Before the county enacts an ordinance imposing the levy, the county shall notify the governing body of each municipality in which projects are to be developed pursuant to sub-subparagraph 2.a., sub-subparagraph 2.b., sub-subparagraph 2.c., or sub-subparagraph 2.d. As a condition precedent to receiving funding, the governing bodies of such municipalities shall designate or appoint an authority that shall have the sole power to:

(I) Approve the concept, location, program, and design of the facilities or improvements to be built in accordance with this paragraph and to administer and disburse such proceeds and any other related source of revenue.

(II) Appoint and dismiss the authority's executive director, general counsel, and any other consultants retained by the authority. The governing body shall have the right to approve or disapprove the initial appointment of the authority's executive director and general counsel.

b. The members of each such authority shall serve for a term of not less than 1 year and shall be appointed by the governing body of such municipality. The annual budget of such authority shall be subject to approval of the governing body of the municipality. If the governing body does not approve the budget, the authority shall use as the authority's budget the previous fiscal year budget.

c. The authority, by resolution to be adopted from time to time, may invest and reinvest the proceeds from the convention development tax and any other revenues generated by the authority in the same manner that the municipality in which the authority is located may invest surplus funds.

5. The charter county convention development levy shall be in addition to any other levy imposed pursuant to this section.

6. A certified copy of the ordinance imposing the levy shall be furnished by the county to the department within 10 days after approval of such ordinance. The effective date of imposition of the levy shall be the first day of any month at least 60 days after enactment of the ordinance.

7. Revenues collected pursuant to this paragraph shall be deposited in a convention development trust fund, which shall be established by the county as a condition precedent to receipt of such funds.

(c) *Special district levy for convention development.--*

1. Each county which was chartered under Art. VIII of the State Constitution and which on January 1, 1984, levied a tourist advertising ad valorem tax within a special taxing district in that county may impose, pursuant to an ordinance enacted by the governing body of the county, a levy within the boundaries of such special taxing district on the exercise of the taxable privilege of leasing or letting transient rental accommodations described in subsection (3) at a rate of up to 3 percent of each dollar and major fraction of each dollar of the total consideration charged therefor. The proceeds of this levy shall be known as the special district convention development tax.

2. The county shall designate or appoint an authority to administer and disburse the proceeds of such levy and any revenue related to the levy authorized by this paragraph. The members of such authority shall be selected from persons involved in the tourism and lodging industries doing business within such special district. Not less than a majority of the members shall be selected from persons doing business in the lodging industry. Members shall serve at the pleasure of the governing body of such county and shall serve without compensation. The annual budget of such authority shall be subject to approval of the governing body of the county. The authority shall consist of 11 members, who shall annually select a chair from among their members.

3. The county shall have no power to levy and impose the tourist advertising ad valorem tax in such district on or after January 1 of the year following the date of the adoption of the levy authorized in this paragraph. All special district convention development moneys, including any interest accrued thereon, received by a county imposing the special district convention development levy shall be used for the following purposes only:

a. To promote and advertise tourism;

b. To fund convention bureaus, tourist bureaus, tourist information centers, and news bureaus.

4. The special district convention development tax shall be in addition to any other levy imposed pursuant to this section.

5. A certified copy of the ordinance imposing the levy shall be furnished by the county to the department within 10 days after approval of such ordinance. The effective date of the levy shall be the first day of any month at least 60 days after enactment of the ordinance.

6. Revenues collected and returned to the county shall be deposited in a convention development trust fund, which shall be established by the county as a condition precedent to receipt of such funds.

(d) *Special levy for convention development.--*

1. Each county which was chartered under Art. VIII of the State Constitution and which on January 1, 1984, levied a tourist advertising ad valorem tax within a special taxing district in that county may impose, pursuant to an ordinance enacted by the governing body of the county, a levy outside the boundaries of such special taxing district and to the southeast of State Road 415, on the exercise of the taxable privilege of leasing or letting transient rental accommodations described in subsection (3), at a rate of up to 3 percent of each dollar and major fraction of each dollar of the total consideration charged therefor. The proceeds of this levy shall be known as the special convention development tax.

2. The county shall designate or appoint an authority to administer and disburse the proceeds of such levy and any revenue related to the levy authorized by this paragraph. The members of the authority shall be selected from persons doing business within the area in which the tax is levied. Not less than three of the members shall be selected from persons doing business in the lodging industry. Members shall serve at the pleasure of the governing body of the county and shall serve without compensation. The annual budget of the authority shall be subject to approval of the governing body of the county. The authority shall consist of seven members, who shall annually select a chair from among their members.

3. All special convention development moneys, including any interest accrued thereon, received by a county imposing the special convention development levy shall be used for the following purposes only:

a. To promote and advertise tourism;

b. To fund convention bureaus, tourist bureaus, tourist information centers, and news bureaus.

4. The special convention development tax shall be in addition to any other levy imposed pursuant to this section.

5. A certified copy of the ordinance imposing the levy shall be furnished by the county to the department within 10 days after approval of the ordinance. The effective date of the levy shall be the first day of any month at least 60 days after enactment of the ordinance.

6. Revenues collected and returned to the county shall be deposited in a separate convention development trust fund, which shall be established by the county as a condition precedent to receipt of such funds.

(e) *Subcounty levy for convention development.--*

1. Each county which was chartered under Art. VIII of the State Constitution and which on January 1, 1984, levied a tourist advertising ad valorem tax within a special taxing district in that county may impose, pursuant to an ordinance enacted by the governing body of the county, a levy outside the boundaries of such special taxing district and to the northwest of State Road 415, on the exercise of the taxable privilege of leasing or letting transient rental accommodations

described in subsection (3), at a rate of up to 3 percent of each dollar and major fraction of each dollar of the total consideration charged therefor. The proceeds of this levy shall be known as the subcounty convention development tax.

2. The county shall designate or appoint an authority to administer and disburse the proceeds of such levy and any revenue related to the levy authorized by this paragraph. The members of the authority shall be selected from persons doing business within the area in which the tax is levied. Not less than three of the members shall be selected from persons doing business in the lodging industry. Members shall serve at the pleasure of the governing body of the county and shall serve without compensation. The annual budget of the authority shall be subject to approval of the governing body of the county. The authority shall consist of seven members, who shall annually select a chair from among their members.

3. All subcounty convention development moneys, including any interest accrued thereon, received by a county imposing the subcounty convention development levy shall be used for the following purposes only:

a. To promote and advertise tourism;

b. To fund convention bureaus, tourist bureaus, tourist information centers, and news bureaus.

4. The subcounty convention development tax shall be in addition to any other levy imposed pursuant to this section.

5. A certified copy of the ordinance imposing the levy shall be furnished by the county to the department within 10 days after approval of the ordinance. The effective date of the levy shall be the first day of any month at least 60 days after enactment of the ordinance.

6. Revenues collected and returned to the county shall be deposited in a separate convention development trust fund, which shall be established by the county as a condition precedent to receipt of such funds.

(5) LOCAL ADMINISTRATION OF TAX.--

(a) A county levying a tax under the provisions of this section may be exempt from the requirements of this section that the tax collected be remitted to the Department of Revenue before being returned to the county and that such tax be administered according to the provisions of this chapter, if the county adopts an ordinance providing for the collection and administration of the tax on a local basis.

(b) The ordinance shall include provision for, but need not be limited to:

1. Initial collection of the tax to be made in the same manner as the tax imposed under this chapter.

2. Designation of the local official to whom the tax shall be remitted and that official's powers and duties with respect thereto. Tax revenues may be used only in accordance with the provisions of this section.

3. Requirements respecting the keeping of appropriate books, records, and accounts by those responsible for collecting and administering the tax.

4. Payment of a dealer's credit as required under this chapter.

5. A portion of the tax collected may be retained by the county for costs of administration, but such portion shall not exceed 2 percent of collections.

[1](c) A county adopting an ordinance providing for the collection and administration of the tax on a local basis shall also adopt an ordinance electing either to assume all responsibility for auditing the records and accounts of dealers, and assessing, collecting, and enforcing payments of delinquent taxes, or to delegate such authority to the Department of Revenue. If the county elects to assume such responsibility, it shall be bound by the rules promulgated by the Department of Revenue pursuant to paragraph (3)(f), as well as those rules pertaining to the sales and use tax on transient rentals imposed by s. 212.03. The county may use any power granted in this chapter to the department to determine the amount of tax, penalties, and interest to be paid by each dealer and to enforce payment of such tax, penalties, and interest. The county may use a certified public accountant licensed in this state in the administration of its statutory duties and responsibilities. Such certified public accountants are bound by the same confidentiality requirements and subject to the same penalties as the county under s. 213.053. If the county delegates such authority to the department, the department shall distribute any collections so received, less costs of administration, to the county. The amount deducted for costs of administration by the department shall be used only for those costs which are solely and directly attributable to auditing, assessing, collecting, processing, and enforcing payments of delinquent taxes authorized in this section. If a county elects to delegate such authority to the department, the department shall audit only those businesses in the county that it audits pursuant to this chapter.

Section 212.03055 Super majority vote required for levy at rate in excess of 2 percent under ch. 95-290 --A special taxing district may not levy a tax under chapter 95-290, Laws of Florida, at a rate in excess of 2 percent unless the levy of such tax is approved by a super majority (a majority plus one) vote of the members of the governing body of the county in which the special taxing district is located.

Section 218.23 Revenue sharing with units of local government -- (1) To be eligible to participate in revenue sharing beyond the minimum entitlement in any fiscal year, a unit of local government is required to have:

(a) Reported its finances for its most recently completed fiscal year to the Department of Financial Services, pursuant to s. 218.32.

(b) Made provisions for annual postaudits of its financial accounts in accordance with provisions of law.

(c) Levied, as shown on its most recent financial report pursuant to s. 218.32, ad valorem taxes, exclusive of taxes levied for debt service or other special millages authorized by the voters, to produce the revenue equivalent to a millage rate of 3 mills on the dollar based on the 1973 taxable values as certified by the property appraiser pursuant to s. 193.122(2) or, in order to produce revenue equivalent to that which would otherwise be produced by such 3-mill ad valorem tax, to have received a remittance from the county pursuant to s. 125.01(6)(a), collected an occupational license tax or a utility tax, levied an ad valorem tax, or received revenue from any combination of these four sources. If a new municipality is incorporated, the provisions of this paragraph shall

apply to the taxable values for the year of incorporation as certified by the property appraiser. This paragraph requires only a minimum amount of revenue to be raised from the ad valorem tax, the occupational license tax, and the utility tax. It does not require a minimum millage rate.

(d) Certified that persons in its employ as law enforcement officers, as defined in s. 943.10(1), meet the qualifications for employment as established by the Criminal Justice Standards and Training Commission; that its salary structure and salary plans meet the provisions of chapter 943; and that no law enforcement officer is compensated for his or her services at an annual salary rate of less than $6,000. However, the department may waive the minimum law enforcement officer salary requirement if a city or county certifies that it is levying ad valorem taxes at 10 mills.

(e) Certified that persons in its employ as firefighters, as defined in s. 633.30(1), meet the qualification for employment as established by the Division of State Fire Marshal pursuant to the provisions of ss. 633.34 and 633.35 and that the provisions of s. 633.382 have been met.

(f) Certified that each dependent special district that is budgeted separately from the general budget of the local governing authority has met the provisions for annual postaudit of its financial accounts in accordance with the provisions of law.

Additionally, to receive its share of revenue sharing funds, a unit of local government shall certify to the Department of Revenue that the requirements of s. 200.065, if applicable, were met. The certification shall be made annually within 30 days of adoption of an ordinance or resolution establishing a final property tax levy or, if no property tax is levied, not later than November 1. The portion of revenue sharing funds which, pursuant to this part, would otherwise be distributed to a unit of local government which has not certified compliance or has otherwise failed to meet the requirements of s. 200.065 shall be deposited in the General Revenue Fund for the 12 months following a determination of noncompliance by the department.

(2) Any unit of local government which is consolidated as provided by s. 9, Art. VIII of the State Constitution of 1885, as preserved by s. 6(e), Art. VIII, 1968 revised constitution, shall receive an annual distribution from the Revenue Sharing Trust Fund for Counties equal to $6.24 times its population.

(3) The distribution to a unit of local government under this part is determined by the following formula:

(a) First, the entitlement of an eligible unit of local government shall be computed on the basis of the apportionment factor provided in s. 218.245, which shall be applied for all eligible units of local government to all receipts available for distribution in the respective revenue sharing trust fund.

(b) Second, revenue shared with eligible units of local government for any fiscal year shall be adjusted so that no eligible unit of local government receives less funds than its guaranteed entitlement.

(c) Third, revenues shared with counties for any fiscal year shall be adjusted so that no county receives less funds than its guaranteed entitlement plus the second guaranteed entitlement for counties.

(d) Fourth, revenue shared with units of local government for any fiscal year shall be adjusted so that no unit of local government receives less funds than its minimum entitlement.

(e) Fifth, after the adjustments provided in paragraphs (b), (c), and (d), and after deducting the amount committed to all the units of local government, the funds remaining in the respective trust funds shall be distributed to those eligible units of local government which qualify to receive additional moneys beyond the guaranteed entitlement, on the basis of the additional money of each qualified unit of local government in proportion to the total additional money of all qualified units of local government.

(4) Notwithstanding the provisions of paragraph (1)(c), no unit of local government which was eligible to participate in revenue sharing in the 3 years prior to initially participating in the local government half-cent sales tax shall be ineligible to participate in revenue sharing solely due to a millage or utility tax reduction afforded by the local government half-cent sales tax.

Section 218.63 Participation requirements -- (1) Only those units of local government which meet the eligibility requirements for revenue sharing pursuant to s. 218.23 shall participate in the local government half-cent sales tax. However, a municipality incorporated subsequent to the effective date of chapter 82-154, Laws of Florida, which does not meet the applicable criteria for incorporation pursuant to s. 165.061 shall not participate in the local government half-cent sales tax. In either case, distributions to eligible units of local government in that county shall be made as though the nonparticipating municipality had not incorporated.

(2) The moneys which otherwise would be distributed pursuant to this part to a unit of local government failing to certify compliance as required by s. 218.23(1) or having otherwise failed to meet the requirements of s. 200.065 shall be deposited in the General Revenue Fund for the 12 months following a determination of noncompliance by the department.

Section 165.061 Standards for incorporation, merger, and dissolution -- (1) The incorporation of a new municipality, other than through merger of existing municipalities, must meet the following conditions in the area proposed for incorporation:

(a) It must be compact and contiguous and amenable to separate municipal government.

(b) It must have a total population, as determined in the latest official state census, special census, or estimate of population, in the area proposed to be incorporated of at least 1,500 persons in counties with a population of 75,000 or less, and of at least 5,000 population in counties with a population of more than 75,000.

(c) It must have an average population density of at least 1.5 persons per acre or have extraordinary conditions requiring the establishment of a municipal corporation with less existing density.

(d) It must have a minimum distance of any part of the area proposed for incorporation from the boundaries of an existing municipality within the county of at least 2 miles or have an extraordinary natural boundary which requires separate municipal government.

(e) It must have a proposed municipal charter which:

1. Prescribes the form of government and clearly defines the responsibility for legislative and executive functions.

2. Does not prohibit the legislative body of the municipality from exercising its powers to levy any tax authorized by the Constitution or general law.

(f) In accordance with s. 10, Art. I of the State Constitution, the plan for incorporation must honor existing solid-waste contracts in the affected geographic area subject to incorporation. However, the plan for incorporation may provide for existing contracts for solid-waste-collection services to be honored only for 5 years or the remainder of the contract term, whichever is less, and may require that a copy of the pertinent portion of the contract or other written evidence of the duration of the contract, excluding any automatic renewals or evergreen provisions, be provided to the municipality within a reasonable time after a written request to do so.

(2) The incorporation of a new municipality through merger of existing municipalities and associated unincorporated areas must meet the following conditions:

(a) The area proposed for incorporation must be compact and contiguous and susceptible to urban services.

(b) Any unincorporated area to be included must meet the standards provided in s. 171.042, if available.

(c) The plan for merger and incorporation must provide for an equitable arrangement in relation to bonded indebtedness and the status and pension rights of employees of each governmental unit proposed to be merged.

(d) In accordance with s. 10, Art. I of the State Constitution, the plan for merger must honor existing solid-waste contracts in the affected geographic area subject to merger. However, the plan for merger may provide for existing contracts for solid-waste-collection services to be honored only for 5 years or the remainder of the contract term, whichever is shorter, and may require that a copy of the pertinent portion of the contract or other written evidence of the duration of the contract, excluding any automatic renewals or so-called "evergreen" provisions, be provided to the municipality within a reasonable time following a written request to do so.

(3) The dissolution of a municipality must meet the following conditions:

(a) The municipality to be dissolved must not be substantially surrounded by other municipalities.

(b) The county or another municipality must be demonstrably able to provide necessary services to the municipal area proposed for dissolution.

(c) An equitable arrangement must be made in relation to bonded indebtedness and vested rights of employees of the municipality to be dissolved.

Section 125.0104 Tourist development tax; procedure for levying; authorized uses; referendum; enforcement.—(3) TAXABLE PRIVILEGES; EXEMPTIONS; LEVY; RATE.—

(l) In addition to any other tax which is imposed pursuant to this section, a county may impose up to an additional 1-percent tax on the exercise of the privilege described in paragraph (a) by majority vote of the governing board of the county in order to:

1. Pay the debt service on bonds issued to finance the construction, reconstruction, or renovation of a professional sports franchise facility, or the acquisition, construction, reconstruction, or renovation of a retained spring training franchise facility, either publicly owned and operated, or publicly owned and operated by the owner of a professional sports franchise or other lessee with sufficient expertise or financial capability to operate such facility, and to pay the planning and design costs incurred prior to the issuance of such bonds.

2. Pay the debt service on bonds issued to finance the construction, reconstruction, or renovation of a convention center, and to pay the planning and design costs incurred prior to the issuance of such bonds.

3. Pay the operation and maintenance costs of a convention center for a period of up to 10 years. Only counties that have elected to levy the tax for the purposes authorized in subparagraph 2. may use the tax for the purposes enumerated in this subparagraph. Any county that elects to levy the tax for the purposes authorized in subparagraph 2. after July 1, 2000, may use the proceeds of the tax to pay the operation and maintenance costs of a convention center for the life of the bonds.

4. Promote and advertise tourism in the State of Florida and nationally and internationally; however, if tax revenues are expended for an activity, service, venue, or event, the activity, service, venue, or event shall have as one of its main purposes the attraction of tourists as evidenced by the promotion of the activity, service, venue, or event to tourists.

The provision of paragraph (b) which prohibits any county authorized to levy a convention development tax pursuant to s. 212.0305 from levying more than the 2-percent tax authorized by this section, and the provisions of paragraphs (4)(a)-(d), shall not apply to the additional tax authorized in this paragraph. The effective date of the levy and imposition of the tax authorized under this paragraph shall be the first day of the second month following approval of the ordinance by the governing board or the first day of any subsequent month as may be specified in the ordinance. A certified copy of such ordinance shall be furnished by the county to the Department of Revenue within 10 days after approval of such ordinance.

Section 212.0305 Convention development taxes; intent; administration; authorization; use of proceeds.-- 4) AUTHORIZATION TO LEVY; USE OF PROCEEDS; OTHER REQUIREMENTS. —

(a) *Consolidated government levy for convention development.*--

1. Each county that operates under a government consolidated with that of one or more municipalities in the county may impose, pursuant to an ordinance enacted by the governing body of the county, a levy on the exercise within its boundaries of the taxable privilege of leasing or letting transient rental accommodations described in subsection (3) at the rate of 2 percent of each dollar and major fraction of each dollar of the total consideration charged therefor. The proceeds of this levy shall be known as the consolidated county convention development tax.

2. The county shall furnish to the department, within 10 days after approval of the ordinance imposing the levy, a copy of the ordinance. The effective date of imposition of the levy must be the first day of any month that is at least 60 days after enactment of the ordinance.

3. All consolidated county convention development moneys, including any interest accrued thereon, received by a county imposing the levy must be used in any of the following manners, although the utilization authorized in sub-subparagraph a. shall apply only to municipalities with a population of 10,000 or more:

a. To promote and advertise tourism;

b. To extend, enlarge, and improve existing publicly owned convention centers in the county;

c. To construct a multipurpose convention/coliseum/exhibition center or the maximum components thereof as funds permit in the county; and

d. To acquire, construct, extend, enlarge, remodel, repair, improve, or maintain one or more convention centers, stadiums, exhibition halls, arenas, coliseums, or auditoriums.

4. For the purposes of completion of any project under this paragraph, tax revenues and interest accrued may be used:

a. As collateral, pledged, or hypothecated for projects authorized by this paragraph, including bonds issued in connection therewith; or

b. As a pledge or capital contribution in conjunction with a partnership, joint venture, or other business arrangement between the county and one or more business entities for projects authorized by this paragraph.

5.a. The county may designate or appoint an authority to administer and disburse such proceeds and any other related source of revenue. However, the annual budget of the authority is subject to approval of the governing body of the county.

b. Except as otherwise provided by law, one-half of the proceeds of the tax which are collected within a municipality the government of which is not consolidated with that of the county must, at the request of the governing body of the municipality, be remitted to the municipality. The revenue remitted to a municipality under this sub-subparagraph may be used by the municipality only for the purposes and in the manner authorized in this paragraph, but the municipality may enter into an interlocal agreement with the county or with any other municipality in the county to use such revenue to jointly finance any project authorized by this paragraph. This sub-subparagraph does not apply to the distribution to the county of any convention development tax revenues necessary to repay the principal of or the interest on any bonds issued under sub-subparagraph 4.a. before May 29, 1984. Notwithstanding this sub-subparagraph, if the governing body of such a municipality adopts a resolution stating that the municipality is unable to use such revenue for any purpose authorized in this paragraph, the municipality may use the revenue to acquire and develop municipal parks, lifeguard stations, or athletic fields.

6. The consolidated county convention development tax shall be in addition to any other levy imposed under this section.

7. Revenues collected and returned to the county must be deposited in a convention development trust fund, which must be established by the county as a condition precedent to receipt of such funds.

Section 218.62 Distribution formulas -- (1) Each participating county and municipal government shall receive a proportion of moneys earmarked for distribution within that county.

(2) The proportion for each county government shall be computed by dividing the sum of the unincorporated area population plus two-thirds of the incorporated area population by the sum of the total county population plus two-thirds of the incorporated area population.

(3) The proportion for each municipal government shall be computed by dividing the population of that municipality by the sum of the total county population plus two-thirds of the incorporated area population.

(4) Effective October 1, 2000, the apportionment factors shall, except in the case of error in the population certified pursuant to s. 186.901, remain in effect for the fiscal year. Adjustments to distributions to correct errors shall be made subsequent to receipt of a corrected population certified pursuant to s. 186.901.

Section 395.002 Definitions.--As used in this chapter:

(1) "Accrediting organizations" means the Joint Commission on Accreditation of Healthcare Organizations, the American Osteopathic Association, the Commission on Accreditation of Rehabilitation Facilities, and the Accreditation Association for Ambulatory Health Care, Inc.

(2) "Agency" means the Agency for Health Care Administration.

(3) "Ambulatory surgical center" or "mobile surgical facility" means a facility the primary purpose of which is to provide elective surgical care, in which the patient is admitted to and discharged from such facility within the same working day and is not permitted to stay overnight, and which is not part of a hospital. However, a facility existing for the primary purpose of performing terminations of pregnancy, an office maintained by a physician for the practice of medicine, or an office maintained for the practice of dentistry shall not be construed to be an ambulatory surgical center, provided that any facility or office which is certified or seeks certification as a Medicare ambulatory surgical center shall be licensed as an ambulatory surgical center pursuant to s. 395.003. Any structure or vehicle in which a physician maintains an office and practices surgery, and which can appear to the public to be a mobile office because the structure or vehicle operates at more than one address, shall be construed to be a mobile surgical facility.

(4) "Applicant" means an individual applicant, or any officer, director, or agent, or any partner or shareholder having an ownership interest equal to a 5-percent or greater interest in the corporation, partnership, or other business entity.

(5) "Biomedical waste" means any solid or liquid waste as defined in s. 381.0098(2)(a).

(6) "Clinical privileges" means the privileges granted to a physician or other licensed health care practitioner to render patient care services in a hospital, but does not include the privilege of admitting patients.

(7) "Department" means the Department of Health.

(8) "Director" means any member of the official board of directors as reported in the organization's annual corporate report to the Florida Department of State, or, if no such report is made, any member of the operating board of directors. The term excludes members of separate, restricted boards that serve only in an advisory capacity to the operating board.

(9) "Emergency medical condition" means:

(a) A medical condition manifesting itself by acute symptoms of sufficient severity, which may include severe pain, such that the absence of immediate medical attention could reasonably be expected to result in any of the following:

1. Serious jeopardy to patient health, including a pregnant woman or fetus.

2. Serious impairment to bodily functions.

3. Serious dysfunction of any bodily organ or part.

(b) With respect to a pregnant woman:

1. That there is inadequate time to effect safe transfer to another hospital prior to delivery;

2. That a transfer may pose a threat to the health and safety of the patient or fetus; or

3. That there is evidence of the onset and persistence of uterine contractions or rupture of the membranes.

(10) "Emergency services and care" means medical screening, examination, and evaluation by a physician, or, to the extent permitted by applicable law, by other appropriate personnel under the supervision of a physician, to determine if an emergency medical condition exists and, if it does, the care, treatment, or surgery by a physician necessary to relieve or eliminate the emergency medical condition, within the service capability of the facility.

(11) "General hospital" means any facility which meets the provisions of subsection (13) and which regularly makes its facilities and services available to the general population.

(12) "Governmental unit" means the state or any county, municipality, or other political subdivision, or any department, division, board, or other agency of any of the foregoing.

(13) "Hospital" means any establishment that:

(a) Offers services more intensive than those required for room, board, personal services, and general nursing care, and offers facilities and beds for use beyond 24 hours by individuals requiring diagnosis, treatment, or care for illness, injury, deformity, infirmity, abnormality, disease, or pregnancy; and

(b) Regularly makes available at least clinical laboratory services, diagnostic X-ray services, and treatment facilities for surgery or obstetrical care, or other definitive medical treatment of similar extent.

However, the provisions of this chapter do not apply to any institution conducted by or for the

adherents of any well-recognized church or religious denomination that depends exclusively upon prayer or spiritual means to heal, care for, or treat any person. For purposes of local zoning matters, the term "hospital" includes a medical office building located on the same premises as a hospital facility, provided the land on which the medical office building is constructed is zoned for use as a hospital; provided the premises were zoned for hospital purposes on January 1, 1992.

(14) "Hospital bed" means a hospital accommodation which is ready for immediate occupancy, or is capable of being made ready for occupancy within 48 hours, excluding provision of staffing, and which conforms to minimum space, equipment, and furnishings standards as specified by rule of the agency for the provision of services specified in this section to a single patient.

(15) "Initial denial determination" means a determination by a private review agent that the health care services furnished or proposed to be furnished to a patient are inappropriate, not medically necessary, or not reasonable.

(16) "Intensive residential treatment programs for children and adolescents" means a specialty hospital accredited by the Joint Commission on Accreditation of Healthcare Organizations which provides 24-hour care and which has the primary functions of diagnosis and treatment of patients under the age of 18 having psychiatric disorders in order to restore such patients to an optimal level of functioning.

(17) "Licensed facility" means a hospital, ambulatory surgical center, or mobile surgical facility licensed in accordance with this chapter.

(18) "Lifesafety" means the control and prevention of fire and other life-threatening conditions on a premises for the purpose of preserving human life.

(19) "Managing employee" means the administrator or other similarly titled individual who is responsible for the daily operation of the facility.

(20) "Medical staff" means physicians licensed under chapter 458 or chapter 459 with privileges in a licensed facility, as well as other licensed health care practitioners with clinical privileges as approved by a licensed facility's governing board.

(21) "Medically necessary transfer" means a transfer made necessary because the patient is in immediate need of treatment for an emergency medical condition for which the facility lacks service capability or is at service capacity.

(22) "Mobile surgical facility" is a mobile facility in which licensed health care professionals provide elective surgical care under contract with the Department of Corrections or a private correctional facility operating pursuant to chapter 957 and in which inmate patients are admitted to and discharged from said facility within the same working day and are not permitted to stay overnight. However, mobile surgical facilities may only provide health care services to the inmate patients of the Department of Corrections, or inmate patients of a private correctional facility operating pursuant to chapter 957, and not to the general public.

(23) "Person" means any individual, partnership, corporation, association, or governmental unit.

(24) "Premises" means those buildings, beds, and equipment located at the address of the licensed facility and all other buildings, beds, and equipment for the provision of hospital,

ambulatory surgical, or mobile surgical care located in such reasonable proximity to the address of the licensed facility as to appear to the public to be under the dominion and control of the licensee. For any licensee that is a teaching hospital as defined in s. 408.07(44), reasonable proximity includes any buildings, beds, services, programs, and equipment under the dominion and control of the licensee that are located at a site with a main address that is within 1 mile of the main address of the licensed facility; and all such buildings, beds, and equipment may, at the request of a licensee or applicant, be included on the facility license as a single premises.

(25) "Private review agent" means any person or entity which performs utilization review services for third-party payors on a contractual basis for outpatient or inpatient services. However, the term shall not include full-time employees, personnel, or staff of health insurers, health maintenance organizations, or hospitals, or wholly owned subsidiaries thereof or affiliates under common ownership, when performing utilization review for their respective hospitals, health maintenance organizations, or insureds of the same insurance group. For this purpose, health insurers, health maintenance organizations, and hospitals, or wholly owned subsidiaries thereof or affiliates under common ownership, include such entities engaged as administrators of self-insurance as defined in s. 624.031.

(26) "Service capability" means all services offered by the facility where identification of services offered is evidenced by the appearance of the service in a patient's medical record or itemized bill.

(27) "At service capacity" means the temporary inability of a hospital to provide a service which is within the service capability of the hospital, due to maximum use of the service at the time of the request for the service.

(28) "Specialty bed" means a bed, other than a general bed, designated on the face of the hospital license for a dedicated use.

(29) "Specialty hospital" means any facility which meets the provisions of subsection (13), and which regularly makes available either:

(a) The range of medical services offered by general hospitals, but restricted to a defined age or gender group of the population;

(b) A restricted range of services appropriate to the diagnosis, care, and treatment of patients with specific categories of medical or psychiatric illnesses or disorders; or

(c) Intensive residential treatment programs for children and adolescents as defined in subsection (16).

(30) "Stabilized" means, with respect to an emergency medical condition, that no material deterioration of the condition is likely, within reasonable medical probability, to result from the transfer of the patient from a hospital.

(31) "Utilization review" means a system for reviewing the medical necessity or appropriateness in the allocation of health care resources of hospital services given or proposed to be given to a patient or group of patients.

(32) "Utilization review plan" means a description of the policies and procedures governing utilization review activities performed by a private review agent.

(33) "Validation inspection" means an inspection of the premises of a licensed facility by the agency to assess whether a review by an accrediting organization has adequately evaluated the licensed facility according to minimum state standards.