Executive Summary

Recommendation to adopt the June 24, 2008, Collier County Water and Wastewater Master Plan Updates, Projects 700703, 730663, 750071, and 750072.

OBJECTIVE: To address water and wastewater utility projects needed to meet the demand for services relative to population growth, and to stay in regulatory compliance for the next 20 years (through 2027). Projects identified in the master plans include infrastructure capital improvements, rehabilitation, reliability, and planning projects.

CONSIDERATIONS: New water and wastewater facilities are required to meet increased demand for services due to anticipated population growth, and must be suitably sized for economies of scale. Irrigation Quality (IQ) Water system improvements are also recommended to enhance the production and distribution of IQ water from wastewater effluent and other supplemental water sources.

The recommended capital improvements and planning studies are the basis for the determination of proposed changes to the existing water and wastewater impact fees and user rates.

The major difference between the 2008 updates and the 2005 water and wastewater master plans adopted on June 6, 2006, is that due to lower projected population growth numbers provided by the Collier County Comprehensive Planning Department, several capital improvement projects are recommended for postponement in order to remain concurrent with the demand for potable water and wastewater treatment without overbuilding.

These major differences include:

WATER – DIFFERENCES BETWEEN THIS 2008 MASTER PLAN UPDATE AND THE 2005 MASTER PLAN UPDATE:

1) The Northeast Regional Water Treatment Plant (NERWTP) capacity was reduced to 5-Million Gallons per Day (MGD) and postponed to the year 2018.
2) The Southeast Regional Water Treatment Plan (SERWTP) capacity was reduced to 4-MGD and postponed to the year 2022.
3) Water Supply projects for the NERWTP and SERWTP were deferred.
4) Several transmission pipelines were deferred or deleted.

WASTEWATER – DIFFERENCES BETWEEN THIS 2008 MASTER PLAN UPDATE AND THE 2005 MASTER PLAN UPDATE:

1) The 4-MGD Northeast Water Reclamation Facility (NEWRF) was postponed to 2017.
2) The expansion to the NEWRF was deleted.
3) The 4-MGD South East Water Reclamation Facility (SEWRF) was postponed to 2022.
4) The East Central Master Pumping Station (ECMPS) was postponed to 2017.

5) The 30.6-MGD expansion of the North County Water Reclamation Facility (NCWRF) was postponed to 2017.
6) NCWRF Compliance Assurance and Bridge-the-Gap projects were added.
7) IQ Water transmission mains from NEWRF were deferred.

The proposed 2008 Water and Wastewater Master Plan Updates were presented to the Development Services Advisory Committee (DSAC) on June 11, 2008. The DSAC recommended the Board of County Commissioners (BCC) approve the plans.

Copies of the 2008 Water and Wastewater Master Plan Updates, dated June 24, 2008, are available for viewing at the offices of the BCC, the office of the County Manager, the Collier County Public Utilities Engineering Department, and at the Clerk of Court's Office. The Collier County Commissioners were provided with individual copies for their personal review.

FISCAL IMPACT: The 2008 Water and Wastewater Master Plan Updates, dated June 24, 2008, recommend system improvements that will require the allocation of funding for capital and planning projects in future years. Tables 8-1, 8-2, and 8-3 of the Water and Wastewater Master Plan Updates summarize these improvements.

Water and wastewater system capital improvement funding is provided through impact fees, user fees, Allowance for Funds Prudently Invested (AFPI) Fees, long-term bond financing, commercial paper and State Revolving Fund (SRF) Loans. To ensure adequate funding, the impacts of the recommended project expenditures are included in the Impact Fee, User Rate Fee, and AFPI Fee Studies.

LEGAL CONSIDERATIONS: The Potable Water Sub-Element of the Growth Management Plan establishes the necessity for the Water and Wastewater Master Plan Updates which is the primary planning document for the Collier County Water-Sewer District. There are no outstanding legal issues at this time. - JAB

GROWTH MANAGEMENT IMPACT: Per capita potable water and wastewater flows used in the 2008 Water and Wastewater Master Plan Updates are reduced from the current Level of Service Standards (LOSS) in the county's Comprehensive Growth Management Plan as follows:

WATER – LEVEL OF SERVICE - 2005 AND 2008 MASTER PLAN UPDATE COMPARISON:

	Current LOSS	**Recommended 2008 Water Master Plan Update LOSS**
Composite, Gallons Per Capita Per Day	185	170

WASTEWATER – LEVEL OF SERVICE - 2005 AND 2008 MASTER PLAN UPDATE COMPARISON:

	Current LOSS	**Recommended 2008 Wastewater Master Plan Update LOSS**
North Sewer Service Area, Gallons Per Capita Per Day	145	120
South Sewer Service Area, Gallons Per Capita Per Day	100	100
New Sewer Service Areas, Gallons Per Capita Per Day	120	120

This project meets current Growth Management Plan standards to ensure the adequacy and availability of public facilities.

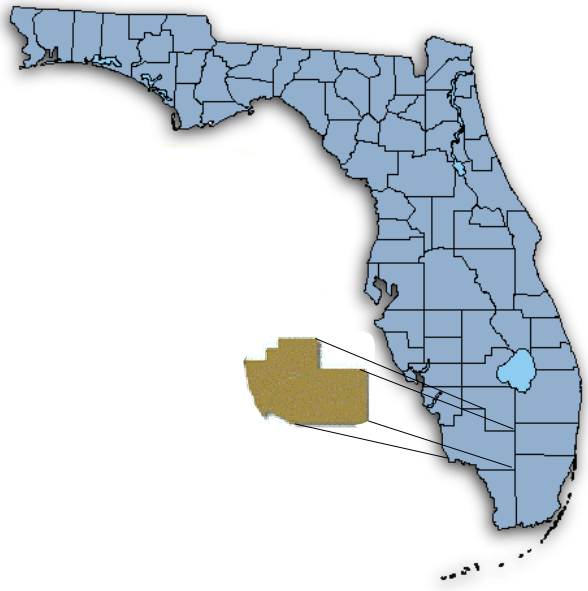
RECOMMENDATION: That the Board of County Commissioners of Collier County, Florida, as the Ex-Officio Governing Board of the Collier County Water-Sewer District, adopt the 2008 Water Master Plan Update, dated June 24, 2008, and the 2008 Wastewater Master Plan Update, dated June 24, 2008.

PREPARED BY: Phil Gramatges, P.E., Interim Director, Public Utilities Engineering Department

Collier County Government
Public Utilities Division

2008 Wastewater Master Plan Update

24 June 2008
Final Report



GREELEY AND HANSEN

2008 Wastewater Master Plan Update

24 June 2008 Final Report

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GLOSSARY OF TERMS

Annual Average Daily Flow (AADF) Total wastewater flow measured in one year divided by the number of days in that year. (Source: 2008 Wasterwater Master Plan Update).

Aquifer Storage and Recovery (ASR) Stormwater, surface water, or reclaimed water is appropriately treated to potable standards and injected into an aquifer through approved Class V injection wells during wet periods with the intent to recover the water for treatment and reuse in the future during dry periods. (Source: South Florida Water Management District (SFWMD), Lower West Coast Water Supply Plan (LWCWSP), 2006).

Asset Management A systematic process of maintaining, upgrading and operating physical assets cost-effectively. It combines engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to both short- and long-range decision-making. (*Asset Management*, Federal Highway Administration, 1996).

Bureau of Economic and Business Research (BEBR) University of Florida, Bureau of Economic and Business Research. (Source: 2008 Wasterwater Master Plan Update).

Collier County Water-Sewer District (CCWSD) An independent special district within Collier County that is defined in the Special Act, Chapter 2003-353, as such Act may be amended, and is governed by the Board of County Commissioners. (Source: Collier County Utilities Ordinance No. 2004-31).

Concurrency The local government comprehensive plan requirement of Section 163.3180, FS, to ensure that public facilities and services needed to support development will be available at the time of the development's demand for such facilities and services. (Source: Section 163.3180, FS).

Effluent Disposal Effluent disposal involves the practice of releasing treated effluent back to the environment using surface water discharges and deep injection wells. (Source: SFWMD, LWCWSP, 2006).

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

Fiscal Year (FY) The Collier County fiscal year begins on October 1 and ends on September 30 the following year.

Florida Administrative Code (FAC) The Florida Administrative Code is the official compilation of the administrative rules and regulations of state agencies.

Florida Statutes (FS) The Florida Statutes are a permanent collection of state laws organized by subject area into a code made up of titles, chapters, parts and sections. The Florida Statutes are updated annually by laws that create, amend or repeal statutory material.

Irrigation Quality Water Water that has received at least secondary treatment and basic disinfection and is reused after treatment by a domestic wastewater treatment facility, or water from surficial aquifer wells that are connected to the irrigation quality water system that meets irrigation quality standards. (Source: Chapter 62-610, FAC).

Irrigation Quality Water Demand The water used for landscape and golf course irrigation. Landscape irrigation includes water used for parks, medians and other irrigation applications not supplied by a public water supply or regional reuse facility. (Source: SFWMD, LWCWSP, 2006).

Level of Service Standard (LOSS) Adopted standards for providing service. For water and wastewater, the level of service standards include peak factors and per capita water demands and wastewater flows.

Lower West Coast Water Supply Plan (LWCWSP) Detailed water supply plan developed by the SFWMD under Section 373.0361, FS, providing an evaluation of available water supply and projected demands for the Caloosahatchee River and Big Cypress Swamp basins. The planning process projects future demand for 20 years and recommends projects to meet identified needs. The current LWCWSP Update is dated 2005-2006. (Source: SFWMD, LWCWSP, 2006).

Maximum Month Daily Flow (MMDF) Maximum quantity of wastewater flow measured during a single month during a one-year period, divided by the number of days in the month. The CCWSD utilizes the MMDF for sizing treatment facilities. (Source: 2008 Wasterwater Master Plan Update).

Peak Hourly Flow (PHF) Maximum quantity of wastewater flow measured in a single hour during a one year period. (Source: 2008 Wasterwater Master Plan Update).

Per Capita Wastewater Flow Total wastewater flow in a given time period divided by the total population served. Usually expressed in gallons per capita per day (gpcd). (Source: 2008 Wasterwater Master Plan Update).

Regional Irrigation Distribution System (RIDS) A plan for an interconnected pipeline system to deliver irrigation quality water, which considers reuse and alternative water supplies, such as supplemental surface water and ASR. (Source: SFWMD, LWCWSP, 2006).

Sewershed A region or area bounded peripherally by a wastewater system that drains to a particular pumping station or treatment facility. (Source: SFWMD, LWCWSP, 2006).

LIST OF COMMON ABBREVIATIONS AND ACRONYMS

AADD	Annual Average Daily Demand
ADD	Average Daily Demand
AMSA	Association of Metropolitan Sewerage Agencies
ASR	Aquifer Storage and Recovery
AUIR	Annual Update and Inventory Report
BEBR	Bureau of Economic and Business Research
BCC	Board of County Commissioners
CCCPD	Collier County Comprehensive Planning Department
CCRPM	Collier County Real Property Management
CCWSD	Collier County Water-Sewer District
CDES	Community Development and Environmental Services
CIE	Capital Improvement Elements
CIP	Capital Improvement Program
CMOM	Capacity, Management, Operation and Maintenance
CRM	Customer Relationship Management
DIW	Deep Injection Well
EAR	Evaluation and Appraisal Report
ERC	Equivalent Residential Connection
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FGUA	Florida Government Utility Authority
FY	Fiscal Year
GASB 34	Governmental Accounting Standards Board Statement 34
GIS	Geographic Information System
gpcd	Gallons per Capita per Day
gpd	Gallons per Day
GPS	Global Positioning System

HPRO	High Pressure Reverse Osmosis
IQ	Irrigation Quality
LDC	Land Development Code
LIMS	Laboratory Information Management System
LOSS	Level of Service Standard
LPRO	Low Pressure Reverse Osmosis
MG	Million Gallons
mg/L	Milligrams per Liter
MGD	Million Gallons Per Day
mL	Milliliters
MMDF	Maximum Month Daily Flow
NCWRF	North County Water Reclamation Facility
NEWRF	Northeast Water Reclamation Facility
O&M	Operation and Maintenance
PRB	Project Review Board
PUD	Public Utilities Division
RFP	Request for Proposal
RIDS	Regional Irrigation Distribution System
RO	Reverse Osmosis
SA	Service Area
SAP	Systems Application Project
SCADA	Supervisory Control and Data Acquisition
SCWRF	South County Water Reclamation Facility
SEWRF	Southeast Water Reclamation Facility
SFWMD	South Florida Water Management District
SOP	Standard Operating Procedure
SRF	State Revolving Fund
TAZ	Traffic Analysis Zones
USEPA	United States Environmental Protection Agency
WRF	Water Reclamation Facility
WTP	Water Treatment Plant
WUP	Water Use Permit

COLLIER COUNTY GOVERNMENT
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2008 Wastewater Master Plan Update

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1 Executive Summary

1.1 Introduction

The Collier County Board of County Commissioners (BCC) has identified *Growth Management* as one of their six strategic focus areas in the in the 10-Year Strategic Plan. The Collier County Water-Sewer District (CCWSD) has developed operational and tactical business plans nested and aligned with the BCC strategic plan. The CCWSD has identified strategic elements of the Growth Management Plan, the Annual Update and Inventory Report, and the Land Development Code; together with regulatory compliance obligations and BCC-directed Levels of Service to develop this Wastewater Master Plan Update. Given the nature and time required to develop wastewater capacity infrastructure, the CCWSD has adaptively looked beyond this 10-year period. Having a vision of the CCWSD mission in the next 20-year time frame enables planning for optimum best value solutions.

Since the last master plan was prepared in 2005, there has been a significant reduction in the rate of population growth. As discussed in Section 8, many projects have been deferred to reflect the recent slowdown in growth. If the population growth rates increase, the CCWSD will need to react to accelerate the projects that have been deferred.

Master planning is especially critical for utilities projects because expenditures of capital to develop a new facility need to occur several years before the new facility is placed in service. A typical schedule for construction of a new water reclamation facility is about eight years from initial planning to completion of construction, including three years for conceptual design, siting and land acquisition; two years for preliminary and final design and permitting; and three years for bidding and construction. Therefore, expenditures of capital to develop a new facility need to occur several years before the new facility is placed in service. The Wastewater Master Plan Update serves as a framework for planning.

In the preparation of the 2008 Wastewater Master Plan Update, the results of several other past and ongoing reports have been considered and incorporated. These reports address specific issues regarding the treatment facilities, biosolids, and reclaimed water. Since the preparation of the 2005 Wastewater Master Plan Update, revised population projections have been prepared based on updated Collier County Comprehensive Planning Department (CCCPD) and University of Florida

Bureau of Economic and Business Research (BEBR) forecasts. With the utilization of these forecasts, the level of service and infrastructure needs have been reaffirmed.

The 2008 Wastewater Master Plan Update continues to reflect the focus on system reliability contained in the previous update and also includes discussion of the CCCPD concurrency management system, levels of service, infrastructure needs and the CCWSD mission. As part of its planning efforts, the CCWSD is continuously refining the existing concurrency process to help manage growth and assure adequate facilities are in place concurrently with new development. The concurrency system will be used by the CCWSD to implement its planning objectives and direct funding to support desired growth patterns. The components of the concurrency system include the current Master Plan Update, the Annual Update and Inventory Report (AUIR), the Potable Water Sub-Element and Capital Improvement Element (CIE) of the Growth Management Plan, and the Evaluation and Appraisal Report (EAR)/Water Supply Facilities Work Plan.

The 2008 Wastewater Master Plan Update consists of nine sections as follows:

Section 1, Executive Summary, provides an overview of the information and recommendations developed in the other sections.

Section 2, Introduction, provides a description of the goals and scope of this update.

Section 3, Wastewater Service Areas, describes the included service areas.

Section 4, Existing Facilities, describes the existing wastewater collection, treatment, effluent disposal, and biosolids handling facilities.

Section 5, Population and Demand Projections, provides a basis for which the need for future facilities was evaluated.

Section 6, Concurrency Management and System Reliability, addresses pertinent concurrency and reliability issues.

Section 7, Alternative Wastewater Service Plans, provides an evaluation of the alternative wastewater treatment and disposal facilities required to meet the wastewater demands for at least the next 20 years.

Section 8, Capital Improvement Program for Wastewater, summarizes project costs needed to implement the recommended wastewater program.

Section 9, Summary and Recommendations, provides a summary and recommendations of this 2008 Wastewater Master Plan Update.

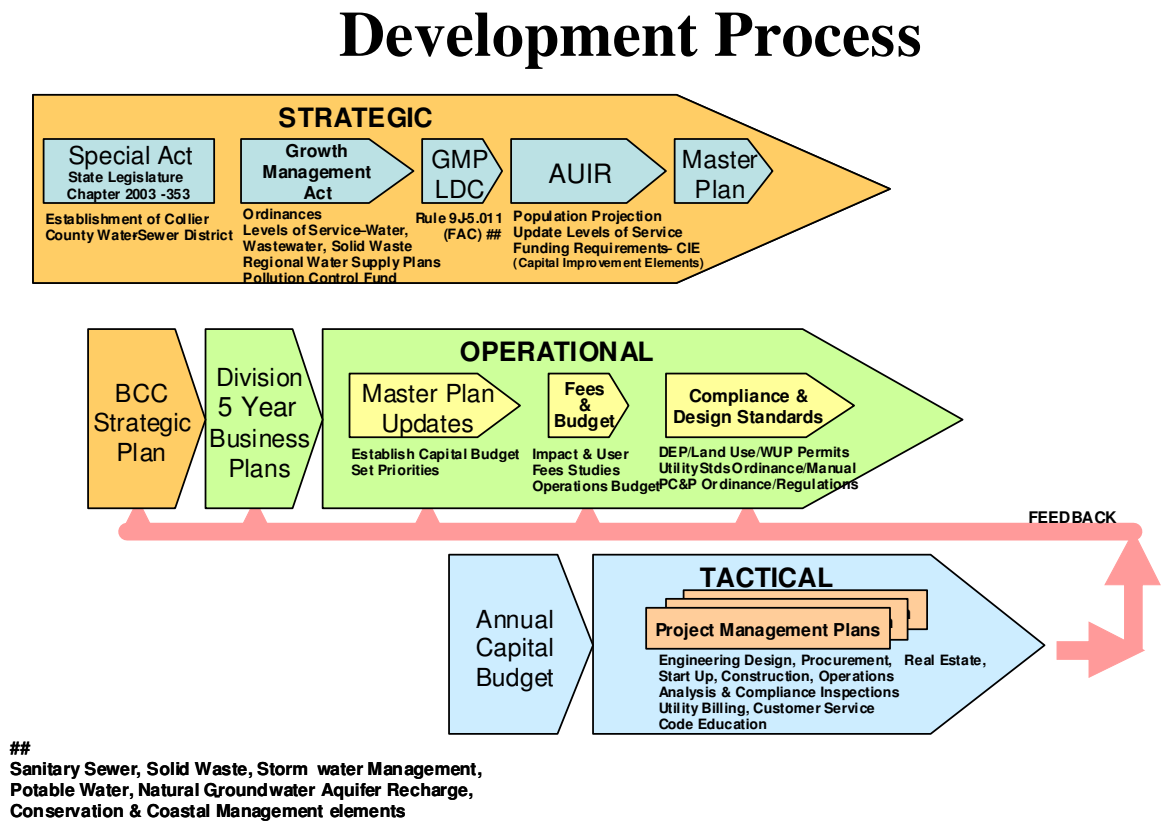
1.2 Seeing the Future

The wastewater service demands of the current and next generation of CCWSD customers are outlined within this Wastewater Master Plan Update. The CCWSD's contribution to *Manage Community Growth*, a key outcome of the BCC 10-Year

Strategic Plan, is reliant on successful development of integrated and comprehensive business plans that deliver proven compliance and customer-focused results. In planning future wastewater treatment facilities and infrastructure expansion and modernization, the CCWSD empowers an adaptive management decision making process.

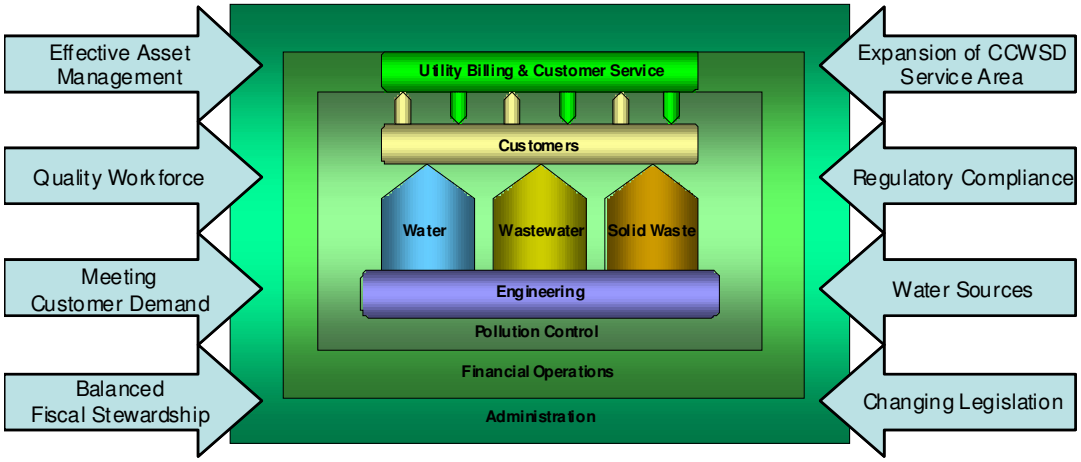
1.2.1 Guiding Principles for an Integrated Business Plan

Below is an illustration of the CCWSD Development Process. This process includes elements of the Growth Management Plan; Annual Update Inventory Report; Land Development Code; legislative, regulatory compliance obligations; and BCC-directed Levels of Service. The BCC 10-Year Strategic Plan provides direction for CCWSD's Five Year Operational Plan. During the operational stage, business process determinants are evaluated and incorporated as Master Plan Updates; fees and budget adjustments; and design standards. The final tactical stage, dependent on the approval of the CCWSD annual capital and operational budgets, provides the delivery of project management plans and resultant utility services.



A Wastewater Master Plan outlines the optimal, best value path to provide reliable and sustainable wastewater services treatment and collection facilities. Awareness and responsiveness to sociological, political, economic and environmental influences are essential business process fundamentals and determinants. The CCWSD responds to these business process fundamentals and determinants through a flexible and agile business strategy that adaptively responds to changing business

dynamics. This adaptive strategy is the foundation for the CCWSD mission capabilities to deliver best value, high quality and sustainable services that meet customer expectations in an operationally excellent environment.



Key Business Process Determinants

Regulatory Compliance
Water Sources
Balanced Fiscal Stewardship

1.2.2 Regulatory Compliance

Compliance is the primary business process determinant for the CCWSD. The bulk of water resource and services regulations are the result of a perceived threat to public health and safety, or actions to provide environmental protection. As these regulatory requirements constitute essentially an unfunded mandate, utilities must align financial and infrastructure priorities to meet current and emerging regulatory requirements. Compliance requirements affect all the CCWSD business processes; there are contracting requirements, reporting requirements, public outreach and education expectations, and a myriad of other statutory and policy driven requirements that must be addressed daily in the CCWSD business processes. The CCWSD ceaselessly and compromisingly plans, budgets, and operationally focuses on 100 percent compliance.

The CCWSD proactively shapes and embraces emerging environmental protection and regulation requirements by sustaining positive relationships with numerous regulatory agencies, consultant scientists, and environmental interests. Each of these organizations has different interests, but demand results and answers from the CCWSD that reflect optimal compliance driven applied science and engineering processes.

Continuously operating within the network of compliance regulation, the CCWSD recognizes and aggressively pursues solutions to potential compliance issues by continuously monitoring and upgrading physical assets, contingency and long range planning, and monitoring the dynamic regulatory environment.

The CCWSD maintains a robust and effective odor control program by balancing monitoring, operational controls, chemical additives, biofilters and chemical scrubbers to achieve its "zero-tolerance" goals. This is further complemented through a "no spills" commitment in the collections infrastructure and treatment facilities. Having strategically laid the groundwork for these programs, the CCWSD is confident that it has the knowledge and resources ready to prevent odor and spill issues, and to respond quickly and effectively to any concerns should they arise.

In 2007, the Florida Department of Environmental Protection (FDEP) informed the Collier County Wastewater Department that it would be required to develop and implement an industrial pretreatment program. A development and implementation schedule was placed on the FDEP wastewater facility operating permit. The CCWSD operates a comprehensive industrial pretreatment program providing for disposal specifications and standards in addition to site inspections to facilitate the removal of fats, oils, and grease before they enter the wastewater stream. This pretreatment program optimizes plant performance, extends the life of operating equipment, and ensures that the CCWSD operates within compliance parameters.

1.2.3 Managing Resources

The CCWSD intent is to optimize resources to achieve best value for its customers. Resources are identified as people, time, money, infrastructure and relationships. Management of these resources must be integrated into the business plans that define the execution of the CCWSD mission.

Future south Florida wastewater treatment management concerns are generating "regionalization" as utilities proactively seek to work more closely together to solve problems. Biosolids generated by the CCWSD are currently being dispersed on a regional basis. The CCWSD is working to achieve ISO14002 registration in the Biosolids Management area of the Wastewater Department. The current south Florida Lower West Coast Water Supply Plan (LWCWSP) addresses regional irrigation systems, surface water availability, aquifer storage and recovery, supply, demand, and resources for the future.

The construction of Aquifer Storage and Recovery (ASR) wells to store surplus Irrigation Quality (IQ) water during the wet season is an essential strategic element of the CCWSD's potable water conservation policy. FDEP requires that utilities use IQ water as their primary disposal process.

In today's world, change is inevitable and unrelenting and utility team members at every level need to be committed not only to ensuring the quality and reliability of services in an increasingly compliance-focused climate, but also to achieving multiple additional goals. These goals include responding to customer needs, controlling costs, operating efficiently, exploring new technology and processes, and

maintaining the integrity of the utility facilities. Technical expertise continues to be developed so that CCWSD's team of highly skilled project managers and operators expand their competence and capabilities continually to achieve mission focused, compliant, operating efficiencies.

The CCWSD has demonstrated over recent years a developing maturity and continuously improving effectiveness. This is exemplified in the CCWSD's commitment to a continuing "good neighbor" policy at all plant facilities and other above ground appurtenances. Through strong leadership, and a professional approach and commitment, the CCWSD has a dedicated team that has achieved public recognition at national, state and regional levels.

The CCWSD incorporates analytical and technical systems to provide the information needed to properly maintain infrastructure. Constructing, maintaining, and protecting infrastructure will always be a primary concern of any utility. Effective asset management recognizes that the cost of replacing this infrastructure is escalating and continuous systematic analysis of operations and maintenance will be required to keep it in good condition; however, the driving criteria are reliability and life-cycle cost-effectiveness in providing a satisfactory level of customer service for the long term. Managers are integrating good decision processes and tools as a core competency within public utilities, thus there is a dramatic increase in the visibility and control of the business processes.

Technology is also a key means to providing security measures for all facilities, both manned and unmanned, to address requirements of the Homeland Security Department's assessment of the threat to wastewater infrastructure.

1.2.4 Balanced Fiscal Stewardship

The 20-Year Financial Model developed by the CCWSD that outlines the future financial and infrastructure requirements, considering acquisition, real property and project management strategies, will similarly be revised to reflect Master Plan changes. Analysis by the CCWSD will ensure that Water and Wastewater Impact Fee and User Rate Studies are prepared and presented to the BCC. These and the operational performance of the CCWSD provide the basis for success in obtaining funding sources to provide required infrastructure, programs and services.

The CCWSD recognizes the importance of engaging with its customers and has developed numerous outreach programs utilizing the government television channel, school presentations, facility tours, project specific newsletters and stakeholder meetings, proactive media relations, good news articles, etc. These programs encourage the wise use of all natural resources and raise customer awareness of the critical importance of water conservation. The CCWSD also seeks out customer opinions on issues as diverse as water quality and locating new facilities. Neighborhood meetings are regularly conducted to engage residents as stakeholders in the information exchange process, generating support for the services that the CCWSD provides. The CCWSD evaluates customer calls received by the Customer Service Center, whether normal service calls or complaints, as a means of

determining how improvements can be made to the communication outreach and education programs.

1.3 Wastewater Service Areas

The CCWSD provides wastewater service within the Water-Sewer District boundary, which has been established and adopted by the BCC in accordance with Florida State Statute 153.53 entitled "Establishment of Districts in Unincorporated Areas." The Water-Sewer District boundary was expanded to its current boundary by a Special Act, approved by the Governor on June 26, 2003, and adopted as Chapter 2003-353, Laws of Florida. The Rural Fringe Areas were incorporated within the CCWSD when the BCC approved Resolution 2003-296 on September 17, 2003. Any developments occurring within the CCWSD boundary will be customers of the CCWSD.

As shown on Figure 1-1, the current Water-Sewer District boundary area is bounded on the north by Lee County, on the south by the Marco Island Service Area, on the west by the City of Naples Service Area and the Gulf of Mexico, and on the east by the Urban Planning Boundary. Within the Water-Sewer District boundary, the Wastewater Service Area does not include those areas within the County currently served by the City of Naples, the Florida Government Utility Authority, or Orangetree. The Wastewater Service Area is currently divided into the North Service Area and the South Service Area.

1.4 Existing Facilities

1.4.1 General

Wastewater service in the North and South Service Areas is provided by a network of gravity sewers, pumping stations, force mains, and water reclamation facilities. Many parts of the force main system are manifolded, in that several pumping stations feed into a common force main. There are a total of approximately 748 pumping stations, of which 22 are master pumping stations, serving the North and South Service Areas. Currently, wastewater is treated at the North County Water Reclamation Facility (NCWRF) and the South County Water Reclamation Facility (SCWRF).

1.4.2 North County Water Reclamation Facility

Wastewater treatment in the North Service Area is provided at the NCWRF located on the east side of Goodlette-Frank Road just south of Immokalee Road. The present permitted capacity of the NCWRF is 24.1 MGD MMDF. The primary means of effluent disposal is by distribution of irrigation quality water to customers for irrigation.

The next facility expansion, which will add 6.5 MGD MMDF for a total plant capacity of 30.6 MGD MMDF, is scheduled to be in service by 2017.

1.4.3 South County Water Reclamation Facility

Wastewater treatment in the South Service Area is provided at the SCWRF located approximately one mile south of Rattlesnake Hammock Road and ¾ mile east of US 41. The present permitted capacity of the SCWRF is 16.0 MGD MMDF, which is the ultimate capacity of this plant. The primary means of effluent disposal is by distribution of irrigation quality water to customers for irrigation.

1.4.4 Effluent Disposal Facilities

Collier County operates the largest irrigation quality water system in South Florida. Irrigation quality water produced at the NCWRF and the SCWRF is used for irrigation by residential and commercial/recreation (primarily golf course) customers and to mitigate a wetland area. An Irrigation Quality Water Master Plan that will provide recommendations for that system is currently underway. The irrigation quality water system is interconnected to allow transfer of flows for disposal of effluent in either the North or South Service Areas.

The County is pursuing irrigation quality water aquifer storage and recovery near the Livingston Road Wellfield. The purpose of the irrigation quality water ASR wells is to store excess irrigation quality water in the wet season for use during the dry season to help protect and preserve the fresh and potable water supply. The irrigation quality water is stored in a deep brackish water aquifer system that is isolated from the freshwater aquifers that are several hundred feet above. There are hundreds of feet of confining clays and other strata separating the brackish aquifer from the fresh water aquifer. In addition, all stored water is pretreated to meet primary drinking water standards and will be monitored by a comprehensive system.

On October 21, 2003, the FDEP issued a permit to construct an aquifer storage and recovery (ASR) well. The CCWSD constructed one irrigation quality ASR well in 2006 with completion and cycle testing scheduled for 2008. A total of five irrigation quality water ASR wells are planned. Each ASR well will be able to receive or deliver up to 1.0 MGD of irrigation quality water. This project will enhance the CCWSD ability to store irrigation quality water rather than to dispose of it by deep well injection during periods of high wastewater flows and low irrigation demands.

1.4.5 Biosolids Handling

Biosolids are currently dewatered and trucked out of the CCWSD for disposal at a landfill. Biosolids at the NCWRF and the SCWRF are dewatered using belt filter presses.

1.5 Population and Flow Projections

1.5.1 Population Projections

In the 2005 Wastewater Master Plan Update, population estimates were provided by CCCPD based on BEBR High Projections through 2015 and BEBR Average projections thereafter. For the 2008 Wastewater Master Plan Update, populations have also been provided by CCCPD through 2029 and are based on BEBR Medium

Range Growth projections through 2029. The August 2007 population projections provided by CCCPD were updated based on the BEBR "Projections of Florida Population by County, 2007-2035," Bulletin 150, released in March 2008.

1.5.2 Service Areas

The current Water-Sewer District boundary area is shown on Figure 1-1. The Wastewater Service Area does not include those areas within the CCWSD currently served by the City of Naples, the Florida Government Utility Authority (FGUA), or Orangetree. The Wastewater Service Area is divided into the North Service Area and the South Service Area.

Potential future service areas, also shown on Figure 1-1, include all of the area within the Wastewater Service Area not currently served by the CCWSD with the exception of Golden Gate Estates and the areas served by FGUA. It is currently not anticipated that the CCWSD will serve Golden Gate Estates or take over the FGUA Service Area. These future service areas include the Orangetree Area (scheduled to become part of the Water-Sewer District in 2012) and other partially developed or undeveloped areas within the Water-Sewer District.

1.5.3 Total Potential Service Area Populations

Estimates of population for wastewater customers have been developed to establish expected service levels. These estimates were based on information provided by CCCPD in August 2007. The existing and future Water-Sewer District populations in five-year increments are shown in the following chart.

Chart 1-1
Estimated Total Sewered and Unsewered Populations
Within the County Water-Sewer District (1)

Service Area	Year					
	2008	2010	2015	2020	2025	2027
Existing Water-Sewer District	179,600	194,300	228,200	259,600	287,700	298,200
Orangetree	5,200	7,100	11,500	14,600	14,600	14,600
Totals	184,800	201,400	239,700	274,200	302,300	312.800
(1) Source: CCCPD population estimates and projections dated 10 Aug 2007 updated based on BEBR Bulletin 150 dated March 2008.						

These values represent the projected total populations within the service areas, without regard to sewer service. Several areas could remain on septic tank service.

These estimates of population are used in Section 7 to develop wastewater flows for specific alternatives.

It is recommended that this estimate be used for planning purposes. Development of population projections is discussed in Section 5. The CCWSD should periodically review service area populations to determine if the population projection approach is being maintained.

1.5.4 Level of Service Standards

The Level of Service Standard (LOSS) includes operational standards and per capita wastewater flow standards as shown and described in Section 5. The current per capita LOSS's are 145 gallons per capita per day (gpcd) in the North Service Area, 100 gpcd in the South Service Area and 120 gpcd in new areas not currently served by the NCWRF and SCWRF (formerly referred to as the Rural Fringe Areas). It is recommended to change the North Service Area LOSS from 145 gpcd to 120 gpcd based on recent measured changes in wastewater flow.

1.5.5 Wastewater Flow Projections

Annual average daily flows (AADF) for wastewater are estimated based on adopted per capita wastewater level of service standards and population. The wastewater flow projections for the CCWSD are shown in Section 5. Water reclamation facilities are sized based on maximum month daily flow (MMDF), which is 1.3 times the AADF. The total projected MMDF is 45.1 MGD in 2027.

1.6 Concurrency Management and System Reliability

1.6.1 Concurrency

Per the Growth Management Plan (GMP), the CCWSD is required to maintain a concurrency management system. There are various reporting requirements to various regulatory agencies regarding concurrency. A cornerstone of the concurrency process is the latest Wastewater Master Plan Update, which contains the analyses and recommendations for capacity and reliability improvements. The following is a summary of the components of the concurrency process and the frequency of updates. Each of these components is described in Section 6.

Chart 1-2
Concurrency Components (1)

Concurrency Element	Frequency of Update
Annual Update and Inventory Report	Annually
Sanitary Sewer Sub-Element and Capital Improvements Elements of Growth Management Plan	Every Seven Years, or annually as needed
Evaluation and Appraisal Report	Every Seven Years
(1) Source: Collier County Community Development and Environmental Services	

1.6.2 Sustainability and Reliability

Two important concepts associated with utility management are reliability and sustainability. With respect to utility management, "reliability" refers to the provision of infrastructure required to serve customers dependably without interruption of service. A well-managed utility must therefore provide sufficient treatment, transmission, and collection facilities beyond the minimum required to meet capacity. The CCWSD has established reliability standards which are included in Section 6. "Sustainability" refers to the resources required to support the utility. Sustainability refers to staffing, financial, and information management resources required to operate an efficient and effective utility.

Wastewater customers expect a high level of service in exchange for the rates that are paid. For most rate-payers, reliable service will mean invisible service. This is service without disruption, odor problems or operating problems such as noise, and in full compliance with all requirements for the protection of public health. The CCWSD utility enterprises need to efficiently provide service to customers at rates that most citizens will consider being reasonable and shared equitably. An equitable system is one is which the customer pays in proportion to the benefit received ("he who pays benefits" and "he who benefits pays").

1.6.3 Areas of Utility Management

1.6.3.1 Water Reclamation Facilities

Treatment facilities constructed to serve irrigation quality water systems must be designed to meet Class I Reliability for process, electrical, and electrical systems in accordance with FDEP regulations. Class I is the highest reliability standard. All CCWSD plants must meet these regulatory standards when obtaining an operating permit. In addition, all treatment facilities must comply with CCWSD reliability standards.

An Asset Management Program is ongoing. An Asset Management Charter and technical memorandums have been prepared. A Project Summary of Accomplishments is included as Appendix A. This will allow the CCWSD to develop a comprehensive inventory and plan for system component rehabilitation in a timely manner, as well as allow for cost-effective acquisition, use and retirement of assets.

1.6.3.2 Disaster Preparedness

Responsible management of a utility includes taking the required steps to maintain a continuity of operations during emergency conditions. Emergency response plans are in place for the plants as required by State regulations. The plans detail the response protocol for various emergencies, such as chemical spills, wastewater overflows, and hurricanes. Many of the previously discussed objectives of the CCWSD for maintaining a reliable utility will also contribute to the utility's sustainability during potential disasters. Interconnections, back-up power facilities, reliability treatment trains, and adequate well-trained staffing will increase the flexibility of a utility and minimize service disruptions due to uncontrollable circumstances.

Emergency response plans are in place for the plants as required by Local, State, and Federal regulations. The plans detail the response protocol for various emergencies, such as broken mains, equipment failure, and hurricanes. It is vital that the CCWSD actively participate in emergency preparedness, especially hurricane preparation. The CCWSD and each individual Department maintains and keeps updated a hurricane response plan. CCWSD facilities are vulnerable to damage from high winds, tidal surge and heavy precipitation.

The 2007 Public Utilities Emergency Department's Hurricane Plan addresses preparatory actions required for Hurricane Alert Planning (Level I – 36 or more hours in advance). Hurricane Watch Action Plan (Level II – 24 to 36 hrs.), Hurricane Warning Action Plan (Level III – 12 – 24 hrs.) during the Hurricane (Level IV), Hurricane Aftermath (Level V). These plans must be kept up to date and enhanced on the basis of lessons learned.

1.6.3.3 Collection and Transmission Systems

The CCWSD current practice of coordination and planning for new replacement force mains with roadway improvements to minimize public inconvenience and cost of restoration should be continued. Acquisition of real estate may be required during this process.

A structure is being developed to lead to more accurate and available record drawing information. The structure includes the following:

- Identifying the location of existing key system features using GPS (in progress).
- Identifying dates of installation and improvements.
- Preparing a mapping system similar to that currently utilized by the CCWSD that would be available to all personnel using GIS (in progress).

- Maintaining wet-weather disposal capacity commensurate with treatment plant expansions through added deep injection wells (DIWs) when required.

1.6.3.4 Effluent Management

The CCWSD relies on irrigation with irrigation quality water (formerly termed "reclaimed water") as the primary effluent management approach and is required to do so by permit. The North and South service areas have been interconnected. A new irrigation quality pumping station has been designed to increase flow transfers between the North and South Areas.

The NCWRF is designed, permitted and operated to stay in compliance and to meet all wastewater treatment standards and effluent disposal. There has been increased demand for irrigation quality water with more focus on consistently meeting irrigation quality water demand with reliability in an efficient and effective manner. Each plant process needs to be evaluated independently to provide necessary reliability with regard to production of irrigation quality water. Upgrades to existing plant processes to meet demand and sustain irrigation quality production that meets compliance criteria also need to be incorporated into the design of future CCWSD water reclamation facilities.

The CCWSD has installed deep injection wells (DIWs) at the NCWRF and SCWRF. The well capacity allows the plants to dispose of the maximum month treatment capacity at each plant in accordance with FDEP permit requirements. Two wells are provided at each plant for 100-percent reliability. The CCWSD should plan to use this pattern for the future NEWRF and SEWRF plants.

An Irrigation Quality Master Plan is being prepared and will be completed in 2008.

1.6.3.5 Information Management

Information management requires a vision with clear goals, a strategy for implementation and control (management) of the data collected.

There are many new information management technologies available to advance and modernize the support and operation of the water and wastewater systems. The three key areas where technology is used in water and wastewater systems are supporting the existing infrastructure, system operations and customer metering and billing. The CCWSD is at the forefront of new technology in all three of these areas with the use of fiber communications, GIS, LIMS, SCADA and automatic meter reading. Continued investment in these areas will improve the system reliability, particularly with the advancement of the Asset Management program and pressures to optimize staff levels. A coordinated program approach will be required to ensure that system security is maintained and advancement of these technologies is on a converging path.

Improvements have been made within the Utility Billing and Customer Service areas through the implementation of InHance Utility Information Management System and Special Assessment System. These information management systems

are significant improvements in the customer account, meter maintenance, and work order management areas.

The SCADA system provides the CCWSD with a useful tool for system-wide communications and management. SCADA can provide the CCWSD with total asset visibility and trending. Expansion of the SCADA system may require real estate acquisition.

The CCWSD has been expanding the telemetry program, which expands capabilities and provides a real-time, reliable and efficient means of data acquisition. Real-time information is available from telemetry systems associated with pumping stations. Real-time and laboratory data is also available from the treatment facilities. These processes allow the data to be available in such a way as to be used not only as a historical record, but also as monitoring, control and forecasting tools.

The Countywide goal of in-house data communication is to obtain a reliable and resilient system. An optical fiber cable network is the most resilient means of signal transmission and this system provides a high capacity. Reliability of the system is provided by the existing radio-telemetry system. Fiber will be the primary mode of signal transmission. Installation of the fiber network is ongoing and is being managed by the IT Department. Other County Departments are sharing the network system.

1.6.3.6 Financial Sustainability

Financial sustainability is the backbone of responsible utility management, and is the "fuel" for system improvements. The utility must be able to manage capital assets, incur and pay off debt, and have an equitable means of collecting revenue and covering day-to-day expenses.

As Master Plans are updated, the appropriate fee studies will be conducted to assess the financial impact. The Collier County Consolidated Impact Fee Ordinance No. 2001-13, as amended, requires the CCWSD to review the capital plan and to conduct an Impact Fee study every three years at a minimum. Impact fees will be reviewed every three years or more frequently during periods of changes in growth patterns. During years that Impact Fee studies are required, a determination will be made whether or not a master plan update is required.

The CCWSD has adequate means and methods in place to monitor the financial feasibility of the various projects proposed in this Master Plan Update. Some of these methods include performing the rate studies and impact fee conditions, testing the reasonableness of the projects' viability through a ten-year financial model and monthly monitoring of the continuous need and progress of the projects in the Project Review Board (PRB) meetings. In addition, cash-flow needs are monitored monthly.

Asset management is important to a utility to maximize assets while minimizing the costs required to reliably meet customer needs. Through an asset management program the use of operational resources are improved and the utility is better able

to forecast future expenses and provide optimal planning of capital for the benefit of the customers. The CCWSD has implemented the Antero maintenance software as a tool for asset management. This and other tools of the asset management system will facilitate the means for the CCWSD to collect data to meet Governmental Accounting Standards Board Statement 34 (GASB 34) requirements.

It is anticipated that the ongoing asset management program will optimize O&M and capital expenditures, thus facilitating the best allocation of financial resources. An effective asset management system will facilitate the utility's ability to set user rates that contemplate replacing the existing infrastructure based on expected useful life. This will facilitate avoidance of the potential for "rate spikes" due to unforeseen equipment breakdowns requiring high levels of uneven expenditures.

The asset management program will allow the CCWSD to take advantages of recapitalization of assets to increase the overall value of assets compared to a straight-line depreciation method. For instance, the pumping station improvements that the CCWSD is pursuing over time could be used in the asset management program to increase the overall value of assets on a systematic basis.

1.6.3.7 Planning

The Master Plans for each of the CCWSD utilities are an encapsulation of plans and capital improvements that meet growth and fund replacement and reliability programs through the 20-year horizon. Within one-year's time, growth estimates change, service areas change, service agreements change, and operating parameters change.

Growth Management Plan elements pertaining to utilities, including the Sanitary Sewer Sub-element and the associated projects in the Capital Improvement Element, will be revised every seven years. The next required Growth Management Plan update will be in 2014.

An asset alignment plan is included in the Capital Improvement Program to ensure that assets are properly aligned with divisional functions. The goals of the project are to check that plans and mapping for existing facilities are accurate, that facilities outside of existing rights-of-way are properly located within easements and all wastewater, water and IQ flows are properly billed. In the future, this may merge with the Asset Management Program.

1.6.4 Measures for Reliability

The following measures will contribute to continued reliable utility operation:

- Refine the existing Concurrency Management System to assist in reviewing system capacity.
- Application of Geographic Information System (GIS) and Supervisory Control and Data Acquisition (SCADA) systems designed to measure system reliability over time and to assist in developing strategies for improved and optimal reliability.

- Transformation from radio communication to fiber system.
- Periodic documentation and review of customer complaints.
- Maintenance Work Order history.
- Continued compliance with permit limitations to assure environmental protection and protect public health.
- Implementation of an effective Industrial Pretreatment Program to limit discharge from potentially harmful sources.
- Conservation of resources by providing a means of long-term storage of irrigation quality (IQ) water during wet periods to maximize the use of IQ water thereby reducing the use of potable water for irrigation purposes.
- Include reliability in project charters.
- Incorporate reliability as a part of design.
- Annual update of Utilities Standards.
- Annual update of Land Development Code (LDC).
- Annual Security Inspections.

1.7 Alternative Wastewater Service Plans

1.7.1 Development of Alternative Projects

Wastewater service in Collier County will potentially be required in the following areas:

- Expanded development within existing sewered areas.
- Existing developments currently with on-site septic systems (outside of Golden Gate Estates).
- New developments within the North and South Service Areas of sufficient density to require sewer service.
- The Orangetree area. (The CCWSD currently has an agreement to take over service of the Orangetree area in 2012.)
- Potential bulk wastewater sales to other utilities.

The capacity of the existing treatment facilities and the ability of the existing plant sites to provide additional capacity will not be sufficient in the future. Additional plant sites will be necessary. The recommended alternative is to provide four regional wastewater treatment facilities, including the existing NCWRF and SCWRF, and a master pumping station with pretreatment facilities in the East Central Rural Fringe Area to direct flow to the NCWRF.

The dates in which the expansions of the existing facilities and the initial construction and subsequent expansions of the new facilities would need to be placed in service is summarized in Chart 1-3. As discussed in greater detail in Section 7, the time required to construct a new water reclamation facility is eight years. The NEWRF design for 4.0 MGD MMDF will be completed in 2008.

Chart 1-3
Estimated In-Service Dates for the Recommended Alternative (1)

Plant	Constructed Capacity – Initial Construction/Expansion (MGD - MMDF)	Date to Be Placed in Service	Total Facility Capacity (MGD – MMDF)
NCWRF	6.5 – Expansion	2017	30.6
NEWRF	4.0 – Initial Construction	2017	4.0
SEWRF	4.0 – Initial Construction	2022	4.0
	2.0 – Expansion	2026	6.0
(1) Source: 2008 Wastewater Master Plan Update Section 7.			

Future water reclamation facilities to serve the CCWSD are shown on Figure 7-1.

1.7.2 Summary of Other Wastewater Issues

1.7.2.1 Service to Existing Areas Served by Septic Tanks

Estimates of future population in currently unsewered areas are presented in the 2008 Master Plan Update; however, estimates of costs for collection systems to serve these areas are not included. Unless adverse environmental or public health impacts are demonstrated to exist, septic systems in some areas of the County can be a viable wastewater disposal method over the long term.

1.7.2.2 Force Mains and Pumping Stations

There are a total of approximately 748 pumping stations serving the North and South Service Areas. The network of pumping stations and force mains was modeled for present and future conditions.

1.7.2.3 Timing Milestones

The 2008 Wastewater Master Plan Update covers the period from 2008 through 2027. Within this report, projections of when certain populations or wastewater flows may occur have been identified in certain years. Regarding timing, it is not so much the dates that are important, but rather milestones. When certain wastewater flows occur, the CCWSD will need to provide facilities consistent with the strategy presented in the 2008 Wastewater Master Plan Update. For example, certain force mains are proposed to interconnect systems. The timing for such interconnections may be triggered by road construction projects, as much as by a need for the pipeline to meet an immediate collection or transmission system demand. This document is intended to be a flexible plan that can be accelerated if population growth increases.

Many growth-related projects, such as the NEWRF, have been deferred due to recent slowdown in population growth. If the population growth rates increase, the

CCWSD needs to be in a good position to accelerate these projects, if required. For example, the NEWRF is currently shown to come on-line in 2017. The schedule for completion of this project could easily be accelerated by up to four years if the rate of growth increases. The next required treatment capacity to serve future growth will be the expansion of the NCWRF and the new NEWRF. If populations begin to increase faster than currently projected, the CCWSD already has a Northeast Program Manager in place and will have signed and sealed plans and specifications by December 2008 for the NEWRF design. The plans may need to be updated. The Northeast Program Manager will develop a "Hibernation" plan by December 2008 for the Northeast Program projects to document the suspension point in the development process. The "hibernation" plan will also include a reactivation schedule describing the activities required to restart the development process of these facilities. The design for the expansion of the NCWRF to 30.6 MGD and the design for the NEWRF both need to be completed far enough in advance to allow for a three-year construction period. The required capacity and growth rates will be monitored through the AUIR process.

The timing for new treatment facilities to serve areas of the Water-Sewer District will be triggered by the demand of growth and development. Plants in the new areas will need to be constructed only as required to serve new development. The timing of expansion of existing plants needs to be consistent with FDEP requirements as described in Section 7.

1.8 Conclusions

The vision for management of wastewater in the CCWSD is established in this 2008 Wastewater Master Plan Update. Elements of the recommended plan are listed in Section 9 of the Master Plan report.

1. Wastewater Treatment

FY 2008-2013:

- Complete final design, permitting and construction of the Compliance Assurance project at the NCWRF (2011).
- Complete final design, permitting and start construction of the Bridge-the-Gap project.
- Complete irrigation quality water ASR well and perform cycle testing.
- Conduct assessment of the Orangetree WWTP.
- Design, permit and construct any necessary repairs or capacity enhancements at the Orangetree WWTP.
- Identify and acquire property for SEWRF.

FY 2014-2017:

- Complete construction of the Bridge-the-Gap project (2014).
- Complete final design, permitting and construction for the NCWRF Expansion to 30.6 MGD MMDF (2017).
- Complete final design, acquire necessary real estate, permitting and construction of the Northeast WRF to 4.0 MGD MMDF (2017).

FY 2018-2022:

- Complete preliminary design, final design, permitting and construction of the Southeast WRF to 4.0 MGD MMDF (2022).

FY 2023-2027:

- Complete final design, permitting and construction for expansion of Southeast WRF to 6.0 MGD MMDF (2026).

2. Wastewater Collection and Transmission

FY 2008-2013:

- Complete the Vanderbilt Beach Road force main and activate new master pumping station at Vanderbilt Beach Road and Logan Boulevard.
- Complete installation of telemetry to all existing pumping stations.
- Continue to rehabilitate pumping stations and collection systems.
- Conduct assessment of Orangetree wastewater system, including physical infrastructure, to identify any required corrective actions.
- Implement any corrective actions required by assessment to facilitate provision of service to Orangetree.
- Provide wastewater service to Orangetree.

FY 2014-2017:

- Construct new master pumping stations along Immokalee Road associated with the expansion of Northeast WRF and acquire real estate as necessary.
- Continue to rehabilitate pumping stations and collection systems and acquire real estate as necessary.
- Acquire real estate as necessary for the East Central Master Pumping Station.

FY 2018-2022:

- Construct new East Central Master Pumping Station and Pretreatment Facility.
- Construct regional interconnection from the South Service Area to the Southeast Service Area and associated master pumping station, and acquire real estate as necessary.
- Continue to rehabilitate pumping stations and collection systems and acquire real estate as necessary.
- Improve pumping station capacities as described in Section 7.
- Improve transmission force main capacities as described in Section 7.

FY 2023-2027:

- Continue to rehabilitate pumping stations and collection systems and acquire real estate as necessary.
- Improve pumping station capacities as described in Section 7.
- Improve transmission force main capacities as described in Section 7.

3. Biosolids

FY 2014-2017:

- Prepare short-term and long-term biosolids management plan and implement biosolids management program.

4. Irrigation Quality Water

FY 2008-2013:

- Complete Irrigation Quality Water Master Plan.
- Add irrigation quality water transmission pipelines to improve system capacity, pressure and reliability, and acquire real estate as necessary.
- Begin construction of ASR irrigation quality water wells.
- Add additional customers as sufficient irrigation quality water is available.

FY 2014-2017:

- Implement recommendations made in Irrigation Quality Water Master Plan.
- Complete final design and permitting and construction of irrigation quality water pumping station to enhance flow transfer capacities between the NCWRF and SCWRF.

FY 2018-2027:

- Implement recommendations made in the Irrigation Quality Water Master Plan.

5. General

FY 2008-2013:

- Develop asset management program.
- Complete easement / ROW evaluation and asset alignment studies.
- Identify and acquire real estate and easement rights as appropriate and necessary to support current and future requirements.

Ongoing:

- Update the wastewater master plan and impact fee and rate analyses at a minimum of every three years.
- Continue to expand SCADA and GIS systems to focus on using these technologies as reliability measurement tools.
- Team training/certification compliance.
- Identify and acquire real estate and easement rights as appropriate and necessary to support current and future requirements.

2 Introduction

2.1 Background

The CCWD needs to have a vision for wastewater facilities to serve its customers in an environmentally and fiscally sound manner. The 2008 Wastewater Master Plan Update has been developed to establish that vision with the goal of providing a guide for wastewater facility planning for the next 20 years. Since the last master plan was prepared in 2005, there has been a significant reduction in the CCWSD rate of population growth.

The major goals of this master plan update are to:

- Confirm the strategic CCWSD 20-year plan to guide implementation of a totally compliant, cost-effective, reliable, integrated wastewater system that continues to protect public health, meet all state and federal regulatory requirements and meet the needs of the CCWSD through 2027.
- Provide guidance for concurrency and strategic planning.
- Provide documentation to support State Revolving Fund (SRF) loan applications to fund construction of proposed wastewater projects.

Provide an updated Capital Improvement Program (CIP) schedule to support the wastewater rate and impact fee studies.

2.1.1 General

The main goals of the wastewater master planning process are to develop a Countywide plan that will guide implementation of the wastewater utility system for the next 20 years to ensure regulatory compliance and meet public health wastewater service needs with a focus on concurrency and reliability. The recommendations included in this Wastewater Master Plan Update are consistent with these goals.

2.1.2 201 Facilities Plan and Previous Wastewater Master Plans

The initial 201 Facilities Plan was completed for Collier County in 1978. Updates to the initial facilities plan were completed as master plans for wastewater facilities in 1986, 1996, 1997, 2001, 2002, 2003 and 2005.

2.1.3 Post-2005 Wastewater Master Plan Actions

The implementation plan in the 2005 Wastewater Master Plan Update, dated June 6, 2006, included recommendations for projects and programs required by 2010 and by 2025. These improvements included wastewater treatment, wastewater transmission and effluent disposal projects. All of the near-term major improvements that were identified in the 2005 Master Plan Update are being implemented. The following is a list of the major wastewater accomplishments since the 2005 Master Plan Update:

- Completion of NCWRF expansion to 24.1 MGD MMDF
- Compliance with all federal and state programs
- Meeting of wastewater flow requirements with reliability
- Improved capacity to serve customers
- Enhancement of the GIS and SCADA systems
- Conducted design of the NEWRF
- Obtained FDEP UIC permits for deep injection wells
- Continued updates of utilities standards
- Prepared changes to Land Development Code
- Real estate and easement interests were obtained as required

A major significant accomplishment was the early closure of the consent order on September 16, 2006.

2.2 Scope of Study

2.2.1 Wastewater Service Area

The CCWSD can provide service only within the Water-Sewer District. The Water-Sewer District is generally includes the western one-quarter of Collier County, excluding Marco Island and the City of Naples, and is bounded on the north by Lee County, on the west and south by the Gulf of Mexico and on the east by the boundary line shown on Figure 2-1. The area currently served by the CCWSD wastewater service is smaller than the Water-Sewer District boundary as shown on Figure 2-1.

2.2.2 Scope of Services

The scope of services for this 2008 Wastewater Master Plan Update includes updating of population and flow forecasts within the planning area and updating of base maps, updating of regional wastewater treatment plant capacities, an analysis evaluation of the wastewater collection system and recommendations, updating of effluent management strategies and schedules and budgets for implementation of the recommended plan through 2027.

The evaluation of the wastewater collection system, comprised of force mains and master pumping stations, comprises is accomplished with hydraulic modeling to include any recently constructed facilities and revised flow forecasts to determine the required facilities and capacities.

The development of five-year and 20-year implementation plans and costs are included in the scope of services. The scope of services includes planning, engineering, and construction components.

The 2008 Wastewater Master Plan Update will serve as the basis for the development of updated rate structures and impact fees. The 2008 Wastewater Master Plan Update has been prepared in conjunction with the 2008 Water Master

Plan Update. The 2008 Wastewater Master Plan Update will also serve as the basis for the preparation of the Irrigation Quality Master Plan.

2.3 Other Reports

Other reports that relate to this Wastewater Master Plan Update include:

- 2005 Wastewater Master Plan Update, June 2006, Greeley and Hansen LLC
- Regional Irrigation Distribution System (RIDS) Master Plan, December 2002, Boyle Engineering Corporation (prepared for South Florida Water Management District)
- Wastewater Resource Planning Report, September 2002, Camp Dresser & McKee.
- NCWRF and SCWRF Capacity Analysis Reports, June 2003, Greeley and Hansen LLC
- 2005 Impact Fee Study, Public Resource Management Group.
- 2005 Water, Wastewater, and Reuse Rate Study, Public Resource Management Group.
- 2007 AUIR, December 2007, Public Utilities Division
- Evaluation of Per Capita Water Demand and Wastewater Flow, June 2007, Greeley and Hansen
- Official Statement for Collier County Water-Sewer District Water and Sewer Revenue Bonds Series 2006, December 2006
- Projections of Florida Population by County, 2007-2035, Bulletin 150, March 2008, BEBR
- Asset management Charter and Asset Management Technical Memorandums, CDM, 2007-2008
- Technology Investments for Water Utilities and Local Government, Gartner, Inc., April 2008

Results and information from these studies are incorporated in the 2008 Wastewater Master Plan Update.

3 Wastewater Service Areas

3.1 Existing Service Area

The existing Water-Sewer District boundary and the existing Wastewater Service Area are shown on Figure 2-1. As can be seen on the figure, the wastewater service area is smaller than the Water-Sewer District. The Wastewater Service Area is divided into the North Service Area and the South Service Area.

The North Service Area is approximately 78 square miles. This area is bounded on the north by Lee County, on the south by Golden Gate Parkway, and on the west by the City of Naples Service Area and the Gulf of Mexico. Wastewater flows in the North Service Area are treated at the NCWRF.

The South Service Area is approximately 58 square miles. This area is bounded on the north by Golden Gate Parkway, on the south by the Marco Island Service Area and conservation areas, and on the west by the City of Naples Service Area. Wastewater flows in the South Service Area are treated at the SCWRF.

The North and South Service Areas are discussed in greater detail in Section 4 and are shown on Figures 4-1 and 4-2, respectively.

3.2 Proposed Future Service Area

For purposes of this 2008 Wastewater Master Plan Update, it is assumed that Orangetree will become part of the CCWSD by 2012. Potential wastewater flows from this area are included in this Master Plan Update. It is not currently anticipated that the CCWSD will serve the Golden Gate Estates or take over the FGUA service area.

4 Existing Facilities

4.1 General

Wastewater service in the North and South Service Areas is provided by a network of gravity sewers, pumping stations, force mains, and water reclamation facilities. The North Service Area is shown on Figure 4-1. Service extends to approximately 48 square miles of the North Service Area. The collection system in the North Service Area consists of approximately 580 miles of pipeline (380 miles of gravity sewers and 200 miles of force mains), and 404 wastewater pumping stations. One hundred and five of the pumping stations pump directly to the NCWRF through manifolded influent force mains. All of the wastewater collected from the North Service Area is treated at the NCWRF.

The South Service Area is shown on Figure 4-2. The South Service Area covers approximately 58 square miles. The CCWSD currently provides wastewater service to about 40 square miles of this area. The collection system in the South Service Area consists of approximately 460 miles of pipeline (280 miles of gravity mains and 180 miles of force mains) and 344 pumping stations. Fifteen pumping stations pump directly to the SCWRF. All wastewater flow from the South Service Area is treated at the SCWRF.

The CCWSD infrastructure and operations for wastewater collection, treatment and effluent disposal is summarized in this section.

4.2 Water Reclamation Facilities

Treatment facilities constructed to serve irrigation quality water systems must be designed to meet Class I Reliability for process, electrical, and electrical systems in accordance with FDEP regulations. (Class I is the highest reliability standard and the CCWSD is required to comply with Class I due to the capacity of the two water reclamation facilities.) All CCWSD plants must meet these regulatory standards, when obtaining an operating permit. In addition, all treatment facilities must comply with CCWSD reliability standards.

4.2.1 North County Water Reclamation Facility

Wastewater treatment in the North Service Area is provided at the NCWRF, located on the east side of Goodlette-Frank Road just south of Immokalee Road. The plant provides advanced secondary treatment producing effluent consistent with requirements for irrigation quality water. Irrigation by irrigation quality water is the primary means of effluent disposal.

The present capacity of the NCWRF is 24.1 MGD MMDF. A compliance assurance project and a "bridge-the-gap" project are included in the CIP and will improve reliability and regulatory compliance for the existing facility. A 6.5-MGD MMDF expansion is the last recommended expansion, due to the physical limitations of the existing plant site, and is scheduled to be placed in service by 2017.

The NCWRF has two parallel treatment trains. In the first train, which is an 11.1 MGD MMDF Orbal oxidation ditch (extended aeration) facility, influent wastewater flows through the headworks where two mechanical bar screens and one manual bar screen provide preliminary treatment. The wastewater then flows into three aerated grit basins. From the aerated grit basins, wastewater flows into three oxidation ditches. Diffusers provide transfer of oxygen to the mixed liquor in each ditch which provide extended aeration. Activated sludge is returned to the head of the oxidation ditches by horizontal centrifugal pumps. The oxidation ditch effluent proceeds to five secondary clarifiers for final sedimentation. Effluent from the secondary clarifiers flows to eight traveling bridge automatic backwash filters for solids removal. Filtered effluent is routed to two chlorine contact chambers. Sodium hypochlorite is injected at the head of the chlorine contact chambers. Following the chlorine contact chambers, the treated and filtered effluent flows to the reuse pumping station, where it can be directed to appropriate disposal.

The second parallel treatment train is a 13.0 MGD MMDF facility, which uses the Modified Ludzack-Ettinger (MLE) process. In the MLE facility, the influent wastewater flows through mechanical bar screens, aeration grit chambers, and then into aeration basins. The aeration basin effluent proceeds to secondary clarifiers for final sedimentation. A portion of the aeration basin effluent (mixed liquor) is recycled to the aeration basin as part of the MLE process to promote denitrification. Effluent from the secondary clarifiers flows to traveling bridge automatic backwash filters for solids removal. Filtered effluent is routed to chlorine contact chambers. Sodium hypochlorite is injected at the head of the chlorine contact chambers. Following the chlorine contact chambers, the treated and filtered effluent flows to the reuse pumping station, where it can be directed to appropriate disposal.

In accordance with the Consent Order, the CCWSD constructed two 1.5-MG flow equalization tanks at the NCWRF to increase plant reliability for handling higher peak hourly flows.

The permit for the NCWRF limits the effluent disposal from the plant to either irrigation or deep well injection. The NCWRF also has several ponds located on site to assist with effluent handling and reject water storage. NCWRF effluent water quality limits are as follows:

Chart 4-1
NCWRF Effluent Limitations, mg/L (1)

Parameter	Irrigation	Deep Well Injection
$CBOD_5$	20	60
Total Suspended Solids	5	60
Fecal Coliform	25/100 ml	200/100 ml
Turbidity	2.5 NTU	No Limit
PH	6.0-8.5	6.0-8.5
(1) Source: FDEP Permit No. FL0141399-013-DW1P		

The NCWRF is designed, permitted and operated to stay in compliance and to meet all wastewater treatment standards and effluent disposal. There has been increased demand for irrigation quality water with more focus on consistently meeting irrigation quality water demand with reliability in an efficient and effective manner. SCADA facilities at the plant have been expanded to improve operating capabilities. Each plant process needs to be evaluated independently to provide necessary reliability with regard to production of irrigation quality water. This will require development of multiple compliance points and criteria for upgrades to plant processes to meet the reliability -related demand (through creating independently inclusive process trains in lieu of one large system where reliable and sustainable irrigation quality water production may not be possible). These upgrades to meet demand and sustain irrigation quality water production that meets compliance criteria will be constructed as part of the compliance assurance and "bridge-the-gap" projects.

Irrigation quality water is pumped through a transmission system to irrigation customers. Two DIWs and a DIW pumping station were added at the NCWRF as a part of the expansion to 24.1 MGD MMDF. The two DIWs have a permitted capacity of 37.3 MGD maximum daily flow (18.65 MGD each). No additional ponds for storage are recommended, since the CCWSD has DIWs at the plant and irrigation quality water ASR storage should be available within the next five years.

Biosolids are dewatered and trucked from the NCWRF for disposal at a landfill. Biosolids at the NCWRF are dewatered using belt filter presses. The sludge dewatering building was expanded as part of the modifications that increased plant capacity to 24.1 MGD MMDF. The sludge dewatering building size is adequate for the ultimate plant capacity of 30.6 MGD MMDF; however, a sixth belt filter press will be required.

4.2.2 South County Water Reclamation Facility

Wastewater treatment in the South service area is provided at the SCWRF. The SCWRF is located approximately one mile south of Rattlesnake Hammock Road and ¾ of a mile east of US-41. The plant provides advanced secondary treatment producing effluent quality that consistently meets all irrigation quality water requirements.

The present permitted capacity of the SCWRF is 16.0 MGD MMADF. The SCWRF is a domestic wastewater treatment facility that utilizes the Modified Ludzack-Ettinger (MLE) treatment process.

The SCWRF operates two 1.25 MG flow equalization tanks that allow the flow to enter the preliminary treatment system and biological treatment processes at a steady flow rate twenty four hours per day.

The preliminary treatment process which includes three automatic bar screens and two manually operated bar screens, which remove debris in the raw wastewater stream that is larger than ½ inch in size. Bar screens are used to prevent

downstream damage to treatment equipment. The preliminary treatment process also includes four grit removal units to remove high density objects that can not be suspended in the wastewater stream at velocities of 1.5 feet per second or less. The grit units are used to prevent the build up of sand and grit in the bottoms of the anoxic and aeration basins where the flow velocity can be less than 1.5 feet per second. Odor control chemical scrubber units are used to reduce or eliminate odors from the treatment processes.

The biological treatment process includes fourteen parallel trains within one common structure. Each train consists of two anoxic zones equal to 1/3 the volume of each train for the conversion of ammonia (NH3) to atmospheric nitrogen (N2). Each train also includes one aeration basin which equals 2/3 the volume of each train. The aeration portion of the trains converts Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) to Mixed Liquor Suspended Solids (MLSS) that is used to settle solids during the clarification process and for conversion of ammonia and BOD when returned to the biological treatment trains.

The next phase of the activated sludge process is the clarification process. The primary purpose of clarification is to provide a quiescent environment in which biological floc that was formed in the aeration basin can settle out of the wastewater. The settled floc is removed from the clarifiers and returned to the aeration basins to convert ammonia and reduce influent BOD. The SCWRF utilizes a total of four clarifier units, two 130' diameter center feed circular clarifiers and two 110' diameter center feed circular clarifiers.

The SCWRF has a total of eight traveling bridge filters that are used to remove small amounts of suspended solids that may remain in the water after the clarification process. After the traveling bridge filters, the water is disinfected with a solution of sodium hypochlorite to destroy any harmful bacteria that may be in the water.

Residuals (excess MLSS) are sent to two 330,000 gallon aerated sludge holding tanks and are dewatered by five belt filter presses. The dewatered sludge is conveyed to trucks that transport the dewatered sludge to a landfill.

The permit at the SCWRF limits the effluent disposal from the plant to three options, irrigation, wetlands mitigation, and deep well injection at the plant site. SCWRF effluent water quality limits are as follows:

Chart 4-2
SCWRF Effluent Limitations, mg/L (1)

Parameter	Irrigation	Wetlands Mitigation	Deep Injection Wells
CBOD 5	20	20	60
Total Suspended Solids	5	5	60
Turbidity	3.0 NTU	3.0 NTU	No Limit
Nitrate	No Limit	12	No Limit
PH	6.0 to 8.5	6.0 to 8.5	6.0 to 8.5
Fecal Coliform	25/100 ml	25/100 ml	200/100 ml
(1) Source: FDEP Permits Nos. FL0141356-011-DW1P and 52258-197-UO and Collier County Wastewater Department			

The SCWRF operates two Deep Injection Wells (DIWs) for disposal of excess water or water that does not meet Irrigation Quality Water standards. Injection Well No. 1 has a permitted capacity of 18.0 MGD, and Injection Well No. 2 has a permitted capacity of 18.65 MGD. The wells are limited to 16.0 MGD on a Maximum Monthly Average Daily Flow (MMADF) basis.

The SCWRF has an on-site 6.6 MG Irrigation Quality storage tank that acts a reservoir for the Irrigation Quality water distribution pumping station, and a 4.4 MG reject water storage pond for water that falls below Irrigation Quality standards. Water from this pond can be pumped back into the treatment facility to be further treated to meet all Irrigation Quality water standards.

Biosolids facilities include two 330,000-gallon waste activated sludge holding tanks. Biosolids are dewatered using the belt filter presses and are currently trucked from the SCWRF to a landfill for disposal.

4.3 Effluent Disposal Facilities

4.3.1 General

An Irrigation Quality Water Master Plan will be completed in 2008. The CCWSD has prepared an irrigation quality water policy, including how irrigation quality water should be allocated to potential irrigation customers in the future. The extent of the existing infrastructure providing irrigation quality water to CCWSD customers is shown on Figure 4-3.

The primary means of effluent disposal at both the NCWRF and SCWRF is distribution to irrigation quality water customers for irrigation use. Excess water or water unsuitable for public access irrigation is pumped into DIWs as the CCWSD secondary means of effluent disposal. In 2002, an interconnection between the two systems was created allowing limited irrigation quality water and supplemental

water to be exchanged between the two service areas. Although the interconnection is in place, the volume of irrigation quality water that can be transferred is limited due to system hydraulics. A new irrigation quality booster pumping station has been designed to allow for increased flow transfers. Irrigation quality water is produced at the WRFs as the source of supply for the system. The irrigation quality water can be temporarily stored at the WRFs in ponds on site or distributed for use or storage at customer sites. The CCWSD goals for the irrigation quality water system are to meet the allocations established under each customer agreement and to maximize the reuse of irrigation quality water, minimizing disposal using DIWs.

The irrigation quality water system serving customers in the CCWSD has evolved from one of strictly effluent disposal to one of irrigation quality water service provider. However, the primary function of the irrigation quality water system is for effluent disposal, as required by the operating permits of the water reclamation facilities. Although some CCWSD customers have a backup supply of irrigation water from wells, other customers depend on the CCWSD irrigation quality water system as their sole source of irrigation water. Customers largely consist of bulk commercial customers and residential communities. The CCWSD is compensated by its customers based on a rate established by the CCWSD.

4.3.2 North Service Area

The extent of the existing irrigation quality water system in the North Service Area is shown on Figure 4-3. The NCWRF irrigation quality water system has a permitted capacity of 12.82 MGD AADF for slow-rate public access irrigation.

During wet weather conditions, the demand for irrigation quality water declines considerably. Storage is required to ensure there is adequate irrigation quality water during periods of high demand as well as a means of holding the irrigation quality until it can be used. The total storage available in the North Service Area is approximately 43.9 MG, of which 19.8 MG in storage is provided by customers. The NCWRF has a total storage capacity of 24.1 MG; however, 10.1 MG of this storage is provided in unlined ponds, which do not furnish effective dry season storage due to percolation. The decommissioned PBWRF has an irrigation quality water storage capacity of 3.5 MG. Currently there is a total of 18.1 MG of irrigation quality water storage available in lined ponds or tanks in the North Service Area. Monitoring and operation of the irrigation system pumping stations have been enhanced through the use of the SCADA system.

Sources of supplemental water are available in the North Service Area. The Livingston Road Wellfield is directly connected to the Pelican Bay development, located west of US 41. In the case of the Pelican Bay area, irrigation quality water supplements the groundwater available from the Livingston Road Wellfield. The Immokalee Road Wellfield was placed in service in 2002 and also provides supplemental water for irrigation and is connected directly to the irrigation quality water transmission system. Supplemental water from the Immokalee Road Wellfield is used to provide greater system reliability for irrigation quality water customers, particularly in the dry season.

4.3.3 South Service Area

The extent of the irrigation quality water system serving the South Service area is shown on Figure 4-3. The South Service Area has a total irrigation quality water storage capacity of 11.98 MG, which consists of the 6.6 MG storage tank on the SCWRF site and storage tanks at Countryside (0.92 MG), Foxfire (1.1 MG), Glades (2.0 MG), and Royal Palm (1.36 MG). Unlined disposal / percolation ponds at Eagle Lakes Park provide a capacity of 101 MG.

The SCWRF operates two Deep Injection Wells (DIWs) for disposal of excess water or water that does not meet Irrigation Quality Water standards. Injection Well No. 1 has a permitted capacity of 18.0 MGD, and Injection Well No. 2 has a permitted capacity of 18.65 MGD. The wells are limited to 16.0 MGD on a Maximum Monthly Average Daily Flow (MMADF) basis.

The South Service Area does not have a source of supplemental water; however, the irrigation quality interconnection between the North area and the South area can be opened to provide irrigation quality water to the customers in the South Service Area when needed. In addition to irrigation quality water customers, the CCWSD also provides irrigation quality water to the Eagle Lakes wetlands mitigation area. The operating permit for the SCWRF requires that the CCWSD apply irrigation quality water to Eagle Lakes to maintain a certain minimum level, which is seasonally adjusted. The CCWSD does not receive compensation for irrigation quality water sent to the Eagle Lakes ponds.

4.3.4 Irrigation Quality Water Aquifer Storage and Recovery

The purpose of the irrigation quality water ASR wells is to store excess irrigation quality water in the wet season for use during the dry season to help protect and preserve the fresh and potable water supply. The irrigation quality water is stored in a deep brackish water aquifer system that is isolated from the freshwater aquifers that lie several hundred feet above. There are hundreds of feet of confining clays and other strata separating the brackish aquifer from the fresh water aquifer. In addition, all stored water is pretreated to meet primary drinking standards and will be monitored by a comprehensive system.

The CCWSD constructed one irrigation quality ASR well in 2006 with completion and cycle testing scheduled by 2010. A total of five irrigation quality water ASR wells are planned. Each ASR well will be able to receive or deliver up to 1.0 MGD of irrigation quality water. This project will enhance the ability to store irrigation quality water rather than dispose of this water by deep well injection during periods of low irrigation demands. Real estate acquisition may be required for the ASR wells and required pipelines.

4.4 Biosolids Handling

4.4.1 General Biosolids Considerations

Biosolids (or sludge) is the residual product remaining from the treatment of wastewater. The solids consist of various inert components and of biological solids

created during the activated sludge process. Biosolids can be treated in a variety of ways that affect the manner in which the material can be used or disposed. Biosolids are removed from the wastewater in liquid form as waste activated sludge (WAS). Typically, the WAS is less than one percent solids and is handled as a liquid. The consistency of this material is similar to water.

4.4.2 Regulations Affecting Biosolids Management

Biosolids are regulated by the United States Environmental Protection Agency (USEPA) under a variety of regulations, including 40 CFR Part 503. The FDEP regulations affecting biosolids management include F.A.C Chapter 62-640. The FDEP regulations, for the most part, follow the USEPA regulations.

4.4.3 CCWSD Biosolids Handling Practices

The CCWSD currently trucks biosolids to the Okeechobee landfill for disposal, which is not a long term solution. The plan to develop a long term solution is discussed in Section 6.

5 Population and Flow Projections

5.1 Population Estimates

5.1.1 General

Population estimates for this 2008 Water Master Plan Update are based on populations provided by CCCPD in August 2007 and the BEBR "Projections of Florida Population by County, 2007-2035, Bulletin 150, released by BEBR in March 2008. Using the March 2008 BEBR population forecasts, the CCWSD populations have been reduced to 92 percent of the August 2007 populations prepared by CCCPD. The eight percent reduction is based on an average eight percent reduction in this year's Medium growth range forecast of populations (Bulletin 150) from the BEBR 2007 Medium growth range forecasts (Bulletin 147). The previous master plans were based on population projections from CCCPD based on BEBR High growth projections to 2015 and BEBR Average populations from 2016 to 2030. The change from using BEBR High to BEBR Medium more closely matches recent growth data. The population projections for this master plan update are significantly lower than projections used in previous master plans and AUIR's.

The process to place a new wastewater treatment facility in service requires a decision window of eight years from initial planning to completion of construction. Planning to keep pace with the growth curve helps the CCWSD meet the needs of the rate-payers, provide reliable service and provide environmental value.

5.1.2 Future Service Areas

Future service areas include the areas within the Water-Sewer District boundary not currently served and the Orangetree Area. Population projections for the current Water-Sewer District and the Orangetree Area were provided by CCCPD.

5.1.3 Total Potential Service Area Population Projections

The estimates of future population annually through 2027 are shown on Table 5-1. A summary of the service area populations in five-year increments through 2027 is provided in Chart 5-1.

Chart 5-1

Estimated Total Sewered and Unsewered Populations Within the County Water-Sewer District (1)

Area	2008	2010	2015	2020	2025	2027
Existing Water-Sewer District	179,600	194,300	228,200	259,600	287,700	298,200
Orangetree	5,200	7,100	11,500	14,600	14,600	14,600
Totals	184,800	201,400	239,700	274,200	302,300	312,800
(1) Source: CCCPD population estimates and projections dated 10 Aug 2007 updated based on BEBR Bulletin 150 dated March 2008						

These values represent the projected total populations within the service areas, without regard to sewer service. Several areas could remain on septic tank service. These estimates of population are used in Section 7 to develop wastewater flows for specific alternatives.

It is recommended that these population estimates be used for planning purposes and continue to be monitored.

5.2 Per Capita Wastewater Flow

The per capita wastewater flow is the total wastewater flow in one year divided by the total permanent (October 1) population for that year.

The adopted per capita wastewater flow LOSS's are 145 and 100 gpcd for the North Service Area and South Service Area, respectively. The adopted LOSS for new areas not currently served by the NCWRF or the SCWRF is 120 gpcd.

It is recommended that the LOSS for the North Service Area be changed from 145 gpcd AADF to 120 gpcd based on recent measured changes in wastewater flow. The average per capita flow for the last 8 years (2000 – 2007) in the North Service Area is 112 gpcd, as shown in Table 5-2. The reduction in wastewater flows are somewhat attributable to an aggressive wastewater collection system improvement campaign to reduce inflow and infiltration and reductions in water use. Wastewater flows to the NCWRF have shown a significant decrease in the past two years, particularly during the wet season months. In July and August 2007, wastewater flows to the NCWRF were 36.1 and 22.8 percent lower than in July and August 2006, respectively.

The average per capita flow in the South Service Area for the last 8 years (2000 – 2007) was 90 gpcd, as shown in Table 5-2. It is recommended to continue to use 100 gpcd AADF for the South Service Area.

It is also recommended to continue to use 120 gpcd for the new areas not currently served by the NCWRF or SCWRF.

5.3 Wastewater Flow Projections

When considering wastewater flow projections, the following level of service conditions are typically used:

- Annual Average Daily Flow (AADF): Total wastewater flow measured in one year divided by the number of days in that year.

- Maximum Month Daily Flow (MMDF): Maximum quantity of wastewater flow measured during a single month during a one-year period, divided by the number of days in the month. The CCWSD utilizes the MMDF for sizing treatment facilities.

- Peak Hourly Flow (PHF): Maximum quantity of wastewater flow measured in a single hour in a single hour during a one year period.

The wastewater flow projections for the North and South Service Areas are shown in Table 5-1. The projected maximum month daily wastewater flow is 49.3 MGD in 2027. Wastewater flow projections for the CCWSD existing and future service areas are used in Section 7 for planning wastewater facilities. When considering flow projections as they relate to planning for wastewater facilities, peak rates of flow need to be considered. FDEP requires that the treatment plant expansions and new permits for CCWSD plants be designed for MMDF. Ratios of MMDF to AADF for the NCWRF and SCWRF over the last eight years are shown on Figure 5-1. The data show that the MMDF to AADF ratio averages about 1.2 for the period of 2000 to 2007. There were three years of the last eight where the ratio has been higher than 1.2 at both the NCWRF and the SCWRF with a maximum ratio of about 1.25. Therefore, a ratio of 1.3 is recommended to continue to be used for planning purposes.

Design of wastewater transmission facilities requires the use of peak hour flow rates. The accepted method for calculation of peak hour flow rates is by using the following formula from the Ten State Standards:

$$\text{Peak hour factor} = \frac{18 + (p)^{1/2}}{4 + (p)^{1/2}}$$, where p = population in thousands

Peak hour flow is determined by multiplying AADF by the above peak hour factor.

In FY08 PUD began a flow metering project, which will ensure that there are working flow meters with readily available flow data for all 22 Master Pumping

Stations and 48 other key pumping stations. When completed, the PUD will be able to analyze average, maximum and peak flows in 70 wastewater drainage basins or sub-basins, which will then be compared to the calculated flow estimates for verification purposes.

6 Concurrency Management and System Reliability

6.1 Introduction

Wastewater collection, transmission and treatment facility capacities need to be concurrent with growth. The CCWSD needs to have sufficient reliable capacity in place at the time new development occurs and new customers are added to the system. It is also important that the CCWSD not overbuild in order to avoid increased costs associated with unused facilities.

The term "concurrency" is from Chapter 163 of the Florida Statutes, which is the Growth Management Act. The Growth Management Act, which was passed in 1985, and was amended in July 2005, mandates that public facilities and services needed to support development must be available concurrent with the local impact of such development. The public facilities and services covered are stormwater drainage, potable water, wastewater, solid waste, and parks. The minimum Level of Service Standards (LOSS) for each of these services is listed in the Collier County Capital Improvement Element. The LOSS requirements are achieved by spatial coordination of public facilities with land uses through the Future Land Use Map and Future Land Use Element; and temporal coordination through infrastructure and growth management planning. The LOSSs are binding, and no final local Development Order may be issued that is not consistent with the CCCPD concurrency management system.

It is not enough, however, for facilities just to be in place. They must also offer customers reliable service in accordance with regulatory requirements and appropriate standards of practice.

This section of the 2008 Wastewater Master Plan Update addresses concurrency and utility management issues.

6.2 Concurrency

As noted in the Introduction, the CCWSD is required to maintain a concurrency management system. There are reporting requirements to various regulatory agencies regarding concurrency. The cornerstone of the concurrency process is the latest Wastewater Master Plan. The Wastewater Master Plan provides the analyses and recommendations for capacity and reliability improvements. Since 2001, the Wastewater Master Plans have been updated five times to account for the rapid growth in population and changes in the Water-Sewer District boundaries.

The prime component of concurrency is the Annual Update and Inventory Report (AUIR) reporting required under the Growth Management Plan. The AUIR is a system capacity report prepared each year by the Public Utilities Division and presented to Community Development and Environmental Services (CDES) as required by the State. The capital improvements element, Florida Statute 163.3177(3), requires that privately funded improvements be included in the capital

improvements schedule if they are necessary to serve development, and the funding guaranteed in an enforceable agreement. Capital improvement elements must be updated annually to maintain a financially feasible schedule of capital improvements.

Another concurrency document is the Sanitary Sewer Sub-Element of the Growth Management Plan. The Department of Community Affairs (DCA) requires that the Sub-Element be updated every seven years, or annually as needed. The last update was in 2007. The Sanitary Sewer Sub-Element draws upon the information in the latest Wastewater Master Plan. The Sub-Element also includes a summary of Capital Improvement Elements (CIEs), which is a five-year summary of capital expenditures expected to maintain the necessary level of service and to keep up with growth. It is recommended that an Irrigation Quality Sub-Element also be developed.

The Evaluation and Appraisal Report (EAR) is another concurrency document that is required by the State every seven years. This report is also developed based on input from the latest Master Plan and Sanitary Sewer Sub-Element.

Although impact fees are not a component of concurrency, these fees are required to be reviewed every three years. It is recommended that the rate studies be done every three years with the impact fee review.

A summary of the various components of concurrency is as follows:

Chart 6-1
Concurrency Components (1)

Concurrency Element	Frequency of Update
AUIR	Annually
Sanitary Sewer Sub-Element and CIE	Every Seven Years, or annually as needed
EAR	Every Seven Years
(1) Source: Collier County Community Development and Environmental Services	

6.3 Sustainability and Reliability

Two important concepts associated with utility management are reliability and sustainability. With respect to utility management, "reliability" refers to the provision of infrastructure required to serve customers dependably without interruption of service. A well-managed utility must therefore provide sufficient treatment, collection and transmission facilities beyond the minimum required to meet capacity. "Sustainability" refers to the resources required to support the utility. Sustainability refers to staffing, financial, and information management resources required to operate an efficient and effective utility.

Wastewater customers expect a high level of service in exchange for the rates that are paid. For most rate-payers, reliable service will mean invisible service. This is service without disruption, odor problems or operating problems such as noise, and in full compliance with all requirements for the protection of public health. The CCWSD utility enterprises need to efficiently provide service to customers at rates that most citizens will consider being reasonable and shared equitably. An equitable system is one is which the customer pays in proportion to the benefit received ("he who pays benefits" and "he who benefits pays").

Customer satisfaction is one of the key objectives of a utility. In addition, a utility has objectives of environmental protection, resource conservation and providing a nexus between cost and benefit. This section examines these objectives and provides a framework for the maintenance of utility that is both reliable and sustainable.

Utility Reliability Guidelines prepared by the Public Utilities Division are included as Appendix B.

6.3.1 Areas of Utility Management

6.3.1.1 General

Every area of the wastewater utility contributes in some way to utility management. In general these areas consist of the human resources, physical systems, financial systems, and administration and planning.

It is important that the employees be qualified for their positions, well trained, and dedicated to the objectives of the utility. It is also important that they be satisfied in their jobs and are motivated to advance in the organization. Part of having a well-managed utility is having a staff that feels that they are an important part of the organization.

Physical systems consist of the treatment plants, pumping stations, collection and transmission systems, irrigation quality water systems, and maintenance facilities. To provide reliable service, it is necessary to operate and maintain these systems in a way that maintains their value.

Utility administration and planning is necessary to maintain reliable service in the long term. Prudent planning assures that there is adequate capacity for new users. This requires development of plans that are coordinated with other local, state and federal agencies. Planning and concurrency management need to be on-going and flexible efforts, particularly in areas with changing growth rates such as Collier County.

6.3.1.2 Utility Staff

6.3.1.2.1 General

The utility staff consists of every person employed by the Collier County Public Utilities Division (PUD), more particularly the Public Utilities Engineering

Department, Wastewater Department, Utility Billing and Customer Service, Operations Department and PUD Administration. This team of personnel determines whether or not the CCWSD utility business successfully provides service to its customers. This section discusses several aspects of a staffing leading to an environment of sustainable services.

6.3.1.2.2 Qualifications

Each staff position should continue to have a job description that includes the qualifications that the person having the position should hold. All staff should be qualified for the positions that they hold. The CCWSD has satisfactorily met this requirement. Licensing is required for operational personnel and project managers are encouraged to obtain a Project Management Professional certification by the Project Management Institute. Professional engineering licenses are encouraged for all project managers and required for Senior and Principal Project Managers. All wastewater treatment operators are required to obtain a State license. Financial incentives for higher class license levels encourage career development.

6.3.1.2.3 Compensation

In order to recruit employees that are qualified and to maintain motivation of existing employees, salaries must be competitive. With the cost of living being relatively higher in Collier County than elsewhere, salaries may necessarily be higher for Collier County than they would be in other Florida utilities. Human Resources annually reviews salaries and will continue to do so to ensure that staff is compensated at or above market value. It is easier to recruit and retain well-qualified employees with competitive salaries.

6.3.1.2.4 Training

Training of employees provides them with the tools necessary to perform their jobs and also can make employees feel valued. A trained employee is more valuable to the utility and is more valuable in the marketplace.

In certain areas, cross training may be helpful to minimize staffing requirements. For instance, plant operators can be cross-trained to perform routine maintenance of equipment. This has the double benefit to the utility of minimizing maintenance staff and keeping the operators more aware of the equipment under their care. It also has the benefit to the employee of making him or her more valuable.

Project managers are trained in all areas of project management. The CCWSD has a Career Progression Program which allows team members to be compensated for earning additional certifications that relate to their specific jobs.

6.3.1.2.5 Level of Staffing

The level of staffing must be sufficient to meet the objectives of the utility, but also must be low enough to keep operating costs economical. A benchmarking study can be used to determine if the current level of staffing and staff positions is adequate to meet CCWSD objectives. It compares current staffing levels and staff positions with other well-run utilities. The CCWSD conducted a benchmarking study through

American Water Works Association to identify strengths and opportunities for improvement in 2005.

6.3.1.3 Water Reclamation Facilities

6.3.1.3.1 General

Currently, the CCWSD owns and operates two water reclamation facilities on a full-time basis. This section discusses reliability issues regarding the water reclamation facilities processes and equipment.

6.3.1.3.2 Process, Mechanical and Electrical Systems

The FDEP defines three classes of reliability for process, mechanical, and electrical systems of wastewater facilities. Class I, Class II, and Class III Reliability are described in the USEPA document *Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability* (1974). The document defines reliability as "a measurement of the ability of a component or system to perform its designated function without failure." Requirements are set for the three reliability classes for the design of the facilities and systems. These requirements establish minimum standards of reliability of the physical facilities, and are based on whether the effluent quality will degrade receiving waters for discharge. Treatment facilities that serve irrigation quality water systems must be designed to meet Class I Reliability. Class I Reliability requires the most stringent design criteria. General design requirements that are discussed in the document are summarized as follows:

- Locate plants such that they can be fully functional during a 25-year storm.
- Make provisions for flushing of scum and sludge lines.
- Make provisions for mechanical cleaning of wastewater and sludge lines.
- Provide drains at low points.
- Provide space for maintenance of equipment.
- Provide means to remove equipment, such as lifting systems.
- Provide means for isolation of equipment and systems for maintenance.
- The main drive mechanism of clarifier sludge collectors is to be repairable without draining the tank.
- An alternate means of sludge disposal is to be provided.
- Two separate and independent sources of electric power are to be provided.
- Each source of power is to be transformed to useable voltage with a separate transformer.
- Vital components of the same type and serving the same function are to be divided as equally as possible between at least two motor control centers.
- Manual overrides are to be provided for all automatic control systems.

Facilities with Class I reliability are required to comply with the following:

- Unit operations are to be designed to hydraulically handle the peak flow with the largest unit out of service.
- Facilities are to have mechanically cleaned bar screens with a backup.
- Backup pumps are to be provided for each pumping system.

- Final sedimentation tanks are to be designed such that with the largest unit out of service, the remaining units shall have at least 75 percent of the total design capacity.
- At least two equal volume aeration basins are to be provided.
- Blower capacity is to be such that the full aeration demand can be satisfied with the largest blower out of service.
- The number and size of the disinfection basins are to such that with one unit out of service the remaining units have at least 50 percent of the total design capacity.
- The alternate source of electric power is to be "sufficient to operate all vital components, during peak wastewater flow conditions, together with critical lighting and ventilation."

Compliance with these reliability standards is required to obtain an operating permit. Both CCWSD plants currently meet these standards.

6.3.1.3.3 Flexibility

Operations staffs can respond to unusual circumstances if process flexibility is provided in the design. Often this will consist of an extra gate or valve to allow flow to be transferred in a different manner. When reviewing plans prepared by a consultant, it is recommended that the CCWSD look for ways to make the facilities more flexible. Adding flexibility will typically cost marginally more, but will also increase reliability above the minimum requirements.

6.3.1.3.4 Capacity Enhancement

The CCWSD has seasonally higher wastewater flow rates, and treatment facilities are required to be designed for maximum month conditions. The CCWSD has enhanced capacity by trimming daily peak flows through construction of equalization tanks at both plants. The equalization tanks improve plant performance and enhance reliability when peak flows are experienced. Continuing inflow/infiltration improvements will result in reductions of peak flows during the wet season.

6.3.1.3.5 Safety

Safety in design and operation provides reliability by protecting the public and CCWSD personnel. Regular safety training and exercises should be continue to be scheduled to increase the preparedness by personnel.

6.3.1.3.6 Standard Operating Procedures

Standard Operating Procedures (SOPs) should be available for all equipment and processes at each plant. The SOP provides operators with "cook book" information about plant operational procedures and should be available at each facility. SOPs should be kept current as procedures change over time.

6.3.1.3.7 Disaster Preparedness

Responsible management of a utility includes taking the required steps to maintain a continuity of operations during emergency conditions. Many of the previously

discussed objectives of the CCWSD for maintaining a reliable utility will also contribute to the utility's sustainability during potential disasters. Interconnections, back-up power facilities, reliability treatment trains, and adequate well-trained staffing will increase the flexibility of a utility and minimize service disruptions due to uncontrollable circumstances.

Emergency response plans are be in place for the plants as required by Local, State, and Federal regulations. The plans detail the response protocol for various emergencies, such as broken mains, equipment failure, and hurricanes. It is vital that the CCWSD actively participate in emergency preparedness especially hurricane preparation. The County and each individual Department maintains and keeps updated a hurricane response plan. CCWSD facilities are vulnerable from damage from high winds, tidal surge and heavy precipitation.

The 2007 Public Utilities Emergency Department's Hurricane Plan addresses preparatory actions required for Hurricane Alert Planning (Level 1 - 36 or more hours in advance). Hurricane Watch Action Plan (Level II – 24 to 36 hrs.), Hurricane Warning Action Plan (Level III – 12 – 24 hrs.) during the Hurricane (Level IV), Hurricane Aftermath (Level V). These plans must be kept up to date and enhanced on the basis of lessons learned.

6.3.1.3.8 Laboratory Information Management System

The Laboratory Information and Management System (LIMS) is installed and in full operation. The system is utilized daily to record laboratory testing required by FDEP. The LIMS system is also used to assist with trending of data to identify potential problems before they become widespread. Five years of data has been loaded into the system and all laboratory technicians have been trained to use the system.

6.3.1.4 Collection and Transmission Systems

6.3.1.4.1 General

It is important that the CCWSD have reliable and flexible facilities to transport wastewater to each of the water reclamation facilities. Pumping stations are in the neighborhoods and are typically close to CCWSD customers. In order for these facilities to go unnoticed by the public, it is important for the CCWSD to maintain systems to prevent overflows, mitigate odors, and inhibit noise from the facilities.

6.3.1.4.2 Mechanical and Electrical Systems

Wastewater pumping stations must be designed for mechanical and electrical reliability. All pumping stations must be designed to provide capacity to handle peak flows with the largest pumping unit out of service. Pumping stations should also be designed with an available source of backup power. For smaller stations, this can be accomplished by providing a connection for a portable backup generator. Larger stations should have their own source of backup power typically on-site standby generators. Permanent generators should be exercised on a periodic basis to ensure reliable starting when power outages occur.

6.3.1.4.3 CMOM

In January 2005, the USEPA issued a "Guide for Evaluating Capacity, Management, Operation and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems." The document does not constitute a regulation. However, it is used by the FDEP to assure that operators of sanitary sewer systems demonstrate that all aspects of their infrastructure have sufficient capacity and are operated and maintained in such a way as to prevent overflows, the main goal of CMOM. It is recommended that the CCWSD prepare a CMOM self-evaluation to determine how the utility and its infrastructure compare to the CMOM requirements.

Part of CMOM is demonstration that excessive inflow and infiltration (I/I) is not allowed to enter the collection and transmission system. The CCWSD has an ongoing program of I/I reduction that will need to continue in order to ensure that plant and pipeline capacity is not consumed by excess water during wet weather conditions.

6.3.1.4.4 Flexibility

An important part of reliability enhancement of collection and transmission systems is to have the flexibility to move wastewater to multiple locations. The CCWSD is already interconnected with the City of Naples to allow wastewater to be transferred to the City on a temporary basis for treatment should some emergency occur. There is also an interconnection between the North and South Service Areas, on the west side of the service area, which allows wastewater to be transferred between the two areas. In addition, a second and larger interconnection along Santa Barbara Boulevard is completed but cannot be placed into operation until the new 24-inch force main along Vanderbilt Beach Road is ready for service. The Vanderbilt Beach Road force main is expected to be completed in 2008, which will provide the ability to utilize this interconnection.

It is recommended that the interconnections be completed and that interconnections of all future service areas be included as part of the design for infrastructure improvements. Such interconnections allow transfer of wastewater to plants that may have excess capacity on a long-term or a short-term basis.

6.3.1.4.5 Pumping Station Odor and Corrosion Control

Pumping stations and force mains create anaerobic conditions that are favorable to the generation of hydrogen sulfide, a corrosion and odor-producing compound. Pumping stations in the CCWSD are typically located near populated areas. For this reason, odor control is particularly important. The CCWSD has a zero tolerance policy for odor and uses a coordinated approach to odor control, balancing the use of monitoring, operational controls, chemical additives, biofilters and chemical scrubbers to achieve its goals. The CCWSD has developed the following odor-control strategy:

- Evaluate the odor sources, odor levels, and available odor-control technologies.
- Standardize on odor-control equipment design and suppliers.

- Balance upstream chemical addition with scrubber chemical costs.
- Provide regular service and maintenance, including spare and replacement parts.

This coordinated approach to odor control has proven effective. Having laid the groundwork, the CCWSD is confident that it has the knowledge and resources ready to respond quickly and effectively to odor control issues wherever they occur.

The CCWSD has installed odor control facilities at all major pumping stations. In addition, the CCWSD has implemented a program to reline wet wells and manholes with corrosion resistant materials to extend service life. Other neighborhood impacts, such as noise and aesthetics, need to be considered in the design of new pumping stations.

6.3.1.4.6 Pipeline Coordination with Road Improvements

Planning for new pipelines should be coordinated with roadway improvements to minimize citizen inconvenience and to minimize the cost of restoration. This is the current practice and should be continued.

6.3.1.4.7 System Mapping

CCWSD operations and maintenance personnel need to have accurate mapping as a tool to provide reliable service. The CCWSD operates a relatively complex transmission system with many manifolded force mains. It is important to know how the existing piping is interconnected, the size and location of all pipelines, and the location and type of all valves. One of the challenges to accurate mapping is that high quality record drawings are not available. A critical goal is to strive to enforce provisions of the Utility Ordinance for compliance with record drawing requirements.

Providing accurate system mapping is a long-term project. It is not feasible to identify all unknowns on a system of pipelines that are below grade; however, a structure can be set that will lead to more accurate and available record drawing information. A structure is being developed to lead to more accurate and available record drawing information. The structure includes the following:

- Identifying the location of key system features using GPS (in progress). The operation personnel will be equipped with tablets which will use a real-time kinetics (RTK) system to enhance accuracy and efficiency.
- Identifying dates of installation and improvements.
- Preparing a mapping system similar to that currently utilized by the CCWSD that would be available to all personnel using GIS (in progress).
- Maintaining wet-weather disposal capacity commensurate with treatment plant expansions through added DIWs when required.
- Enhancing the data conveyance process with CDES.

The CCWSD is currently preparing mapping of utility systems on these bases.

6.3.1.4.8 Pipe Relining

In the past, the CCWSD has acquired ownership of several smaller sewer systems operated by smaller private utilities. As a result, the CCWSD acquired several areas served by mostly clay pipe sewers. Infiltration of ground water will continue to be a problem in these systems. It is recommended that these areas continue to be inspected and relined as required.

6.3.1.5 Effluent Management

6.3.1.5.1 General

Effluent from the water reclamation facilities needs to be carefully managed to meet multiple goals. One goal that must be met is to dispose of or store irrigation quality water produced on a daily basis. Another goal is to supply irrigation customers with irrigation quality water or supplemental water when demand is the greatest; however, it is often a challenge to meet both goals. The supply of irrigation quality water is always the lowest, during dry weather, at the same time when irrigation quality water demand is the highest. The challenge is to reliably meet both goals. In addition, the CCWSD needs to have a means of disposal for irrigation quality water when the quality does not meet irrigation quality water standards.

The CCWSD currently uses membrane treatment to provide potable water to CCWSD water customers. Customers with no other source of irrigation water must irrigate with this highly treated water. It will be cost effective for the CCWSD to provide irrigation quality water to irrigation customers whose only other option is to use potable water. In addition, County ordinance requires that new residential developments install dual distribution systems, one system for potable water and the other for irrigation water. Thus, new developments will be "irrigation quality water ready", if irrigation quality water becomes available.

6.3.1.5.2 Number of Customers

The CCWSD currently has irrigation quality water customers, as discussed in Section 4 and a waiting list for additional irrigation quality water customers. Some of the existing customers are also served by private supplemental well water systems. The number of irrigation customers that the CCWSD has at any time must be carefully matched with the quantity of irrigation quality water and supplemental water available. The CCWSD must be careful not to over-commit to furnishing irrigation quality water and other irrigation water sources.

6.3.1.5.3 Irrigation Quality Water Rates

Irrigation quality water needs to be increasingly viewed as a valuable resource. Over the last several years, the recognition of the value of irrigation quality water has been growing. Several years ago, the primary goal in obtaining irrigation quality water customers was to develop a means of effluent disposal. This was true in the CCWSD and throughout the State. Today, irrigation quality water is widely accepted by the public for its value as an offset to more expensive potable water for irrigation. Some other communities are starting to raise the rates charged for irrigation quality water to reflect its value. It is recommended that irrigation

quality water rates be reviewed on a regular basis. An Irrigation Quality Water Master Plan will be completed in 2008. The CCWSD has developed an irrigation quality water policy, which will form the basis for the rates.

6.3.1.5.4 Irrigation Water Pressures

The CCWSD currently has a number of customers served at high pressure. Golf courses are typically supplied at low pressure where irrigation quality water is distributed into ponds for later application by the golf course operators. Generally, the discharge piping to the ponds consists of a pressure-sustaining valve and a float switch. The combination of high and low-pressure customers served by the CCWSD makes the system difficult to manage reliably. It is recommended that the CCWSD update and improve the irrigation quality water hydraulic model to focus on delivery at low pressure. If the CCWSD were only to fill storage ponds of customers, water could be delivered at any time of day and at low pressure. This would decrease the cost to deliver irrigation quality water and increase overall reliability. It is recommended that the CCWSD develop this model for delivery of irrigation quality water where possible as part of the Irrigation Quality Water Master Plan.

6.3.1.5.5 Backup Effluent Disposal

A reliable backup for effluent disposal is necessary for reliable effluent management. Backup disposal is needed in wet weather when storage for irrigation quality water may be full and demand is low or at times when the quality of irrigation quality water does not meet minimum standards. The CCWSD has DIWs at the NCWRF and SCWRF. The well capacity will allow the plants to dispose of the maximum month treatment capacity at each plant. Two wells are provided at each plant to increase reliability. It is recommended that the CCWSD use this pattern for the design of both future plants.

6.3.1.6 Biosolids Management

Neither the NCWRF or SCWRF has space available for stabilization facilities for biosolids, such as aerobic digestion. Dewatering at each site is currently available and is required for cost-effective transportation of the biosolids to a remote site for further processing or for disposal. All biosolids are currently trucked to the Okeechobee landfill. The Okeechobee Landfill is permitted by the FDEP. This may not be a long-term solution; however, WMI currently accepts the biosloids and it appears that they will continue to accept the biosolids for the foreseeable future. The plan for now is to continue to send biosolids to the Okeechobee Landfill.

The plan is to assure that a cost effective, sustainable biosolids management program gains BCC support and public acceptance with the development of a comprehensive biosolids management plan which includes:

- Biosolids production projections for all existing and planned WRF's
- Biosolids handling strategies
- Innovative technologies
- Investigate regional and local disposal alternatives
- Implementation plans

The following consideration will be included in a comprehensive biosolids management plan:

Customer Service Responsibility
- Plan for future
- Provide necessary services on-time, on-budget
- Maintain LOS

Good Neighbor Policy
- Improved odor abatement by reducing sources
- Clean, self contained facility

Environmental Stewardship and Compliance
- Full regulatory compliance and beyond
- Beneficial use of resources

6.3.1.7 Interconnections with Other Utilities

Irrigation quality water transmission systems can be interconnected with other systems in an effort to enhance reliability. This is recommended in the Regional Irrigation Distribution System (RIDS) report. The CCWSD could develop interconnections to irrigation quality water systems in the City of Naples and the Bonita Springs Utilities. It is recommended that such interconnections be considered carefully. Typically, the entire area will be under the same weather conditions and experience the same supply and demand stresses simultaneously. When the CCWSD demand for irrigation quality water is the highest, other communities will be experiencing similar demands. Considering this, interconnections should be pursued only where they can be done cost-effectively

6.3.1.8 Financial Sustainability

Financial sustainability is the backbone of responsible utility management, and is the "fuel" for system improvements. The utility must be able to manage capital assets, incur and pay off debt, and have an equitable means of collecting revenue.

As Master Plans are updated, the appropriate fee studies will be conducted to assess the financial impact. The Collier County Consolidated Impact Fee Ordinance No. 2001-13, as amended, requires the CCWSD to the review the capital plan and to conduct an Impact Fee study every three years at a minimum. Impact fees will be reviewed every three years or more frequently during periods changes in growth patterns. Previous Master Plan Updates have been used to serve as the bases of updated Impact Fees and Users Rates. During the years when new Impact Fee studies are required, it will be determined as to whether or not a master plan update is required. It is recommended that User Rate studies be conducted concurrently with impact Fee studies.

The CCWSD has adequate means and methods in place to monitor the financial feasibility of the various projects proposed in this Master Plan Update. Some of

these methods include performing the rate studies and impact fee conditions, testing the reasonableness of the projects' viability through a ten-year financial model and monthly monitoring of the continuous need and progress of the projects in the Project Review Board (PRB) meetings. In addition, cash-flow needs are monitored monthly.

The CCWSD maintains strong financial oversight of the Operating and Capital planning and execution on a monthly basis. This has the benefit of maintaining a financially viable utility and maintenance of the Fitch AA and Moody's Aa3 bond ratings achieved when the rating agencies visited the utility in Fall, 2006. The financial oversight takes a revenue centric approach and applies a series of key financial indicators to monitor the strength of the financial position of the utility. The key indicators are:

- Operating Margin – defined as total Operating Expense as a percentage of Gross Revenue before revenue reserves
- Fully Diluted Debt Coverage Ratio – defined as the amount of Net Revenue available to meet debt service payments
- Number of Days Cash Available – defined as the number of days of cash on hand available to meet operating expenses
- Pay Down Index – defined as the amount of cash estimated to be available after providing for current year expenses, debt service and reserves
- Revenues to Rate Study – defined as the total dollar and percentage of revenues compared to the revenues anticipated in the most recent rate study.

Asset management is important to a utility to maximize assets while minimizing the costs required to reliably meet customer needs. Through an asset management program the use of operation resources are improved and the utility is better able to forecast future expenses and provide optimal planning of capital for the benefit of the customers. The CCWSD has implemented the Antero maintenance software as a tool for asset management. This and other tools of the asset management system will facilitate the means for the CCWSD to collect data to meet Governmental Accounting Standards Board Statement 34 (GASB 34) requirements.

It is anticipated that the ongoing asset management program will optimize O&M and capital expenditures, thus facilitating the best allocation of financial resources. An effective asset management system will facilitate the utility's ability to set user rates that contemplate replacing the existing infrastructure based on expected useful life. This will facilitate avoidance of the potential for "rate spikes" due to unforeseen equipment breakdowns requiring high levels of uneven expenditures.

The asset management program will allow the CCWSD to take advantages of recapitalization of assets to increase the overall value of assets compared to a straight-line depreciation method. For instance, the pumping station improvements that the CCWSD is pursuing over time could be used in the asset management program to increase the overall value of assets on a systematic basis.

6.3.1.9 Planning

6.3.1.9.1 Master Planning

Master plans need to be living documents in areas that are experiencing rapid changes in growth, such as Collier County. The Master Plans for each of the CCWSD utilities are an encapsulation of plans and capital improvements that meet growth and fund replacement and reliability programs through the 20-year horizon. System requirements for both concurrency and reliability are more apparent in the near term than toward the end of the planning horizon. In planning projects, flexibility is needed to be able to "dial-up" or "dial-down" project development based on rapid changes in growth patterns.

Within one-year's time, growth estimates change, service areas change, service agreements change, and operating parameters change. It is important that the document be kept current. The Collier County Consolidated Impact Fee Ordinance No. 2001-13, as amended, requires the CCWSD to review the capital plan and to conduct an Impact Fee study every three years at a minimum. It is recommended that User Rate studies be conducted concurrently with the Impact Fee studies.

It is recommended that the CCWSD update the Wastewater Master Plan on a periodic basis in coordination with the concurrency management system described in Section 6.2 until such time that growth levels to some extent. Growth Management Plan elements pertaining to utilities, including the Sanitary Sewer Sub-element and the associated projects in the Capital Improvement Element, will be revised every seven years or more frequently, if necessary.

6.3.1.9.2 Seasonal Preparations

The highest wastewater flows typically occur during the late winter and early spring months. The CCWSD currently plans for this by performing maintenance that requires down time during times when wastewater flows are lower. This practice should continue and become a formal scheduled annual routine.

6.3.1.10 Asset Alignment and Verification

An asset alignment plan is included in the CIP to ensure that assets are properly aligned with divisional functions. The goals of the project are to check that plans and mapping for existing facilities are accurate, that facilities outside of existing rights-of-way are properly located within easements and all wastewater, water and IQ flows are properly billed. All easement descriptions and sketches, record drawings and billing records need to be consistent. In the future, this may merge with the Asset Management Program.

6.3.2 Information Management and System Communications

Information management requires a vision with clear goals, a strategy for implementation and control (management) of the data collected.

There are many new information management technologies available to advance and modernize the support and operation of the water and wastewater systems. The

three key areas where technology is used in water and wastewater systems are supporting the existing infrastructure, system operations and customer metering and billing. The CCWSD is at the forefront of new technology in all three of these areas with the use of fiber communications, GIS, LIMS, SCADA, Customer Relationship Management (CRM) and automatic meter reading. Continued investment in these areas will improve the system reliability, particularly with the advancement of the Asset Management program and pressures to optimize staff levels. A coordinated program approach will be required to ensure that system security is maintained and advancement of these technologies is on a converging path.

Improvements have been made within the Utility Billing and Customer Service areas through the implementation of InHance Utility Information Management System and Special Assessment System. These information management systems are significant improvements in the customer account, meter maintenance, and work order management areas.

Any technology employed must include enterprise-wide solutions to enhance meter-to-cash business processes. The integrated CRM Billing and Automatic Meter Reading technologies should enable a single enterprise view of customer information.

The existing InHance billing system should integrate seamlessly with information necessary to deliver an excellent customer lifecycle experience, providing:

- Automated Call Distribution (ACD) and Integrated Voice Response (IVR) systems for optimal inbound call center management
- Digital Work Order Systems to allow electronic visibility and control of the information flow between office and field staff
- Outbound calling for proactive contact with customers

Key Call Center support applications that can be human-assisted or automated self-service include:

- E-service used directly by end customers
- Field service applications to resolve customer's issues on-site
- Service analytics
- Workforce optimization

The SCADA system provides the CCWSD with a useful tool for system-wide communications and management. SCADA can provide the CCWSD with total asset visibility and trending. Expansion of the SCADA system may require real estate acquisition.

The CCWSD has been expanding the telemetry program, which expands capabilities and provides a real-time, reliable and efficient means of data acquisition. Real-time information is available from telemetry systems associated with pumping stations. Real-time and laboratory data is also available from the treatment facilities. These

processes allow the data to be available in such a way as to be used not only as a historical record, but also as monitoring, control and forecasting tools.

The goal of in-house data communication is to obtain a reliable and resilient system. An optical fiber cable network is the most resilient means of signal transmission and this system provides a high capacity. Reliability of the system is provided by the existing radio-telemetry system. Fiber will be the primary mode of signal transmission.

Installation of the fiber network is ongoing and is being managed by the IT Department. Other County Departments are sharing the network system. The status of the system installation is shown on Figure 6-1.

A summary of CCWSD goals, implementation strategies and data management for the information management system are described below:

1) Obtain redundant / resilient communications. Optical fiber cable (fiber) is the most resilient means of signal transmission. In addition, it increases communication capacity. Reliability already exists with the radio telemetry system; therefore, fiber will be the primary mode of signal transmission, with radio and telephone as the backup systems.
2) Improve response time to breakdowns. Anticipate and improve preventive or proactive maintenance. For example, remote control can improve both and make 80 percent of the responses a preventive (rather than a responsive) activity.
3) For security, allow all authorized CCWSD personnel to view and monitor any SCADA network.
4) For security, restrict control of operations to the appropriate operators, plant managers and Department Directors.
5) Link data reports to action and the Asset Management Program.
6) Develop fiber as the primary plant-to-plant communication with radio back-up.
7) Maintain radio as the primary means of communication to remote water distribution and wastewater pumping facilities and pumping stations, unless fiber is nearby.
8) Improve energy efficiency (FPL to assist), e.g. energy usage sub-metering.
9) Standardize systems and protocols.
10) Utilize appropriate, best value technology.

6.3.3 Risk Management Systems

Risk Management Systems allow for a set of systematic, economic and routine processes that effectively and efficiently reduces and/or eliminates financial loss, reduces and/or eliminates exposure and/or harm to people, property, process and the environment and prevents the degradation of service to customers or the quality of the products produced.

The following elements provide the framework of understanding that allow Risk Management Systems to function properly and help control loss exposure:

- Continuance of total management support and understanding that accidents, injuries, process and equipment failures are not inevitable costs of doing business.
- Adherence to and full implementation of existing and future Workplace Environmental, Safety and Health Policy, Programs and Procedures.
- Implementation and/or continuance of Quality Control Programs for facilities, equipment and processes.
- Continuance of management and employee education, training and support with regard to quality control and environmental, health and safety functions.
- Continuance of encouragement for employee communication with Utilities Management and Risk Management regarding environmental, occupational and public safety issues.
- Continuance of design team excellence involving cooperation between management, in-house and external engineering and Environmental Health Services (EHS) staff to produce safe, efficient and sustainable infrastructure.
- Continuance of the scrutinized selection of contractors and vendors chosen to design, build and service our infrastructure through competitive process, evaluation of EHS performance and adherence to insurance criteria.
- Adherence to existing and future environmentally friendly "green" strategies to help eliminate and/or reduce our environmental impact as infrastructure grows.

6.4 Summary and Conclusions

The CCWSD proactively plans its infrastructure and operations so that it reliably stays in compliance with regulatory requirements, meets the current and future flows and provides a sustainable utility for the future. The objective is to find the best value solutions through the right balance between reliable compliance and cost-effectiveness for CCWSD customers.

There are various projects in this Master Plan that are designed to achieve this objective, including improving reliability and sustainability of utility operations for hydraulic capacity and the wastewater organic strength treatment capacity. One example is the Compliance Assurance project at the NCWRF. While there is currently sustainable hydraulic capacity at the NCWRF, the organic strength of the wastewater that enters the NCWRF is higher than normal while the hydraulic peak flows are lower primarily due to lower than normal infiltration/inflow (I/I) and recent (last two years) weather patterns. Low I/I is beneficial to a wastewater utility, because it frees up hydraulic capacity in pipes, pumping stations and treatment plants. The NCWRF was designed for an average organic loading lower than what is being experienced. To ensure reliable treatment of this high-strength wastewater, the CCWSD is performing the Compliance Assurance Project and Bridge the Gap Project prior to any expansion to optimize our current assets. Details of these projects are found in Section 7.

Tools that can be used to help measure reliability are system-wide SCADA, benchmarking, and GIS systems to manage data. Benchmarking can provide an indication of the utility's capabilities and current limitations compared to other utilities having similar circumstances. A number of measurements have been discussed to determine how well the CCWSD is meeting its objectives, which are:

- Number of customer complaints.
- System outage reports.
- Supply of irrigation quality water to irrigation customers.
- Compliance with all permits.
- Reduction in quantity of water used for irrigation.

The CCWSD is already doing much of what is required to be a reliable utility. A number of additional actions are recommended in general and specific terms above. The recommended specific actions are summarized as follows:

- Develop an electronic O&M Manual, which can be updated on a regular basis.
- Conduct a CMOM self-evaluation in anticipation of upcoming regulations focused on preventing sanitary sewer overflows.
- Continue ongoing GIS system preparation, which will provide total asset visibility, making sure to focus on its value as a reliability measurement tool.
- Pursue means of long-term storage of irrigation quality water and provide supplemental supply sources to improve irrigation water reliability.
- Develop the asset management system to allow the CCWSD to meet CMOM and GASB34 requirements as well as to better determine the value of assets.
- Advance the LIMS, GIS, SCADA, customer information systems and asset management systems on convergent paths.

7 Alternative Wastewater Service Plans

7.1 Development of Alternative Projects

7.1.1 General

Wastewater service in the CCWSD will need to be provided in the future in the following areas:

- Existing sewered areas that develop further in the future.
- Existing developments currently with on-site septic systems (outside of Golden Gate Estates).
- New developments within the North and South Service Areas of sufficient density to require wastewater service
- The Orangetree area. (The CCWSD currently has an agreement to take over service of the Orangetree area in 2012.)
- Potential bulk wastewater sales to other utilities.

The potential service area includes the entire present Water-Sewer District and Orangetree (after 2012). In order to facilitate taking over service of the Orangetree area in 2012, the CCWSD should conduct an assessment of the existing system in 2009. This assessment should include an evaluation of various aspects of the system, including a financial analysis, process mapping, operations evaluation, and physical infrastructure analysis. The CCWSD will need to ascertain which components of the existing system may be incorporated into the CCWSD wastewater system. By completing this assessment in 2009, the CCWSD has two to three years to implement any corrective actions that may be required.

Service to Golden Gate City (FGUA) and the Golden Gates Estates area is not included in the 2008 Wastewater Master Plan. The density of dwelling units within the Golden Gate Estates will make sewer service relatively expensive for these customers. The CCWSD should provide service first in areas of greater potential population density, unless outside influences such as changes to septic tank regulations initiate a change to service area boundaries.

Wastewater treatment is currently provided to CCWSD customers by the NCWRF and SCWRF. The NCWRF was recently expanded to 24.1 MGD MMDF and the SCWRF to 16.0 MGD MMDF. The future expansion of the NCWRF to 30.6 MGD is planned to be placed in service by 2017. The design report for the SCWRF expansion to 16.0 MGD MMDF indicated that this capacity is the maximum that this plant site can support.

Wastewater flows are estimated in Table 5-1 for the CCWSD. Plant capacities and estimated wastewater flows are also shown in Table 5-1.

Two additional water reclamation facilities will be required in the planning period. Regional treatment plant capacity forecasts are based on:

- Projected wastewater flows and growth patterns.
- Effluent disposal and reuse issues.
- Economic analysis of operation, maintenance, and capital costs.
- Site-specific issues at existing plants.
- Fate of existing non-regional treatment plants.

7.1.2 Recommended Alternative

A Four-Plant Alternative with a master pumping station in the East Central Rural Fringe Area is recommended consistent with the 2005 Wastewater Master Plan Update. The existing and proposed water reclamation facilities and their service area boundaries are shown on Figure 7-1.

Under this alternative, all of the flow from the existing North Service Area would continue to be treated at the NCWRF. In addition, flow from new customers that are connected in the Northeast Area prior to construction of the proposed Northeast WRF (scheduled to be 2017) will be treated at the NCWRF. Flows from the Northeast Service Area will ultimately all be treated at the future NEWRF. Wastewater flows tributary to the Orangetree wastewater treatment plant will continue to be treated at the Orangetree plant until the proposed NEWRF is ready for service in 2017. Depending on the actual capacity of the plant and future flows to the Orangretree plant, some of the service area flow tributary to Orangetree may have to be temporarily diverted to the NCWRF until the NEWRF is ready for service. The wastewater from the future Southeast Service Area would be served by the proposed SEWRF. The SCWRF would continue to serve most of the South Service Area; however, some of the flow would need to be re-routed to the proposed SEWRF to avoid exceeding the SCWRF capacity. The East Central Master Pumping Station (MPS) would direct flow to the NCWRF for treatment. Real estate requirements associated with the recommended facilities shall be acquired as necessary.

The wastewater flows that could be treated at the plants proposed are calculated in Table 5-1. These facilities are all designed to meet or exceed the reliability requirements of the "Recommended Standards for Wastewater Facilities, latest Edition", as Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (Ten States' Standards). All plant capacities are therefore reliable capacities. The facilities and capacities are presented and summarized as follows:

Chart 7-1
2012 and 2027 Maximum Month Daily Flows and Capacities, MGD (1)

Plant	Recommended Plan			
	2012 MMDF	2012 Capacity	2027 MMDF	2027 Capacity
NCWRF	15.4	24.1	21.2	30.6
SCWRF	13.3	16.0	15.6	16.0
NEWRF	0	0.0	3.8	4.0
SEWRF	0	0.0	4.4	6.0
TOTALS	28.7	40.1	45.1	56.6
(1) Source: BEBR Bulletin 150 dated March 2008 and Table 5-1				

The NCWRF is a regional treatment facility centrally located within the North Service Area. It is one of the most critical facilities, if not the most critical facility, of the entire wastewater system. As such, this facility must be 100 percent reliable and fully compliant with all regulations. The current plant capacity is 24.1 MGD MMDF. The expansion of the plant to 30.6 MGD MMDF is proposed in three phases as described below. The schedule for completion of the plant expansion is shown throughout the Master Plan Update to be completed in 2017; however, the Consent Order from the FDEP requires that the plant be completed not later than December 31, 2015. The required plant capacity is based on population, per capita wastewater flows and wastewater strength (ammonia and BOD organic loadings). All of these parameters are monitored closely. Regularly scheduled meetings (at least annually) are proposed with the FDEP starting in June 2008 to discuss the status of the NCWRF capacity. The flows and treatment parameters will also be reported to FDEP on a quarterly basis. The three phases of the NCWRF expansion are as follows:

1. Compliance Assurance Project – To construct the necessary facilities to bring the NCWRF to 100 percent compliance for all regulatory requirements, including IQ water requirements.

2. Bridge the Gap Project – To construct the necessary facilities required to provide treatment to match the measured increase in organic (ammonia and BOD) loadings to the plant.

3. Expansion to 30.6 MGD MMDF – To construct the necessary facilities to increase the treatment capacity from 24.1 MGD to 30.6 MGD MMDF.

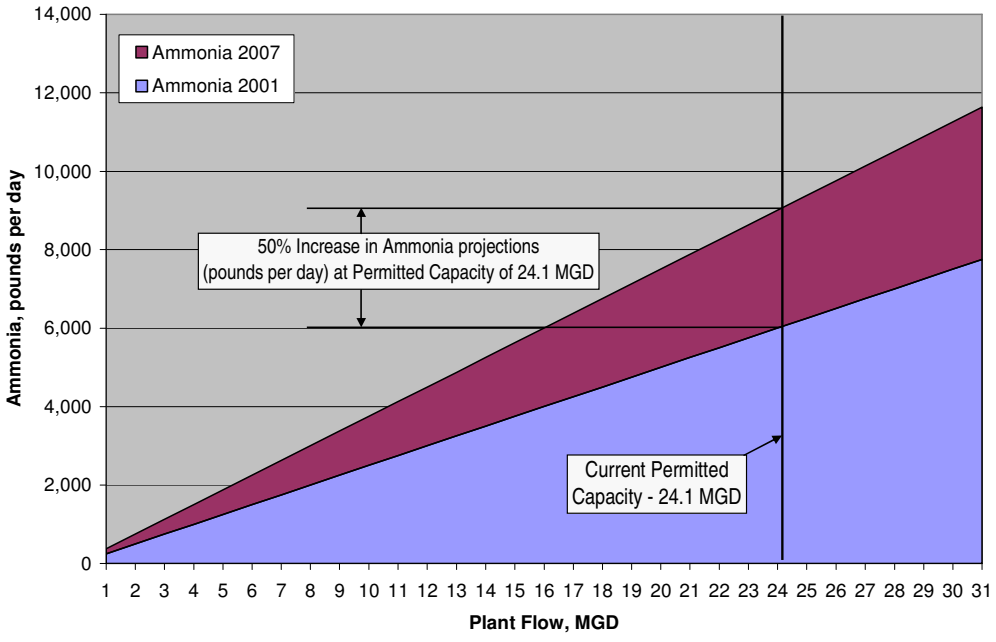
The following is a summary of the general scopes and schedules of work for each phase:

Compliance Assurance Project - On Line FY 2011

The Compliance Assurance Project includes the following:

- Installation of impermeable lining in Effluent Ponds Nos. 2 and 4. The lining will prevent the loss of stored effluent by percolation to ground water and increase the amount of reclaimed water available for distribution to customers. Furthermore, it will prevent any potential groundwater interference with background water quality.
- Installation of fill material in the west portion of Effluent Pond No. 2 to allow construction of the proposed EMS Building and storm water retention ponds in later phases.
- Modifications to subdivide the existing strainer backwash pond into two sections to allow one of the pond sections to stay in use while the other section is drained and maintained.
- Modifications to effluent piping to allow circulation of effluent through Ponds 3, 4 and 5, to prevent formation and subsequent treatment of algae during long periods of reclaimed water storage.
- Inspection and restoration of perimeter berms for all effluent storage ponds.
- Purchase and installation of additional process air blowers and piping for the MLE activated sludge process to provide additional reliable capacity as influent loading concentrations increase. (See Chart 1 below - Ammonia NH3)
- Construct Compliance Points Appurtenances to allow closer monitoring to ensure fully compliant IQ water.

Chart 1
Wastewater Strength Increase (Years 2001 to 2007) Ammonia (NH3)



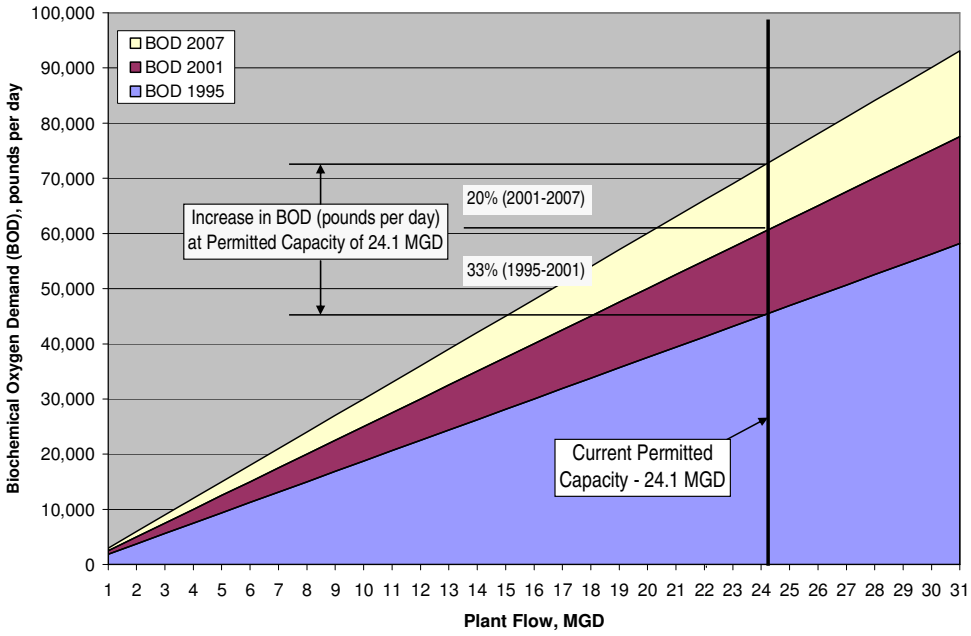
The flows and treatment parameters will continue to be monitored and reported to FDEP to determine the actual schedule for the following phases. The current schedule in the CIP is to complete the next phase (Bridge the Gap Project) by FY 2014.

Bridge the Gap Project - On Line FY 2014

The Bridge the Gap Project includes the following:

- Construction of Flow Equalization System No. 3, including a 1.5 million gallon storage tank, return and tank mixing pumps, aeration blowers and piping, odor control system and ancillary items.
- MLE Aeration Blower Building No. 2 with two (2) process air blowers, piping, electrical, instrumentation and controls work. (See Chart 2 below – Biochemical Oxygen Demand for wastewater strength capacity needed).
- Aerated Sludge Holding Tanks 2A/2B, including process air blowers, sludge transfer pumping, electrical and instrumentation work. (See Chart 2 below – Biochemical Oxygen Demand for wastewater strength capacity needed).
- Odor Control additions and upgrades, as follows:
  a. Extension of covers to contain odors over a larger portion of the existing 12 MLE Aeration Basins.
  b. A new wet scrubber system consisting of two single-stage wet scrubbers to serve the 12 existing MLE Aeration Basins and six future MLE Aeration Basins.
  c. Relocation of existing MLE Aeration Basins biofilter to serve the existing Pretreatment Building.
  d. A new two-stage wet scrubber system to serve as a standby unit to both the Pretreatment Building biofilter and the existing Sludge Storage wet scrubber system.
- Electrical reliability upgrades to Electrical Service No. 1 and its power distribution system to meet Collier County/FDEP Class 1 electrical reliability standards. Fate of existing non-regional treatment plants.
- Conversion of MLE Aeration Basin "swing zones" to permanent aerated zones by replacing jet aeration/mixing equipment with diffused aeration equipment.
- Installation of new piping and motorized valves within the effluent disposal system to increase the number of effluent permit compliance points from two (Chlorine Contact Basins 1-2 and Chlorine Contact Basins 3-5) to five (one each for Chlorine Contact Basins 1, 2, 3, 4 and 5).

Chart 2
Wastewater Strength (Years 2001 - 2007)
Biological Oxygen Demand (Organic Content)



During construction of the Bridge the Gap Project, the flows and treatment parameters will continue to be monitored and reported to FDEP. The schedule for completion of the next phase (Expansion to 30.6 MGD) needs to be coordinated with FDEP based on plant flows and overall plant performance with regard to permit compliance.

Expansion to 30.6 MGD Project – Completion to be determined based on actual flows, results of earlier phases and negotiations with FDEP. Completion currently shown to be FY 2017.

The Expansion to 30.6 MGD Project includes the following:

- Pretreatment Facility expansion, including Mechanical Screen No. 5, Aerated Grit Chamber No. 5, pretreatment bypass channel, and ancillary items.
- Six (6) new MLE Aeration Basins, including concrete tanks, diffused aeration systems, vertical mixers, mixed liquor recycle pumps, a new Aeration Influent Mixing Box, piping, electrical, instrumentation and controls work.
- Two additional MLE Aeration Blowers in Blower Building No. 2.
- Two new MLE Clarifiers (Nos. 10 and 11), Sludge Pump Station No. 5, Scum Pump Station No. 3, and ancillary items.
- Two new MLE Effluent Filters (Nos. 6 and 7) and Chlorine Contact Tanks (Nos. 6A, 6B, 7A, and 7B), including additional hypochlorite feed pumps/piping.
- Reclaimed Water Pump Station No. 2, including building structure, wet well, vertical turbine pumps, electrical, instrumentation and controls to integrate the new pump station with existing Reclaimed Water Pump Station No. 1.

- Installation of Belt Press No. 6 and ancillary equipment (sludge feed pumps, polymer feed systems) into the existing Sludge Dewatering Building.

Based on the flows developed in Section 5 of this Wastewater Master Plan Update, the dates in which the new facilities would need to be placed in service are shown on Chart 7-2. Any infrastructure required to transport wastewater from the service area to the facility being constructed would also need to be in place.

Chart 7-2
Estimated In-Service Dates for the Recommended Plan through 2027 (1)

Plant	Constructed Capacity – Initial Construction/Expansion (MGD - MMDF)	Date to Be Placed in Service	Total Facility Capacity (MGD – MMDF)
NCWRF	6.5 - Expansion	2017	30.6
NEWRF	4.0 – Initial Construction	2017	4.0
SEWRF	4.0 – Initial Construction	2022	4.0
	2.0 - Expansion	2026	6.0
(1) Source: Table 5-1			

In previous master plans it was assumed that buildout populations (and flows) occur in 2030. CCCPD only provides population forecasts through 2029. In 2004, a draft buildout population study was prepared by CCCPD, but not adopted. Population growth rates (and thus wastewater flows) are significantly lower in this master plan than in previous master plans and AUIR's.

In the 2005 Wastewater Master plan Update, the buildout wastewater flow in the Water-Sewer District was estimated to be approximately 85 MGD MMDF. It is recommended that the buildout wastewater flow still be considered to be 85 MGD MMDF. The buildout date is estimated to be well beyond the 2027 planning period of this master plan. There is sufficient plant site area with the four plants to support the buildout capacity.

Should the nature of any of the CCWSD service areas change, the capacities listed and/or number of treatment facilities may need to be re-evaluated.

7.2 Summary of Other Wastewater Issues

7.2.1 Service to Existing Areas Served by Septic Tanks

Collier County is generally low-lying with high groundwater levels and is in general not an ideal location for septic tanks. However, many septic tanks serve residents of the CCWSD where sewer service was not available at the time of construction of individual homes. Sometimes septic tanks are the only means available to serve the wastewater treatment needs for the individual. Areas with low housing densities,

such as Golden Gate Estates, may be particularly costly to serve with sewers, since such areas would have fewer homes per length of sewer.

The future population of the areas currently unsewered are estimated within this 2008 Master Plan Update. Collection system projects to serve unsewered areas are not included in the master plan. Unless adverse environmental impacts are demonstrated to exist, septic systems can be a viable wastewater disposal method over the long term subject to proper use, maintenance and inspections. In areas where conditions are more adverse, septic systems may fail and sewer service may be needed.

7.2.2 Effluent Disposal Issues

The CCWSD is required by permit to use irrigation with irrigation quality water as the primary means of effluent management. Use of deep well injection is recommended as the backup. The CCWSD already has much of the required infrastructure in place in the North and South Service Areas and there is great potential for irrigation within the CCWSD.

The CCWSD has developed an irrigation quality water policy to be followed by an Irrigation Quality Water Master Plan. The goals of the Irrigation Quality Water Master Plan are to update irrigation quality water strategies developed in the previous 2002 Wastewater Resources Planning Report (Camp Dresser & McKee, October 2002), including updates to irrigation quality water availability and irrigation quality water demand forecasts, project costs and schedules, and maps to show updated irrigation quality water projects. Another goal of the study is to develop irrigation quality water strategies that are consistent with the South Florida Water Management District Lower West Coast Water Supply Plan 2005-2006 Update, including possible interconnections with irrigation quality water systems operated by others.

Conclusions and recommendations regarding irrigation quality water issues will be included in the Irrigation Quality Water Master Plan.

DIWs should be utilized as the secondary means of effluent management. DIWs would be used only when irrigation quality water failed to meet standards or, in wet weather, when storage is full and customer demand for irrigation quality water is low.

The DIWs at the NCWRF also improve the ability to maintain regulatory compliance. Water quality standards for public-access irrigation quality water are strictly enforced. Effluent quality is continuously monitored for compliance. Whenever effluent quality approaches, or goes outside acceptable parameters for irrigation quality water, the effluent needs to be immediately diverted to designated on-site storage ponds. The injection wells improve reliability by providing an alternate means of effluent disposal in the event that the designated storage ponds are full.

Both the NCWRF and SCWRF have two DIW's that provide 100 percent reliable capacity for effluent disposal.

It is recommended that all new plants to serve the new service areas also include DIWs for effluent disposal as a backup to irrigation.

7.3 Force Mains and Pumping Stations

The CCWSD existing WaterGEMS hydraulic model of the force main system has been used to evaluate maintaining the CCWSD LOSS for the wastewater transmission and pumping system. The model was updated for this Master Plan Update.

The annual average wastewater flow for calendar year 2007 was entered into the model based on the CCWSD billing records for that period. Billing records for the various classes of customers were obtained from the County. These billing records were matched to specific parcel locations based on billing addresses. The total actual flow for calendar year 2007 was allocated to the accounts based on the proportion of the total flow that each account had contributed. This methodology accounts for existing commercial and industrial flow contributions based on their actual flow contribution, at their actual locations. Sub-areas were developed for the CCWSD service areas, corresponding to the sewered area (sewer sheds) associated with the wastewater lift stations. The CCWSD force main and pumping station network was overlaid on the parcel map with sewer sheds and wastewater flows and the 2007 flows assigned to sewer sheds.

Flows for the years 2008 and beyond were allocated into the model based on population multiplied by the per capita flow contribution specific to the sewer service area. The per capita flow contribution includes a residential and commercial flow component. Population projections obtained from CCCPD were first disaggregated into Traffic Analysis Zones (TAZs). The disaggregation assigned population first to TAZs closest to projected build-out until the build-out condition was matched, on a year-by-year basis for the planning period. For the initial period (years 2008 through 2011), the additional wastewater flow within each TAZ was allocated to areas of existing development (sewer sheds), based on their proportion of the total wastewater flow for the TAZ. For 2012 and subsequent years, the additional wastewater flow was assigned to developable (but currently undeveloped) area within the TAZ. The CCWSD force main and pumping station network was overlaid on the TAZ map. Demands in existing sewer sheds were assigned to the pumping station associated with the sewer shed. In areas that will receive future flows, but which are not currently sewered, flows were assigned to nodes on the force main system within each TAZ. Additional tools used to assign flows for future conditions included recent aerial photographs, the current Planned Unit Developments map, and development schedules as provided by Community Development and Environmental Services (CDES).

In summary, the basis for determining the flows to each existing pumping station or force main node representing a future flow is as follows:

- Existing flows (2007 calendar year) were assigned to the model based on actual flows.
- Future annual average flow projections were based on population estimates described in Section 5.
- Per Section 5, annual average per capita flow rates are different for the wastewater service areas in the CCWSD. The per capita flow rate specific for the service area was used for calculating the annual average flow.
- A peaking factor was applied to the average flow to determine peak hourly flow used for modeling. The peaking factor was determined based on the equation shown in Section 5.4.
- The hydraulic model was employed for the 2017 and the 2027 conditions for the wastewater service areas.

The wastewater flows were assigned to individual pumping stations or force main nodes by year. These values were used for the hydraulic model. Appendices C, D and E present the results of the wastewater system hydraulic analysis for the modeling years 2007, 2017 and 2027 respectively.

For the hydraulic analysis of the wastewater transmission system, the existing CCWSD WaterGems model was utilized. This model included design factors for the pump stations and transmission mains. For pump stations, the following performance details for each qualifying (usually 10 hp and larger) station were typically included in the model:

- Pump capability information: Manufacturer, number of pumps, horsepower rating, impeller size and performance curves
- Pump discharge main size and elevations
- Pump station wet well size and operating elevations

Smaller pump stations not included in the model were assigned as inflows into the system.

Several factors used in determining adequate pump station capacity were assumed, based on discussions with CCWSD staff and previous model development:

- Pump "off" elevation 2-ft above wet well invert elevation
- Minor losses calculated using *Cameron Hydraulic Data* for typical wastewater pumping station piping configuration.

Transmission main performance was analyzed in the model using the Hazen-Williams equation. This equation is commonly utilized to estimate head loss in pipes, taking into account pipe size, length, fluid velocity and piping material. Piping material was assigned a roughness coefficient, referred to as the "C" factor, as follows:

Chart 7-3
Roughness Coefficient by Pipe Diameter

Pipe Diameter (inches)	"C" Factor
4 – 16	115
20 – 48	125

These factors are commonly used values in the design of wastewater transmission mains. This combination of design factors was used to assess the capability of the CCWSD wastewater collection system under several conditions.

The transmission systems of the North and South Service Areas are organized differently. The system in the North Service Area includes numerous smaller pumping stations discharging into manifolded force mains. The system typically generates high transmission main velocities and requires high-head pumps for the smaller stations. For the North Service Area, a high-head hydraulic analysis was performed assuming all pumps (except standby pumps) operating with a low water level in the wet well. High head model runs were evaluated to determine if pump stations could pump 60 percent of the peak flows with all pumps running. Stations not meeting these criteria are recommended for improvement.

The South Service Area is organized such that smaller pumps stations discharge into larger Master Pump Stations. These Master Pump Stations typically discharge into manifolds going to other Master Pump Stations, so transmission main velocities are generally less than in the North Service Area, resulting in lower-head pumps in the smaller stations. In addition to the high-head condition described for the North Service Area, a low-head hydraulic analysis was performed for the South Service Area. The low-head condition was analyzed assuming a single operating pump in the manifold. The low-head condition was evaluated to determine if pumps operating alone would exceed pump run-out conditions. A low-head model run was not necessary for the North Service Area due to the large number of pumps included in the manifold and the low probability that one pump would be operating alone.

In addition to pump stations, transmission main velocities were analyzed. The general criteria established for evaluation was as follows:

- Minimum velocity of 2.0 feet per second to prevent solids from accumulating in the pipes.
- Maximum velocities of 7.0 feet per second to avoid scour and large head loss conditions which result in high operating costs.

Transmission mains evaluated to be outside these parameters were recommended for improvement.

The recommended wastewater treatment and pipeline improvements resulting from application of the hydraulic model are reported in Table 7-1. The pumping stations identified in Appendices C, D and E are potentially deficient based on the modeling

assumptions, but actual improvements should be based on more detailed analysis of actual operation or more detailed hydraulic modeling.

The pumping system configuration and force main interconnections modeled are shown on Figure 7-2. Figure 7-3 (in the pocket in the back of the binder) shows the recommended system improvements that are necessary to improve system hydraulics and to assure sufficient capacity is available. The newly constructed 20-inch transmission main connecting the North and South Service Areas is also shown on Figure 7-2 together with the transfer pumping station. This increases system reliability by allowing flow to be transferred between the boundaries of the North and South Service Area. This allows the CCWSD to transfer flow away from either plant to where capacity may be available. All new and improved pumping stations and transmission lines are to be designed in accordance with the reliability requirements of the Ten States' Standards.

7.4 Timing Milestones

The point at which new facilities will be required is difficult to determine with certainty. This 2008 Wastewater Master Plan Update covers the period from 2008 through 2027. Within this report, years have been shown as projections of when certain populations or wastewater flows may be obtained. Regarding timing, it is not so much the dates that are important, but rather milestones. When certain events occur, the CCWSD will need to react with a facility out of the 2008 Wastewater Master Plan Update. For example, certain pipelines are proposed to interconnect systems. The timing for such a pipeline may be triggered by a road construction project as much as by a need for the pipeline to meet an immediate collection or transmission system demand.

Many growth-related projects, such as the NEWRF, have been deferred due to the recent slowndown in population growth. If the population growth rates increase, the CCWSD needs to be in a good position to accelerate these projects, if required. For example, the NEWRF is currently shown to come on-line in 2017. The schedule for completion of this project could easily be accelerated by up to four years if the rate of growth increases. The next required treatment capacity for future growth will be the expansion of the NCWRF and the new NEWRF. If populations begin to increase faster than currently projected, the CCWSD already has a Northeast Program Manager in place and will have signed and sealed plans and specifications by December 2008 for the NEWRF design. The plans may need to be updated. The Northeast Program Manager will develop a "Hibernation" plan by December 2008 for the Northeast Program projects to document the suspension point in the development process. The "hibernation" plan will also include a reactivation schedule describing the activities required to restart the development process of these facilities. The design for the expansion of the NCWRF to 30.6 MGD and the design for the NEWRF both need to be complete far enough in advance to allow for a three-year construction period. The required capacity and growth rates will be monitored through the AUIR process.

A typical schedule for construction of a new water reclamation facility is about eight years from initial planning to completion of construction, including three years for

conceptual design, siting and land acquisition; two years for preliminary and final design and permitting; and three years for bidding and construction. Therefore, expenditures of capital to develop a new facility need to occur several years before the new facility is placed in service. In addition, FDEP regulations require that expansions of existing water reclamation facilities adhere to a certain schedule. These requirements are summarized in Chart 7-4.

Chart 7-4
FDEP Requirements for Water Reclamation Facility Expansions (1)

Flow Condition	FDEP Submittal Requirements
Flows will equal or exceed permitted capacity within the next ten years	Submit updated Capacity Analysis Report annually
Flows will equal or exceed permitted capacity within the next five years	Submit signed and sealed statement that planning and preliminary design have been initiated
Flows will equal or exceed permitted capacity within the next four years	Submit signed and sealed statement that plans and specifications are being prepared
Flows will equal or exceed permitted capacity within the next three years	Submit construction permit application within 30 days of submittal of Capacity Analysis Report
Flows will equal or exceed permitted capacity within the next six months	Submit application for an operation permit for expanded facility no later than submittal of Capacity Analysis Report
(1) Source: Rule 62-600.405, FAC	

Timing of treatment facilities to serve the Rural Fringe area (new service areas) will be triggered by development. Plants in the Rural Fringe area will need to be constructed only as required to serve new development.

Recommendations are made in Section 5 to use the population projections to provide the range of wastewater flow projections for the 2008 Wastewater Master Plan Update.

CCCPD developed updated estimates of Water-Sewer District populations. These estimates were updated based on BEBR Bulletin 150 dated March 2008 and incorporated into the population projections developed in Section 5.

Flow is allocated to each treatment facility based on the service area map for the Four-Plant Alternative. The estimate by year of the Master Plan Growth estimate of wastewater for the four plants is shown on Table 5-1. The estimated wastewater flow range by year for each proposed plant is shown on Figures 7-4, 7-5, 7-6 and 7-7. The figures compare the expected wastewater flow with the recommended capacities. The capacities indicated need to be matched with the expected flows on a

periodic basis to make sure that the population increases and the associated wastewater flows are matching targeted values. These figures show the year in which the shown capacities need to be in service.

8 Capital Improvement Program for Wastewater

The Capital Improvement Program (CIP) has been developed to include the projects necessary to implement the recommended wastewater programs to allow the CCWSD to reliably maintain the existing infrastructure and respond to future growth. In order to reflect the recent slowdown in growth, many growth-related projects, such as the NEWRF, have been deferred. If the population growth rates increase, the CCWSD is in a good position to accelerate these projects, if needed. For example, the NEWRF is currently shown to come on-line in 2017. The schedule for completion of this project could easily be accelerated by up to four years if recent growth patterns change.

A list and description of the wastewater CIP projects is provided in Table 8-1. The five-year CIP, Fiscal Year (FY) 2008 through FY 2013, is presented in Table 8-2 and the twenty-year CIP, FY 2014 through FY 2027, is presented in Table 8-3.

The CIP represents a comprehensive list of projects based on known conditions and projected future conditions. Due to potential unforeseen conditions, not every future project can be identified at this time. For example, natural disasters or unanticipated equipment failures could result in the need for additional projects.

No contingency costs are included for projects from FY 2008 through 2013. Ten percent contingency costs are applied to the total project costs for FY 2014 through 2017. Twenty percent contingency costs are applied to the total project costs for FY 2018 through 2027. Contingency costs are not applied to the projects shown on page 8-3, since these projects have a higher degree of cost certainty.

A description of the basis for development of Tables 8-2 and 8-3 is presented below:

Table 8-2:

- The project costs for FY 2008 through FY 2013 projects are shown in the fiscal year when the costs will be incurred by the CCWSD.
- The costs for each project are shown by year and by functional category for wastewater treatment, wastewater transmission, wastewater collection and irrigation quality water.
- Project costs related to growth are shown as Impact Fee (Fund 413) costs. Examples include new water reclamation facilities and water reclamation facility expansions to meet the needs of growth. Project costs associated with renewal and replacement of existing assets are shown as User Rate (Fund 414) costs. An example would be rehabilitation of existing pumping stations. Costs for some projects include both growth-related costs (Fund 413) and renewal and replacement costs (Fund 414). Examples of these projects include upgrades to existing transmission mains or pumping stations that will serve both existing and new customers.
- Costs shown for FY 2008 correspond to the current budget, including proposed budget amendments.

- Costs for future years have been developed based on input from Public Utilities Division Project Managers, Operations staff and calculated costs for proposed projects.
- No contingency costs are applied to the total costs for FY 2008 through FY 2013 projects.
- All costs are in 2008 dollars escalated at 8 percent per year.
- Costs for studies have been provided by PUD project managers based on costs for previous similar studies.
- Costs for land acquisition have been based on recent property appraisal data from the CCWSD. The costs of the County's Real Property Management staff time are included in the budgets of applicable projects.
- Pipeline costs are shown with a typical allowance of one year for design and permitting and one year for construction. Typical pipeline unit construction costs were used based on recent bid prices for CCWSD projects. The unit costs used include costs for valves, maintenance of traffic, surface restoration, road crossings and miscellaneous appurtenances. Where special construction features, such as interstate or large road crossings are anticipated, additional costs have been included for these items. Engineering costs for pipeline design and services during construction are based on twenty percent of construction costs.
- Costs for new water reclamation facilities, water reclamation facility expansions, and pumping stations have been based on recent similar costs for these projects in Collier County. Unit costs were developed for each of the major components for pumping station and plant construction. For water reclamation facility construction (both new plants and plant expansions), costs have been assigned based on design and permitting in one or two years and three years for construction. Thirty percent of the construction costs are assigned in the first year, fifty percent in the second year and twenty percent in the third year. Engineering costs are based on fifteen percent of the construction costs.

Table 8-3:

- Project costs for FY 2014 through FY 2027 are shown increments for FY 2014 – FY 2017, FY 2018 - FY2022, and FY 2023 - FY 2027. Costs are shown within the incremental period when the costs will be incurred.
- The costs for each project are shown by year and by functional category for wastewater treatment, wastewater transmission, wastewater collection and irrigation quality water.
- Project costs related to growth are shown as Impact Fee (Fund 413) costs. Examples include new water reclamation facilities and water reclamation facility expansions to meet the needs of growth. Project costs associated with renewal and replacement of existing assets are shown as User Rate (Fund 414) costs. An example project would be rehabilitation of existing pumping stations. Costs for some projects include both growth-related costs (Fund 413) and renewal and replacement costs (Fund 414). Examples of these projects include upgrades to existing transmission mains or pumping stations that will serve both existing and new customers.

- Costs for future years have been developed based on input from Public Utilities Division Project Managers, Operations staff and calculated costs for proposed projects.
- Project costs are presented in 2008 dollars with an eight percent annual inflation after 2008.
- Ten percent contingency costs are applied to the total costs for FY 2014 through FY 2017 projects and twenty percent contingencies are applied to the total costs for FY 2018 through FY 2027 projects. There are four Fund 413 and eight Fund 414 projects for which no contingency costs are applied to the total costs in Table 8-3 as follows:

Project Number	Fund	Project Description
73156	413	NEWRF 4.0 MGD Plant
73950	413	NCWRF Expansion to 30.6 MGD
2008-1	413	SEWRF 4.0 MGD Plant
2008-3	413	SEWRF 2.0 MGD Expansion

Project Number	Fund	Project Description
72505	414	Security Upgrades
73050	414	Sewer Line Rehabilitation
73082	414	Pump/Lift Station Replacement
73950	414	NCWRF Expansion to 30.6 MGD
73922	414	Wastewater Collections System SCADA/Telemetry
73968	414	NCWRF Technical Support Projects
73969	414	SCWRF Technical Support Projects
2008-15	414	NEWRF Technical Support Projects

  Contingency costs have not been included for these projects since there is a high degree of confidence in the costs or that these projects are repetitively funded annually to meet the same requirements and they are expected to have a low variance of costs. This is consistent with the 2005 Master Plan Update.
- The same unit costs were used in the development of Table 8-3 as used for Table 8-2.

9 Summary and Recommendations

The BCC has identified *Growth Management* as one of their six strategic focus areas in the in the 10-Year Strategic Plan. The CCWSD has developed operational and tactical business plans nested and aligned with the BCC strategic plan. The CCWSD has identified strategic elements of the Growth Management Plan, the Annual Update and Inventory Report, and the Land Development Code; together with regulatory compliance obligations and BCC-directed Levels of Service to develop this Wastewater Master Plan Update. Given the nature and time required to develop wastewater capacity infrastructure, the CCWSD has adaptively looked beyond this 10-year period. Having a vision of the CCWSD mission in the next 20-year time frame enables planning for optimum best value solutions.

Collier County faces the challenges of providing wastewater services consistent with changes in the number of customers. Population growth within the County from 1990 to 2000 was about 65 percent. Growth from 2000 to 2006 continued at a very high pace. Starting in 2007, there was a dramatic decrease in growth compared to previous years.

Population projections have been provided by CCCPD and updated based on BEBR Bulletin 150 dated March 2008. The vision developed in this 2008 Water Master Plan Update is for four plants to serve the ultimate wastewater treatment needs of the wastewater service area. The four plants include the two existing water reclamation facilities that the CCWSD owns and operates and two additional facilities as shown on Figure 7-1. By looking out to the ultimate configuration of the CCWSD infrastructure, intermediate goals can be developed consistent with the ultimate plan.

This Master Plan Update provides short-term and long-term planning that proposes technically sound, cost-effective improvements that will ensure compliance with governmental regulations.

The planning period for this Master Plan Update is 20 years through 2027. There are two proposed Capital Improvement Plans, a six-year and a 20-year plan. The six-year plan is more reliable, because there is more of an understanding of growth projections and land development for the short term. While the 20-year planning is less reliable, it is still useful for land acquisition, conceptual facilities planning, cost estimating and financial planning for the long term.

The proposed facilities include improvements to the two existing treatment plants and two proposed plants that will be located in the future Northeast and Southeast Service Areas. A master pumping station with pretreatment facilities will be located in the East Central Service Area. This recommendation is shown on Figure 7-3 (in the pocket in the back of the binder).

The following are recommendations for capital improvement projects over the 20-year planning period:

1. Wastewater Treatment

FY 2008-2013:

- Complete final design, permitting and construction of the Compliance Assurance project at the NCWRF (2011).
- Complete final design, permitting and start construction of the Bridge-the-Gap project.
- Complete irrigation quality water ASR well and perform cycle testing.
- Conduct assessment of the Orangetree WWTP.
- Design, permit and construct any necessary repairs or capacity enhancements at the Orangetree WWTP.
- Identify and acquire property for SEWRF.

FY 2014-2017:

- Complete construction of the Bridge-the-Gap project (2014).
- Complete final design, permitting and construction for the NCWRF Expansion to 30.6 MGD MMDF (2017).
- Complete final design, acquire necessary real estate, permitting and construction of the Northeast WRF to 4.0 MGD MMDF (2017).

FY 2018-2022:

- Complete preliminary design, final design, permitting and construction of the Southeast WRF to 4.0 MGD MMDF (2022).

FY 2023-2027:

- Complete final design, permitting and construction for expansion of Southeast WRF to 6.0 MGD MMDF (2026).

2. Wastewater Collection and Transmission

FY 2008-2013:

- Complete the Vanderbilt Beach Road force main and activate new master pumping station at Vanderbilt Beach Road and Logan Boulevard.
- Complete installation of telemetry to all existing pumping stations.
- Continue to rehabilitate pumping stations and collection systems.
- Conduct assessment of Orangetree wastewater system, including physical infrastructure, to identify any required corrective actions.
- Implement any corrective actions required by assessment to facilitate provision of service to Orangetree.
- Provide wastewater service to Orangetree.

FY 2014-2017:

- Construct new master pumping stations along Immokalee Road associated with the expansion of Northeast WRF and acquire real estate as necessary.

- Continue to rehabilitate pumping stations and collection systems and acquire real estate as necessary.
- Acquire real estate as necessary for the East Central Master Pumping Station.

FY 2018-2022:

- Construct new East Central Master Pumping Station and Pretreatment Facility.
- Construct regional interconnection from the South Service Area to the Southeast Service Area and associated master pumping station, and acquire real estate as necessary.
- Continue to rehabilitate pumping stations and collection systems and acquire real estate as necessary.
- Improve pumping station capacities as described in Section 7.
- Improve transmission force main capacities as described in Section 7.

FY 2023-2027:

- Continue to rehabilitate pumping stations and collection systems and acquire real estate as necessary.
- Improve pumping station capacities as described in Section 7.
- Improve transmission force main capacities as described in Section 7.

3. Biosolids

FY 2014-2017:

- Prepare short-term and long-term biosolids management plan and implement biosolids management program.

4. Irrigation Quality Water

FY 2008-2013:

- Complete Irrigation Quality Water Master Plan.
- Add irrigation quality water transmission pipelines to improve system capacity, pressure and reliability, and acquire real estate as necessary.
- Begin construction of ASR irrigation quality water wells.
- Add additional customers as sufficient irrigation quality water is available.

FY 2014-2017:

- Implement recommendations made in Irrigation Quality Water Master Plan.
- Complete final design and permitting and construction of irrigation quality water pumping station to enhance flow transfer capacities between the NCWRF and SCWRF.

FY 2018-2027:

- Implement recommendations made in the Irrigation Quality Water Master Plan.

5. General

FY 2008-2013:

- Develop asset management program.
- Complete easement / ROW evaluation and asset alignment studies.
- Identify and acquire real estate and easement rights as appropriate and necessary to support current and future requirements.

Ongoing:

- Update the wastewater master plan and impact fee and rate analyses at a minimum of every three years.
- Continue to expand SCADA and GIS systems to focus on using these technologies as reliability measurement tools.
- Team training/certification compliance.
- Identify and acquire real estate and easement rights as appropriate and necessary to support current and future requirements.

FIGURE 1-1

R 25 E | R 26 E | R 27 E

T 48 S | T 49 S | T 50 S | T 51 S | T 52 S

GULF OF MEXICO

NORTHEAST SERVICE AREA NO. 1

NORTHEAST SERVICE AREA NO. 2

ORANGETREE

ORANGETREE WRF

NCWRF

CITY OF NAPLES

NAPLES WRF

FGUA SERVICE AREA

GOLDEN GATE CITY WRF

EAST CENTRAL SERVICE AREA

COLLIER COUNTY WATER-SEWER DISTRICT

SCWRF

SOUTHEAST SERVICE AREA

COLLIER\ SEMINOLE STATE PARK

GOODLAND WATER SUB-DISTRICT

MARCO ISLAND WATER AND SEWER DISTRICT

0 0.5 1 2 3 4

SCALE IN MILES

LEGEND

- EXISTING CCWSD WRF
  - NORTH COUNTY
  - SOUTH COUNTY
- OTHER TREATMENT PLANTS
- CCWSD WASTEWATER SERVICE AREA
- CITY OF NAPLES
- FGUA SERVICE AREA
- ORANGETREE SERVICE AREA
- GOLDEN GATE ESTATES
- WATER-SEWER DISTRICT BOUNDARY
- BOUNDARY BETWEEN NORTH AND SOUTH SERVICE AREAS
- DISTRICT BOUNDARY PRIOR TO 2003

EXISTING AND FUTURE WASTEWATER SERVICE AREAS

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

GREELEY AND HANSEN

FIGURE 2-1

R 25 E | R 26 E | R 27 E

T 48 S | T 49 S | T 50 S | T 51 S | T 52 S

NORTHEAST SERVICE AREA NO. 1

NORTHEAST SERVICE AREA NO. 2

ORANGETREE

ORANGETREE WRF

NCWRF

FGUA SERVICE AREA

EAST CENTRAL SERVICE AREA

CITY OF NAPLES

GOLDEN GATE CITY WRF

NAPLES WRF

COLLIER COUNTY WATER-SEWER DISTRICT

SCWRF

SOUTHEAST SERVICE AREA

COLLIER SEMINOLE STATE PARK

GOODLAND WATER SUB-DISTRICT

MARCO ISLAND WATER AND SEWER DISTRICT

GULF OF MEXICO

0 0.5 1 2 3 4

SCALE IN MILES

LEGEND

- EXISTING CCWSD WRF
  - NORTH COUNTY
  - SOUTH COUNTY
- OTHER TREATMENT PLANTS
- AREA OF CURRENT WASTEWATER SERVICE
- CITY OF NAPLES
- FGUA SERVICE AREA
- ORANGETREE SERVICE AREA
- GOLDEN GATE ESTATES
- WATER-SEWER DISTRICT BOUNDARY
- BOUNDARY BETWEEN NORTH AND SOUTH SERVICE AREAS
- DISTRICT BOUNDARY PRIOR TO 2003

AREA OF CURRENT WASTEWATER SERVICE

GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

FIGURE 4-1

NORTH WASTEWATER SERVICE AREA

NORTHEAST SERVICE AREA NO. 1

NORTHEAST SERVICE AREA NO. 2

FUTURE UTILITY CORRIDOR

ORANGETREE

ORANGETREE WRF

NCWRF

VBR PS

FGUA SERVICE AREA

GOLDEN GATE CITY WRF

NAPLES WRF

EAST CENTRAL SERVICE AREA

FUTURE UTILITY CORRIDOR

2002 BOUNDARY

BONITA BEACH ROAD (C.R. 865)

NAPLES–IMMOKALEE ROAD (C.R. 846)

VANDERBILT BEACH RD. EXT.

GOLDEN GATE PKWY (C.R. 886)

ALLIGATOR ALLEY (S.R. 84)

INTERSTATE – 75

0 0.5 1 2 3 4

SCALE IN MILES

LEGEND

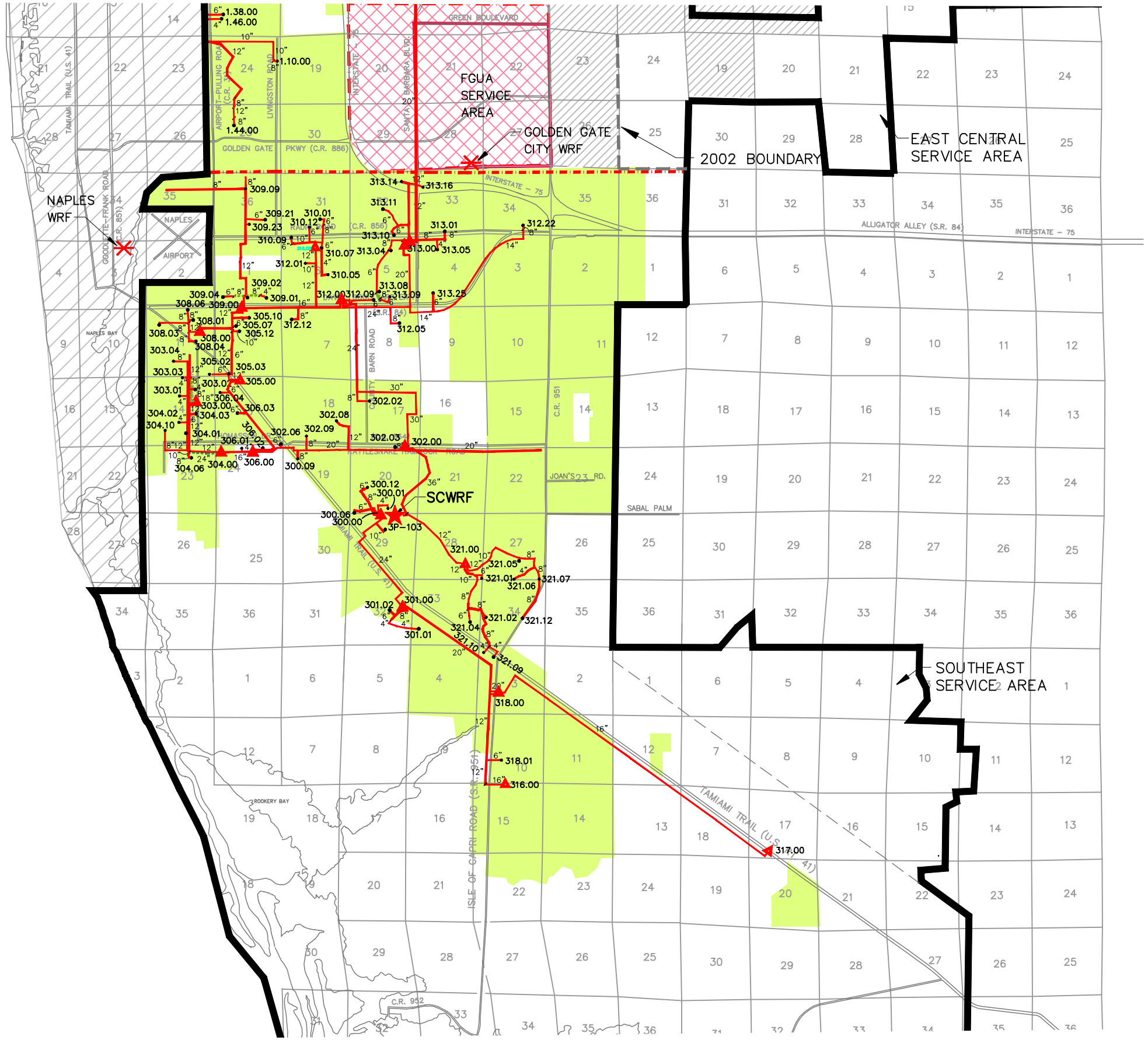
- CITY OF NAPLES SERVICE AREA
- FGUA SERVICE AREA
- WASTEWATER AREAS SERVED
- ORANGETREE AREA
- GOLDEN GATE ESTATES
- SUB–MASTER PUMP STATION
- MASTER PUMP STATION
- EXISTING CCWSD WRF
  - NORTH COUNTY
  - SOUTH COUNTY
- OTHER TREATMENT PLANTS
- FORCE MAIN
- WATER–SEWER DISTRICT BOUNDARY
- BOUNDARY BETWEEN NORTH AND SOUTH SERVICE AREAS
- DISTRICT BOUNDARY PRIOR TO 2003

GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

FILE: 2008 FIGURE 4-1_R 1:1 06/25/08 14:39 GH-E

FIGURE 4-2



0 0.5 1 2 3 4

SCALE IN MILES

LEGEND

- CITY OF NAPLES SERVICE AREA
- FGUA SERVICE AREA
- WASTEWATER AREAS SERVED
- GOLDEN GATE ESTATES
- SUB-MASTER PUMP STATION
- MASTER PUMP STATION
- EXISTING COUNTY WRF
  - NORTH COUNTY
  - SOUTH COUNTY
- OTHER TREATMENT PLANTS
- FORCE MAIN
- WATER-SEWER DISTRICT BOUNDARY
- BOUNDARY BETWEEN NORTH AND SOUTH SERVICE AREAS
- DISTRICT BOUNDARY PRIOR TO 2003

GREELEY AND HANSEN

SOUTH WASTEWATER SERVICE AREA

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

FILE: 2008 FIGURE 4-2_R 1:1 06/25/08 14:37 GH-E

FILE: 2008 FIGURE 4-3_R 1:1 05/27/08 09:17 GH-E

FIGURE 4-3

T 48 S

T 49 S

T 50 S

T 51 S

GULF OF MEXICO

LIVINGSTON ROAD WELLFIELD

IMMOKALEE ROAD WELLFIELD

NCWRF

SCWRF

EAGLE LAKE MITIGATION AREA

LEGEND

- WATER-SEWER DISTRICT BOUNDARY
- DISTRICT BOUNDARY PRIOR TO 2003
- EXISTING IRRIGATION CUSTOMER (1.06)
- WATER RECLAMATION FACILITY (NCRWRF)
- EXISTING IRRIGATION QUALITY WATER LINES

0 0.5 1 2 3 4

SCALE IN MILES

IRRIGATION QUALITY WATER SYSTEM

GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

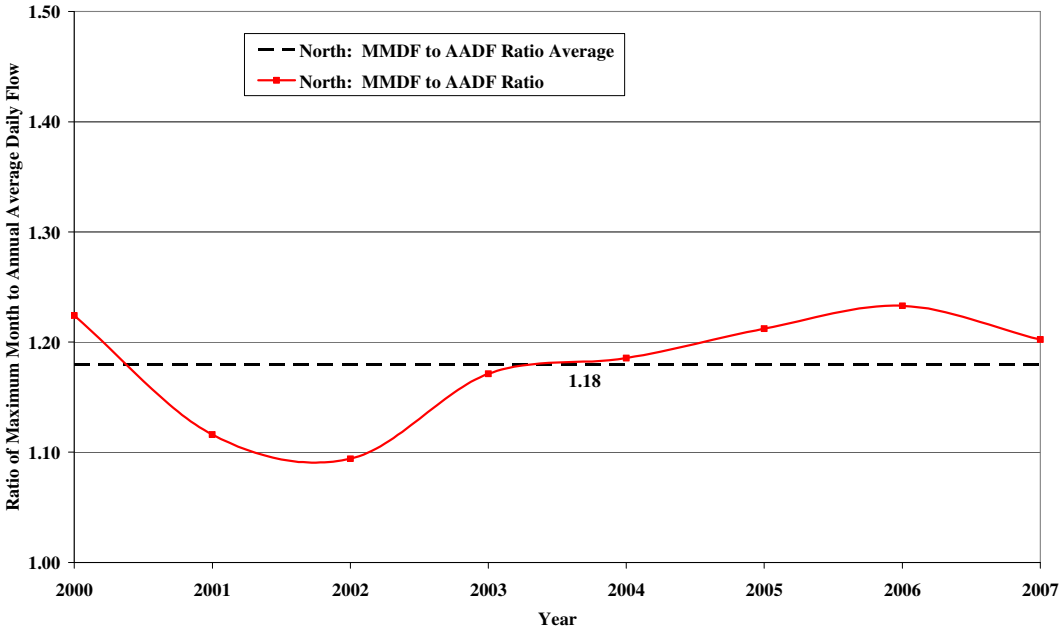
Figure 5-1

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE

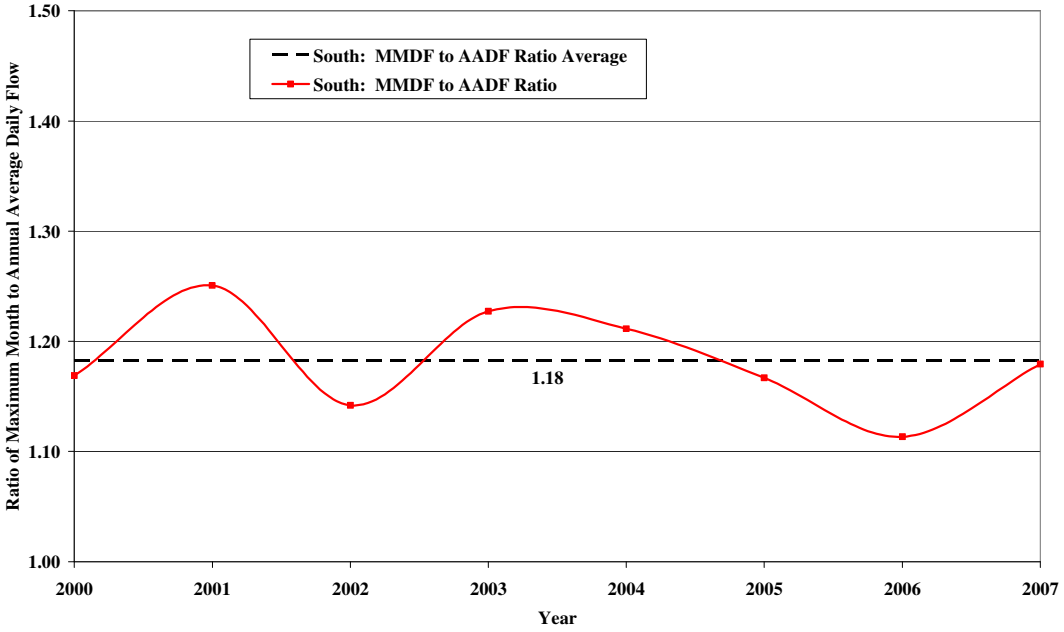
NCWRF and SCWRF Ratio of MMDF to AADF – 2000 – 2007

Greeley and Hansen
24 June 2008

NCWRF: Ratio of Maximum Month to Annual Average Daily Flow



SCWRF: Ratio of Maximum Month to Annual Average Daily Flow



FILE: 2008 FIG6-1-WW 1:1 05/29/08 09:54 GH-E

FIGURE 6-1

R 25 E R 26 E R 27 E

T 48 S T 49 S T 50 S T 51 S T 52 S

TO IMMOKALEE

N

NORTHEAST SERVICE AREA NO. 1

NORTHEAST SERVICE AREA NO. 2

PROPOSED NEW NERWRF SITE

ORANGETREE

EXISTING NCWRF

EAST CENTRAL SERVICE AREA

FGUA SERVICE AREA

CITY OF NAPLES

COLLIER COUNTY WATER-SEWER DISTRICT

EXISTING SCWRF

POTENTIAL NEW SERWRF SITE

SOUTHEAST SERVICE AREA

COLLIER\ SEMINOLE STATE PARK

GOODLAND WATER DISTRICT

MARCO ISLAND WATER AND SEWER DISTRICT

GULF OF MEXICO

BONITA BEACH ROAD (CR 865)

TAMIAMI TRAIL (US 41)

(CR 846) NAPLES-IMMOKALEE ROAD

VANDERBILT BEACH ROAD

PINE RIDGE ROAD (CR 896)

GOLDEN GATE PARKWAY (CR 886)

INTERSTATE - 75

RADIO ROAD (CR 856)

ALLIGATOR ALLEY (SR 84)

RATTLESNAKE HAMMOCK ROAD (CR 864)

THOMASSON DR.

BAYSHORE DR.

AIRPORT

SABAL PALM

COLLIER BLVD (CR 951)

SAN MARCO ROAD (CR 92)

BALD EAGLE DRIVE

WINTERBERRY DRIVE

0 0.5 1 2 3 4

SCALE IN MILES

LEGEND

- PROPOSED WATER TREATMENT PLANT
- CITY OF NAPLES
- FGUA SERVICE AREA
- ORANGETREE SERVICE AREA
- GOLDEN GATE ESTATES
- WATER-SEWER DISTRICT BOUNDARY

FIBER OPTIC NETWORK:

- EXISTING FIBER
- SPUR TO FACILITIES
- NEAR TERM PROPOSED FIBER
- PROPOSED FIBER

EXISTING AND FUTURE FIBER OPTIC COMMUNICATION SYSTEM

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

GREELEY AND HANSEN

FILE: 2008 FIGURE 7-1_R 1:1 05/29/08 10:48 GH-E

FIGURE 7-1

R 25 E | R 26 E | R 27 E

T 48 S | T 49 S | T 50 S | T 51 S | T 52 S

GULF OF MEXICO

NORTHEAST SERVICE AREA NO. 1

NORTHEAST SERVICE AREA NO. 2

PROPOSED NEWRF PLANT SITE

ORANGETREE

EXISTING NCWRF

NOT SERVED

EAST CENTRAL SERVICE AREA

FGUA SERVICE AREA

GOLDEN GATE CITY WRF

NAPLES WRF

SOUTH SERVICE AREA

EXISTING SCWRF

PROPOSED SEWRF PLANT SITE

SOUTHEAST SERVICE AREA

0 0.5 1 2 3 4

SCALE IN MILES

LEGEND

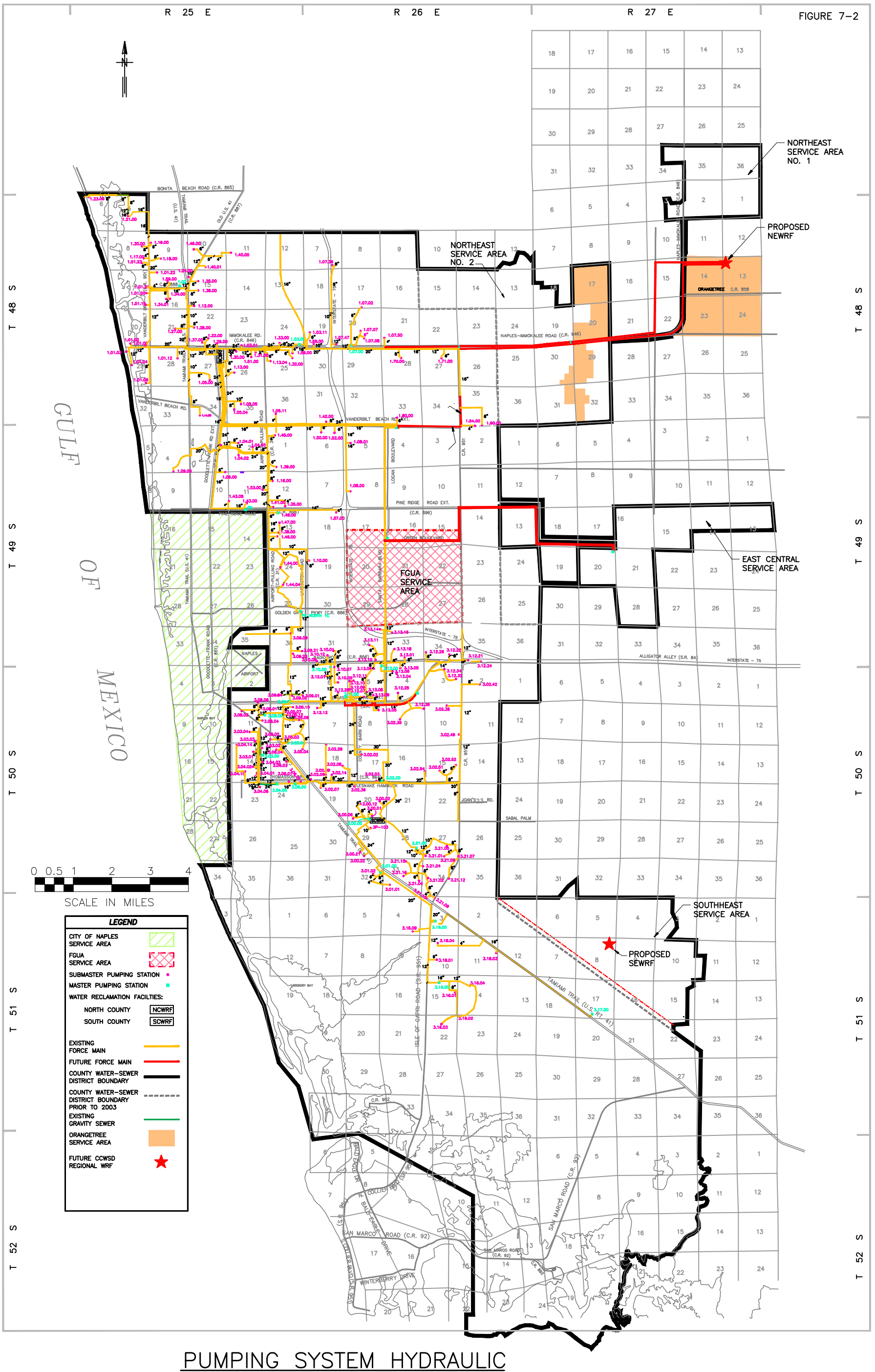
- CITY OF NAPLES SERVICE AREA
- FGUA SERVICE AREA
- WASTEWATER AREAS SERVED
- ORANGETREE AREA
- GOLDEN GATE ESTATES
- EXISTING AND FUTURE CCWSD REGIONAL WRF
- OTHER TREATMENT PLANTS
- GENERAL 2027 SERVICE BOUNDARY FOR EACH WRF
- POTENTIAL LOCATION NEW WRF

2027 WATER RECLAMATION FACILITY SERVICE AREAS

GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

FIGURE 7–2

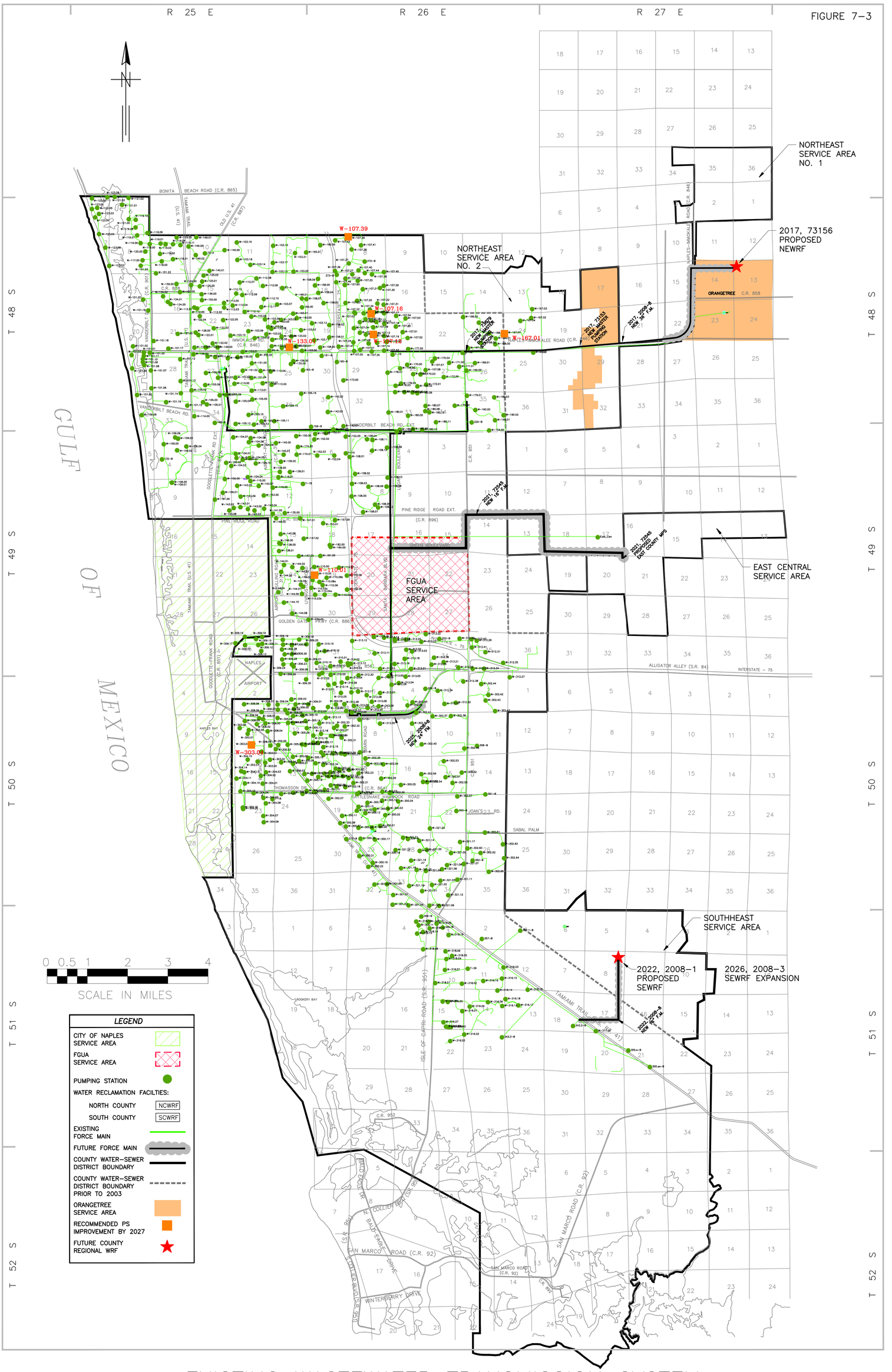


PUMPING SYSTEM HYDRAULIC MODEL CONFIGURATION

GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

FIGURE 7-3



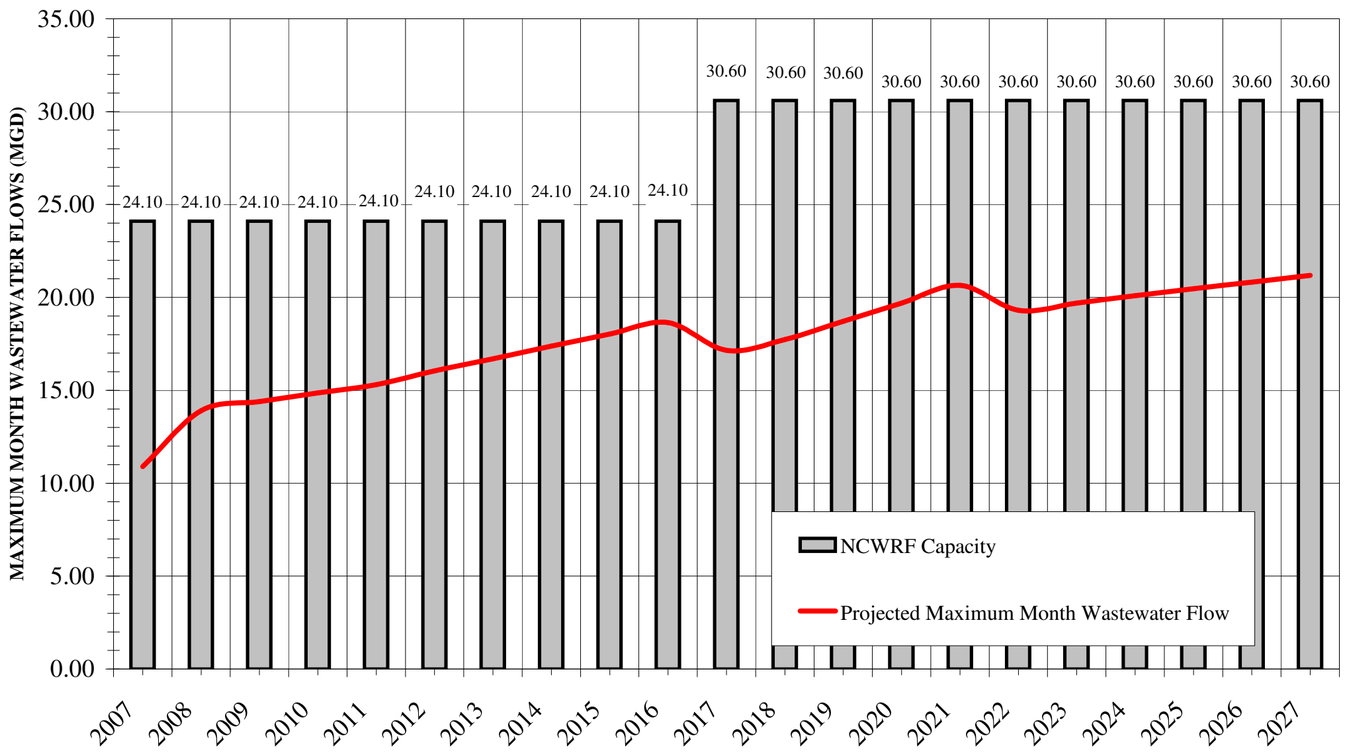
EXISTING WASTEWATER TRANSMISSION SYSTEM AND PROPOSED IMPROVEMENTS

GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

ESTIMATED NORTH COUNTY WRF
MAXIMUM MONTH WASTEWATER FLOWS

FIGURE 7-4

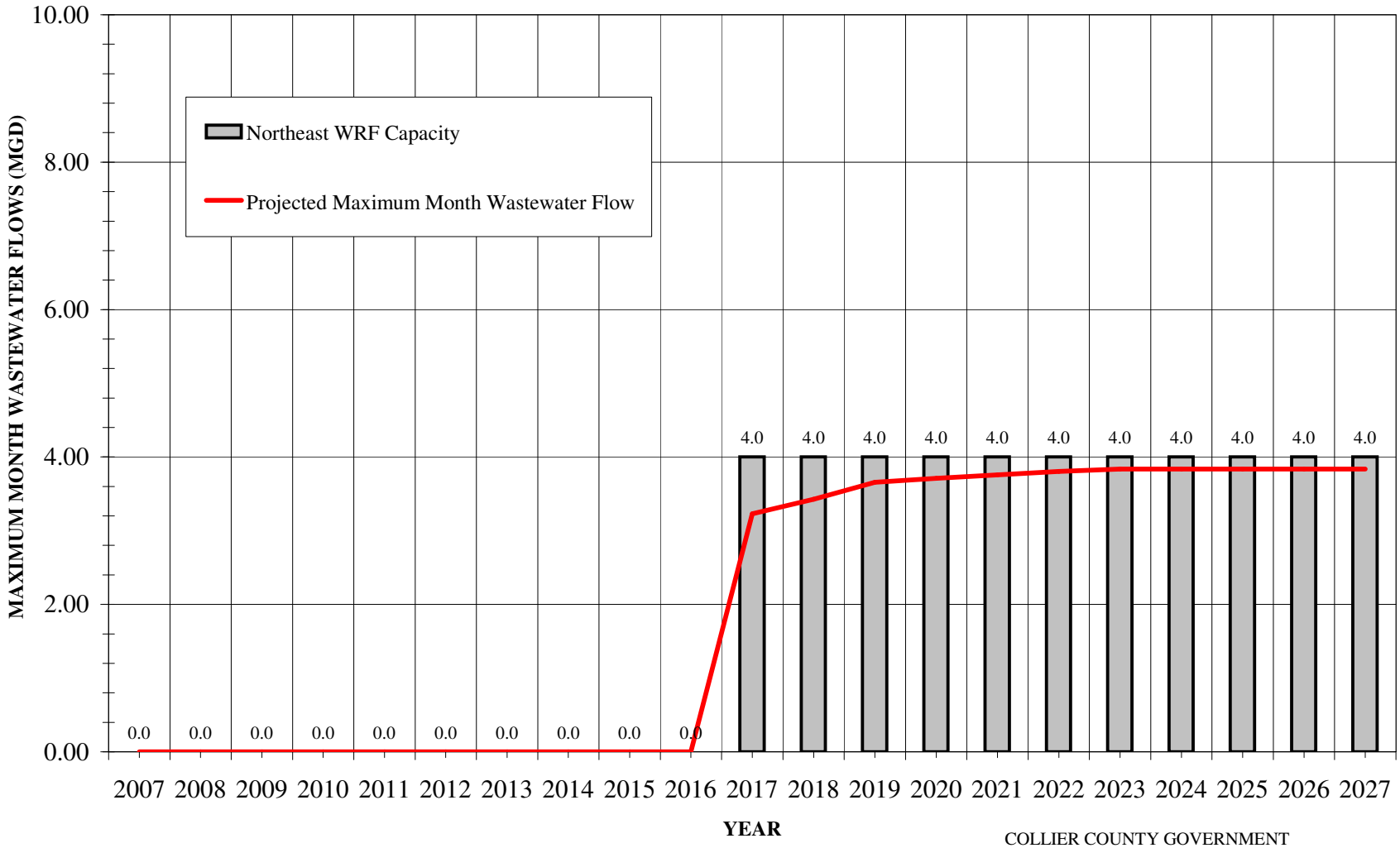


GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

ESTIMATED NORTHEAST WRF
MAXIMUM MONTH WASTEWATER FLOWS

FIGURE 7-5

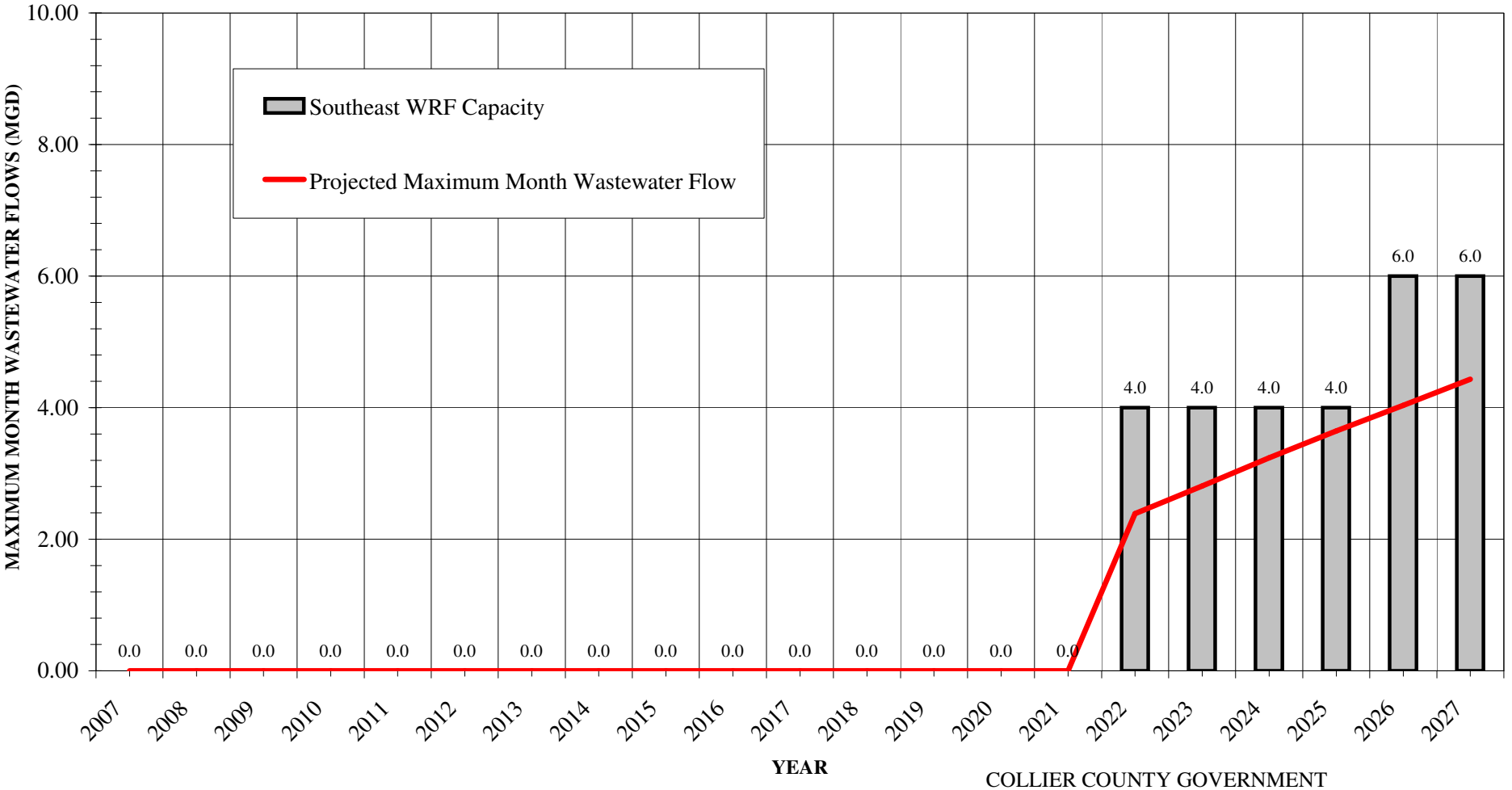


GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

ESTIMATED SOUTHEAST WRF
MAXIMUM MONTH WASTEWATER FLOWS

FIGURE 7-6

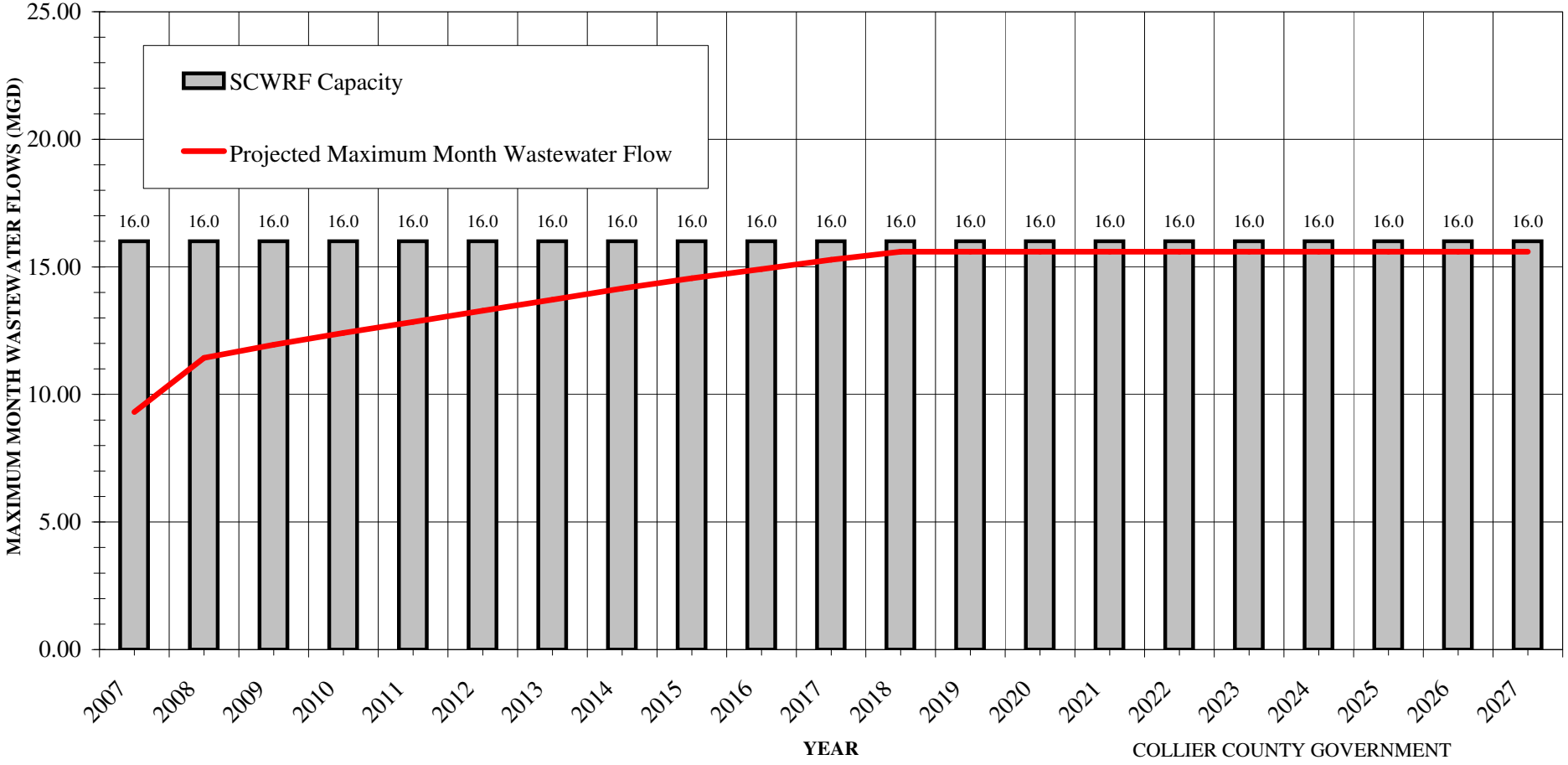


GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

ESTIMATED SOUTH COUNTY WRF
MAXIMUM MONTH WASTEWATER FLOWS

FIGURE 7-7



GREELEY AND HANSEN

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE
24 JUNE 2008

TABLE 5-1

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE

Wastewater Permanent Populations and Wastewater Flows for October 1 Each Year

Greeley and Hansen
24 June 2008

AREA	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
TOTAL COUNTYWIDE POPULATION (October 1)	317,868	329,944	342,479	354,138	364,846	375,877	387,242	398,951	409,917	420,092	430,520	441,206	452,157	462,270	471,502	480,918	490,521	500,317	509,645	518,483	527,474
TOTAL POPULATIONS BY AREA																					
Master Plan Growth Estimate																					
Sewered North	86,176	88,962	91,754	94,275	96,539	98,867	101,262	103,724	105,947	107,918	109,955	112,062	114,239	116,248	118,078	120,050	122,209	124,466	126,600	128,605	130,651
Sewered South	84,028	87,915	91,887	95,506	98,808	102,150	105,512	108,898	111,948	114,690	117,518	120,433	123,436	126,171	128,621	131,133	133,709	136,349	138,834	141,158	143,532
Orangetree	4,232	5,186	6,177	7,099	7,949	8,825	9,729	10,662	11,534	12,343	13,092	13,747	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600
Northeast 2	1,218	1,900	2,609	3,268	3,876	4,503	5,150	5,816	6,440	7,019	7,612	8,220	8,844	9,180	9,480	9,780	10,000	10,000	10,000	10,000	10,000
East Central	516	538	607	721	855	1,013	1,195	1,401	1,651	1,945	2,240	2,536	2,832	3,127	3,420	3,713	4,007	4,301	4,594	4,886	5,179
Southeast	293	295	366	506	669	900	1,224	1,640	2,148	2,702	3,255	3,809	4,363	4,917	5,470	6,024	6,578	7,131	7,685	8,238	8,792
Total Master Plan Growth Estimate	**176,463**	**184,796**	**193,401**	**201,374**	**208,696**	**216,260**	**224,072**	**232,142**	**239,669**	**246,616**	**253,672**	**260,806**	**268,315**	**274,242**	**279,669**	**285,300**	**291,102**	**296,847**	**302,313**	**307,487**	**312,754**
SEWERED POPULATIONS BY AREA	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Master Plan Growth Estimate																					
Sewered North	86,176	88,962	91,754	94,275	96,539	98,867	101,262	103,724	105,947	107,918	109,955	112,062	114,239	116,248	118,078	120,050	122,209	124,466	126,600	128,605	130,651
Sewered South	84,028	87,915	91,887	95,506	98,808	102,150	105,512	108,898	111,948	114,690	117,518	120,433	123,436	126,171	128,621	131,133	133,709	136,349	138,834	141,158	143,532
Orangetree	0	0	0	0	0	8,825	9,729	10,662	11,534	12,343	13,092	13,747	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600
Northeast 2	0	190	522	981	1,550	2,252	3,090	4,071	5,152	6,317	7,612	8,220	8,844	9,180	9,480	9,780	10,000	10,000	10,000	10,000	10,000
East Central	0	0	0	0	0	0	0	0	0	0	0	507	1,133	1,876	2,736	3,713	4,007	4,301	4,594	4,886	5,179
Southeast	0	0	0	0	0	0	0	0	0	0	0	762	1,745	2,950	4,376	6,024	6,578	7,131	7,685	8,238	8,792
Total	**170,204**	**177,067**	**184,163**	**190,761**	**196,898**	**212,094**	**219,593**	**227,356**	**234,582**	**241,267**	**248,177**	**255,730**	**263,997**	**271,025**	**277,891**	**285,300**	**291,102**	**296,847**	**302,313**	**307,487**	**312,754**
SEWERED WASTEWATER FLOW BY AREA	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
	Annual Average Daily Flows - mgd																				
Per Capita Wastewater Flow - North		120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Per Capita Wastewater Flow - South		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Per Capita Wastewater Flow - O, NE, EC and SE		120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Sewered North	8.38	10.68	11.01	11.31	11.58	11.86	12.15	12.45	12.71	12.95	13.19	13.45	13.71	13.95	14.17	14.41	14.67	14.94	15.19	15.43	15.68
Sewered South	7.16	8.79	9.19	9.55	9.88	10.22	10.55	10.89	11.19	11.47	11.75	12.04	12.34	12.62	12.86	13.11	13.37	13.63	13.88	14.12	14.35
Orangetree	0.00	0.00	0.00	0.00	0.00	1.06	1.17	1.28	1.38	1.48	1.57	1.65	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Northeast 2	0.00	0.02	0.06	0.12	0.19	0.27	0.37	0.49	0.62	0.76	0.91	0.99	1.06	1.10	1.14	1.17	1.20	1.20	1.20	1.20	1.20
East Central	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.14	0.23	0.33	0.45	0.48	0.52	0.55	0.59	0.62
Southeast	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.21	0.35	0.53	0.72	0.79	0.86	0.92	0.99	1.06
TOTAL	**15.54**	**19.49**	**20.26**	**20.98**	**21.65**	**23.41**	**24.24**	**25.10**	**25.91**	**26.66**	**27.43**	**28.28**	**29.21**	**30.00**	**30.77**	**31.61**	**32.26**	**32.89**	**33.50**	**34.08**	**34.66**
SEWERED WASTEWATER FLOW BY AREA	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
	Maximum Month Daily Flows - mgd																				
Sewered North	10.89	13.88	14.31	14.71	15.06	15.42	15.80	16.18	16.53	16.84	17.15	17.48	17.82	18.13	18.42	18.73	19.06	19.42	19.75	20.06	20.38
Sewered South	9.31	11.43	11.95	12.42	12.85	13.28	13.72	14.16	14.55	14.91	15.28	15.66	16.05	16.40	16.72	17.05	17.38	17.73	18.05	18.35	18.66
Orangetree	0.00	0.00	0.00	0.00	0.00	1.38	1.52	1.66	1.80	1.93	2.04	2.14	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28
Northeast 2	0.00	0.03	0.08	0.15	0.24	0.35	0.48	0.64	0.80	0.99	1.19	1.28	1.38	1.43	1.48	1.53	1.56	1.56	1.56	1.56	1.56
East Central	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.18	0.29	0.43	0.58	0.63	0.67	0.72	0.76	0.81
Southeast	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.27	0.46	0.68	0.94	1.03	1.11	1.20	1.29	1.37
TOTAL	**20.20**	**25.34**	**26.34**	**27.28**	**28.15**	**30.43**	**31.51**	**32.64**	**33.68**	**34.66**	**35.66**	**36.76**	**37.97**	**39.00**	**40.01**	**41.10**	**41.94**	**42.76**	**43.55**	**44.30**	**45.06**

TABLE 5-1

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE

Wastewater Permanent Populations and Wastewater Flows for October 1 Each Year

Greeley and Hansen
24 June 2008

SEWERED WASTEWATER FLOW BY WRF	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
	Maximum Month Daily Flows - mgd																				
NCWRF																					
Sewered North	10.89	13.88	14.31	14.71	15.06	15.42	15.80	16.18	16.53	16.84	17.15	17.48	17.82	18.13	18.42	18.73	19.06	19.42	19.75	20.06	20.38
Flow From Orangetree	0.00	0.00	0.00	0.00	0.00	0.28	0.42	0.56	0.70	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flow from Northeast 2 Area	0.00	0.03	0.08	0.15	0.24	0.35	0.48	0.64	0.80	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flow from East Central Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.18	0.29	0.43	0.58	0.63	0.67	0.72	0.76	0.81
Excess Flow from Sewered South and Southeast									0.00	0.00	0.00	0.18	0.72	1.26	1.80						
Total NCWRF	**10.89**	**13.91**	**14.40**	**14.86**	**15.30**	**16.05**	**16.70**	**17.38**	**18.03**	**18.65**	**17.15**	**17.74**	**18.72**	**19.69**	**20.65**	**19.31**	**19.69**	**20.09**	**20.47**	**20.82**	**21.19**
Capacity NCWRF	**24.10**	**24.10**	**24.10**	**24.10**	**24.10**	**24.10**	**24.10**	**24.10**	**24.10**	**24.10**	**30.60**	**30.60**	**30.60**	**30.60**	**30.60**	**30.60**	**30.60**	**30.60**	**30.60**	**30.60**	**30.60**
Orangetree WWTP																					
Orangetree						1.10	1.10	1.10	1.10	1.10											
Total Orangetree WWTP						**1.10**	**1.10**	**1.10**	**1.10**	**1.10**											
Capacity Orangetree WWTP						**1.10**	**1.10**	**1.10**	**1.10**	**1.10**											
Northeast WRF																					
Flow from Sewered North	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Orangetree	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04	2.14	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28
Northeast 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19	1.28	1.38	1.43	1.48	1.53	1.56	1.56	1.56	1.56	1.56
Total Northeast WRF	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.23**	**3.43**	**3.66**	**3.71**	**3.76**	**3.80**	**3.84**	**3.84**	**3.84**	**3.84**	**3.84**
Capacity NEWRF	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**
East Central MPS																					
East Central	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.18	0.29	0.43	0.58	0.63	0.67	0.72	0.76	0.81
Total East Central MPS	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.08**	**0.18**	**0.29**	**0.43**	**0.58**	**0.63**	**0.67**	**0.72**	**0.76**	**0.81**
Capacity ECMPS	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Southeast WRF																					
Excess Flow from Sewered South	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45	1.78	2.13	2.45	2.75	3.06
Southeast	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	1.03	1.11	1.20	1.29	1.37
Total Southeast WRF	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**2.39**	**2.81**	**3.24**	**3.65**	**4.04**	**4.43**
Capacity SEWRF	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**4.00**	**4.00**	**4.00**	**4.00**	**6.00**	**6.00**
SCWRF																					
Sewered South	9.31	11.43	11.95	12.42	12.85	13.28	13.72	14.16	14.55	14.91	15.28	15.66	16.05	16.40	16.72	17.05	17.38	17.73	18.05	18.35	18.66
Southeast	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excess Flow to NCWRF												0.06	0.45	0.80	1.12						
Excess Flow to Southeast																1.45	1.78	2.13	2.45	2.75	3.06
Total SCWRF	**9.31**	**11.43**	**11.95**	**12.42**	**12.85**	**13.28**	**13.72**	**14.16**	**14.55**	**14.91**	**15.28**	**15.60**	**15.60**	**15.60**	**15.60**	**15.60**	**15.60**	**15.60**	**15.60**	**15.60**	**15.60**
Capacity SCWRF	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**	**16.00**
Total Capacity - All Plants	**40.10**	**40.10**	**40.10**	**40.10**	**40.10**	**41.20**	**41.20**	**41.20**	**41.20**	**41.20**	**50.60**	**50.60**	**50.60**	**50.60**	**50.60**	**54.60**	**54.60**	**54.60**	**54.60**	**56.60**	**56.60**

TABLE 5-2

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE

Historical Wastewater Flow Data - NCWRF and SCWRF

Greeley and Hansen
24 June 2008

The adopted Level of Service Standard (LOSS) for per capita wastewater flow is 145 gallons per capita per day (gpcd) annual average daily flow (AADF) for the North Wastewater Service Area and 100 gpcd AADF for the South Wastewater Service Area. Historical per capita water demand is shown in the following charts.

NCWRF Historical Wastewater Flow
Adopted LOSS = 145 gpcd

Year	Permanent Population in the North Service Area	Annual Average Daily Wastewater Flow at the NCWRF (MGD)	Per Capita AADF (gpcd)
2000	61,030	8.43	138
2001	66,529	8.33	125
2002	72,689	8.41	116
2003	78,599	8.88	113
2004	83,753	8.89	106
2005	87,660	9.41	107
2006	90,659	9.65	106
2007	86,176	8.38	97
Average			112

The average daily wastewater flow for the last eight years (2000-2007) is 112 gpcd. The most recent three-year average is 104 gpcd. The most recent five-year average is 106 gpcd. The range of values over the last five years is 97 gpcd to 113 gpcd.

SCWRF Historical Wastewater Flow
Adopted LOSS = 100 gpcd

Year	Permanent Population in the South Service Area	Annual Average Daily Wastewater Flow at the SCWRF (MGD)	Per Capita AADF (gpcd)
2000	69,276	6.43	93
2001	72,223	7.00	97
2002	75,049	7.35	98
2003	78,107	6.87	88
2004	81,190	6.90	85
2005	84,095	7.57	90
2006	87,320	7.43	85
2007	84,028	7.16	85
Average			90

The average daily wastewater flow for the last eight years (2000-2007) is 90 gpcd. The most recent three-year average is 87 gpcd. The most recent five-year average is 87 gpcd. The range of values over the last five years is 85 gpcd to 90 gpcd.

TABLE 7-1

COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE

Recommended Improvements by Year 2027

Greeley and Hansen
24 June 2008

Wastewater Treatment Improvements			
Fiscal Year Placed in Service	**Project No.**	**Project Name**	**Project Description**
2017	**73156**	**Northeast Water Reclamation Facility**	**Design and construction of proposed 4.0 MGD MMDF NEWRF scheduled for 2017 to serve new customers in the Northeast Service Area.**
2022	**2008-1**	**Southeast Water Reclamation Facility**	**Design and construction of a new 4.0 MGD MMADF WRF by 2022 to serve new customers in the Southeast Service Area.**
2026	**2008-3**	**Southeast Water Reclamation Facility 2.0 MGD Expansion**	**Design and construction of 2.0 MGD expansion of SEWRF scheduled for 2026.**

Wastewater Transmission Projects			
Fiscal Year Placed in Service	**Project No.**	**Project Name**	**Project Description**
2017, 2022	**2008-8**	**Transmission Pipelines to Rural Fringe Receiving Areas**	**Transmission pipelines to new water reclamation facilities to serve the Rural Fringe Areas.**
2017	**73079**	**Master Pumping Station-Immokalee Road/ CR 951**	**Design and construction of new Master Pumping Station at Immokalee Road/951**
2017	**73153**	**MPS-Immokalee Road East Area "B"**	**Design and construction of MPS to Serve Northeast Service Area.**
2019	**2008-6**	**Davis Boulevard 24" Force Main from MPS 312.00 to MPS 3.14**	**Study, design and construction of new 24" force main along Davis Boulevard from new MPS 3.14 to existing MPS 3.12**
2021	**72545**	**East Central Force Main, Master Pumping Station and Pretreatment Facility**	**Study, design and construction of a new force main and pumping station to interconnect proposed East Central MPS to existing system.**

Pumping Station Improvements			
Fiscal Year Placed in Service		**Pumping Station**	
2017		**Pumping stations recommended for improvement are shown in Appendix D.**	
2027		**Pumping stations recommended for improvement are shown in Appendix E.**	

TABLE 8-1
COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS
WASTEWATER AND IRRIGATION QUALITY WATER
PROJECT DESCRIPTIONS

Greeley and Hansen
24-Jun-08

	Fund/Type (A)	Project No.	WBS No.	Project Manager	Source	Project Type	Project Name	Description
							WASTEWATER PROJECTS	
							Existing Wastewater 413 (Growth Related) Projects	
1	413/GD	70202	702025	NB	B	General	County Utility Standards	Update County Utility Standards.
2	413/GD	70413	704131	BS	M	General	Refund of Impact Fee	Refund of Impact Fee.
3	413/GD	72001	720011	AA	B	Land Acquisition	Southeast WRF Land Acquisition	Purchase 150-acre site in Southeast Rural Fringe area for site of WRF.
4	413/GD	72004	720041	RD	B	Transmission	VBR Force Main - Logan Blvd. To Airport Rd.	Study, design and construction of a new 24-inch force main along Vanderbilt Beach Road from Logan Blvd. To Airport Road.
5	413/GD	72005	720051	WM	B	Land Acquisition	East Central Master Pumping Station Land Acquisition	Purchase site in East Central Service Area for site of Master Pumping Station.
6	413/GD	72006	720061	WM	M	Close Out - Land Acquisition	Land Acquisition Study for East Central Master Pumping Station	Close out project to study possible sites for location of up to 1.0 MGD MMADF Master Pumping Station in East Central Service Area.
7	413/GD	72008	720081	DA	B	Close Out - Plants	SCWRF Safety Upgrades to Chemical Facilities	Study, design and construction to provide safety adjustments and upgrades to chemical facilities at the SCWRF.
8	413/GD	72545	725451	WM	MP	Lift Station New	East Central Force Main, Master Pumping Station and Pretreatment Facility	Study, design and construction of a new force main and pumping station to interconnect proposed East Central MPS to existing system.
9	413/GD	72546	725461	SS	M	Close Out - Lift Station Rehab	Pump Station Improvements	Close out project for various pumping station improvements.
10	413/GD	73066	730663	PG	B	Study	Wastewater Master Plan Updates	Wastewater MP Updates every three years. Includes costs for annual Master Plan Supplements.
11	413/GD	73079	730791	SS	B	Lift Station New	Master Pumping Station-Immokalee Road/ CR 951	Design and construction of new Master Pumping Station at Immokalee Road/951
12	413/GD	73088	730881	PG	B	Study	Biosolids Master Plan	Prepare biosolids master plan.
13	413/GD	73131	731311	RD	B	Close Out - Transmission	Immokalee Road East 16" Force Main - Phases 1 and 2	Close out project for design and construction of a 16-inch force main east along Immokalee Road from 951 to proposed NEWRF. This force main to be constructed with Immokalee Road widening.
14	413/GD	73153	731531	SS	B	Lift Station New	MPS-Immokalee Road East Area "B"	Design and construction of MPS to Serve Northeast Service Area.
15	413/GD	73155	731551	AA	B	Land Acquisition	NEWRF - Acquire Site	Rezoning for NEWRF site.
16	415	73156	731562	AA	MP	Plants	Northeast Water Reclamation Facility	Design and construction of proposed 4 MGD NEWRF scheduled for 2017.
17	413/GD	73157	731571	AA	B	Close Out - Land Acquisition	SEWRF-Land Acquisition Study	Close out project for study of possible sites for location of WRF in Southeast Service Area.
18	413/GD	73195	731951	SS	M	Lift Station Rehab	MPS 3.14 (Naples Heritage)	Study, design and construction of Master Pump Station 314.
19	413/GD	73945	739451	SS	MP	Close Out - Lift Station Rehab	Future Pump Station Improvements	Close out project for future pumping station improvements.
20	413/GD	73945	739454	SS	B	Close Out - Lift Station Rehab	Pump Station Improvements	Close out project for improvements to pumping station capacities for growth.

TABLE 8-1
COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS
WASTEWATER AND IRRIGATION QUALITY WATER
PROJECT DESCRIPTIONS

Greeley and Hansen
24-Jun-08

	Fund/Type (A)	Project No.	WBS No.	Project Manager	Source	Project Type	Project Name	Description
21	413/GD	73946	739461	RD	B	Close Out - Transmission	CR 951 Force Main Upsizing	Close out project for CR 951- Upsizing Agreement for installation of force main from Sabal Palm Road to Rattlesnake Hammock Road
22	413/GD	73948	739481	PG	B	Close Out - Plants	NCWRF Deep Injection Wells and Pumping Station	Close out project for design and installation of two deep injection wells and new DIW pumping station.
23	413/GD	73950	739502	PS	B	Plants	NCWRF Expansion to 24.1 mgd MMADF- Solids Stream	Partial funding for the design and permitting of the NCWRF Expansion to 30.6 MGD MMADF project.
24	413/GD	73950	739503	PS	B	Plants	NCWRF Expansion to 30.6 MGD	Design, permitting and construction of expansion of NCWRF to 30.6 MGD MMADF.
25	413/GD	73950	739505	PS	B	Plants	NCWRF Compliance Assurance Project	Construction of necessary additional components and upgrades to assure NCWRF regulatory compliance.
	413/GD	73950	739507	PS	B	Plants	NCWRF Bridge the Gap	Design and construction of NCWRF "Bridge the Gap" project.
26	413/GD	73976	739761	DD	B	Plants	Upgrades for Fully Compliant IQ Water	Design and construction of necessary components to upgrade the NCWRF to provide fully compliant IQ water..
27	413/GD	74310	743101	TW	B	General	State Revolving Fund Procurement	This project is to procure State Revolving Fund (SRF) loans.
28	413/GD	75008	750081	PS	B	Study	NCWRF Capacity Analysis and Process Enhancement	Capacity Analysis and Process enhancement study for the NCWRF.
29	413/GD	75009	750094	NB	MP	General	SFWMD Grant Applications - Wastewater	Preparation of SFWMD Grant applications.
30	413/GD	75010	750102	PG	M	Study	Evaluation of Orangetree Utility System	Study for evaluation of existing Orangetree wastewater system
31	413/GD	75012	750122	AA	M	Plants	Project Management/ Oversight for NE Utility Facility	Project management and oversight for construction of Northeast wastewater facility.
32	413/GD	75014	750142	PG	M	Study	Growth Management Plan Update (Update every 7 years from 2007)	Prepare updates for for Growth Management Plan.
33	413/GD	75016	750162	PG	M	Close Out - Study	Evaluation of Per Capita Level of Service	Close out for study to evaluate per capita level of service.
34	413/GD	75017	750172	PG	M	Study	PUD Hydraulic Analysis	Review of wastewater capacity for new development requests.
35	413/GD	75018	750183	TW	M	General	Financial Services 413 (Orangetree evaluation by PRMG)	Study for financial evaluation of Orangetree.
36	413/GD	75019	750193	PG	M	Study	AUIR Update 413	Prepare Annual Update and Inventory Report (Fund 413 portion).
37	413/GD	75020	750202	PG	M	Study	LDC Review and Amendment	Review and update Land Development Code.
38							**New Wastewater 413 Projects**	
39	413/GD	2008-1	TBD	AA	MP	Plants	SEWRF - New 4.0 mgd (Note: Funding begins in 2015)	Design and construction of a new 4.0 MGD MMADF WRF by 2022 to serve new customers in the southeast Rural Fringe area. Costs include deep injection wells.
40	413/GD	2008-2	TBD	AA	MP	Plants	SEWRF Off Site Pipelines and Interconnection (Note: Funding begins in 2019)	Design and construction of new pipelines to connect to the Southeast WRF.
41	413/GD	2008-3	TBD	TBD	MP	Plants	SEWRF- 2.0 mgd Expansion (See Note 4)	Design and construction of 2.0 MGD expansion of SEWRF scheduled for 2026.
42	413/GD	2008-5	TBD	PS	MP	Plants	SCWRF Capacity Analysis and Process Enhancement	Analysis and design of various SCWRF capacity and process enhancements.
43	413/GD	2008-6	TBD	RD	MP	Transmission	Davis Boulevard 24" Force Main from MPS 312.00 to MPS 3.14	Study, design and construction of new 24" force main along Davis Boulevard from new MPS 3.14 to existing MPS 3.12

TABLE 8-1
COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS
WASTEWATER AND IRRIGATION QUALITY WATER
PROJECT DESCRIPTIONS

Greeley and Hansen
24-Jun-08

	Fund/Type (A)	Project No.	WBS No.	Project Manager	Source	Project Type	Project Name	Description
44	413/GD	2008-8	TBD	PG	MP	Transmission	Transmission Pipelines to Rural Fringe Receiving Areas	Transmission pipelines to new water reclamation facilities to serve the Rural Fringe Areas.
45	413/GD	2008-9	TBD	SL	MP	Lift Station New	New Master Pumping Stations for Rural Fringe Receiving Areas	New Master Pumping Stations in the Rural Fringe Receiving Areas.
46	413/GD	2008-10	TBD	AA	MP	Lift Station New	Orangetree Capacity Improvements	Study, design and construction of new pumping station and force main from Orangetree WWTP to proposed NEWRF.
47	413/GD	2008-14	TBD	AA	MP	Plants	SCWRF Capacity Improvements	Design and construction of SCWRF capacity improvements.
48	413/GD	2008-24	TBD	SS	M	Lift Station Rehab	MPS Mechanical improvements - Impact	Future growth-related upgrades to pump stations.
49							**Existing Wastewater 414 (Renewal/Replacement) Projects**	
50	414/R,R&E	70078	700782	JY	B	General	Special Assessment Software	Purchase and implement software for record keeping related to Special Assessment utility projects.
51	414/R,R&E	70202	702022	NB	B	General	County Utility Standards	Update County Utility Standards.
52	414/R,R&E	72008	720082	DA	B	Close Out - Plants	SCWRF Safety Upgrades to Chemical Facilities	Study, design and construction to provide safety adjustments and upgrades to chemical facilities at the SCWRF.
53	414/R,R&E	72500	725001	JS	B	Collection	South County I&I Implementation	Construct improvements to reduce wet weather flows to the SCWRF.
54	414/R,R&E	72503	725031	TT	B	Collection	Sewer System Mapping	Data collection and equipment for sewer system mapping.
55	414/R,R&E	72504	725042	TC	M	Close Out - Transmission	2005 MPS Facility Renewal	Close out project for construction of improvements at master pumping stations, including new transfer switches at 13 pumping stations, replace drives, and replace roof at MPS 3.02. FY 06-08: Miscellaneous MPS Renewals.
56	414/R,R&E	72504	725043	TC		Transmission	MPS and Sub-MPS Electrical and Instrumentation/Control Renewal	Construct electrical and instrumentation improvements at master and sub-master pumping stations.
57	414/R,R&E	72505	725051	JP	B	Close Out - Security	Security Upgrades	Study and implementation of security enhancements at major wastewater facilities.
58	414/R,R&E	72505	725052	Jp	B	Security	Future Security Upgrades	Study and implementation of future security enhancements at major wastewater facilities.
59	414/R,R&E	72506	725061	TC	B	Close Out - Plants	NCWRF Renew Sludge Pump Rooms	Close out project for replacement of sludge pumps, motors and related valves and piping (WAS and RAS pumps). Pressure wash and repaint entire pump room for sludge pump stations 1, 2 and3.
60	414/R,R&E	72508	725081	OM	B	Close Out - Plants	SCWRF Reliability Improvements	Close out project to rehab clarifiers 1 and 2, ammonia process analyzers and reroute raw influent yard piping from Lely High School.
61	414/R,R&E	72508	725082	OM	B	Close Out - Plants	2005 SCWRF Reliability Improvements	Close out project for SCWRF reliability improvements.
62	414/R,R&E	72509	725091	DA	B	Close Out - Plants	SCWRF Process Control Bldg Expansion	Close out project for additional office, training and work space to meet additional staffing requirements at the NCWRF.
63	414/R,R&E	72510	725101	DA	B	Close Out - Plants	NCWRF Process Control Bldg Expansion	Close out project for additional office, training and work space to meet additional staffing requirements for the expanded facility at the SCWRF.
64	414/R,R&E	72512	725121	TC	M	Close Out - Plants	NCWRF Reliability Improvements	Close out project for NCWRF reliability improvements.
65	414/R,R&E	72514	725141	CN	B	Close Out - SCADA	SCWRF SCADA Architecture Reliability Improvements	Close out project to install additional fiber cables and PLC modules to provide backup communication path in the event of a communication failure.

TABLE 8-1
COLLIER COUNTY GOVERNMENT
PUBLIC UTILITIES DIVISION
2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS
WASTEWATER AND IRRIGATION QUALITY WATER
PROJECT DESCRIPTIONS

Greeley and Hansen
24-Jun-08

	Fund/Type (A)	Project No.	WBS No.	Project Manager	Source	Project Type	Project Name	Description
66	414/R,R&E	72517	725171	DE	B	Close Out - Study	CMOM and Staff Optimization	Close out project for study and implementation to comply with CMOM requirements.
67	414/R,R&E	72523	725231	DD	B	Close Out - Collection	Collections Building Renovation	Close out project for office space renovation for Collections Building on Shirley Street.
68	414/R,R&E	72528	725281	RD	B	Transmission	Replace Hitching Post Force Main	Design and construction to replace existing force main in Trail Acres.
69	414/R,R&E	72532	725321	TC	B	Close Out - Plants	2005 NCWRF Rehabilitation	Close out project for construction of NCWRF rehabilitation projects.
70	414/R,R&E	72532	725341	OM	B	Close Out - Plants	2005 NCWRF Rehabilitation	Close out project for facility rehabilitation, renewal and replacement.
71	414/R,R&E	72540	725401	CN	B	Close Out - Plants	Electronic O & M Manuals	Close out project to create electronic Operations and Maintenance Manuals for the NCWRF and SCWRF.
72	414/R,R&E	72541	725411	OM	B	SCADA	Wastewater SCADA Software and Support Renewals	Wastewater SCADA Software and Support.
73	414/R,R&E	72542	725421	JS	B	Collection	North County I&I Implementation	Construct improvements to reduce wet weather flows to the NCWRF.
74	414/R,R&E	73045	730451	RD	B	Transmission	FDOT Joint Project Agreements - Sewer	Contingency fund for the relocation of sewer mains for various FDOT projects at various locations.
75	414/R,R&E	73050	730501	JS	B	Collection	Sewer Line Rehabilitation	Rehabilitate existing sewers using trenchless technology to reduce maintenance costs and control inflow and infiltration.
76	414/R,R&E	73051	730511	JS	M	Close Out - Lift Station New	Pumping ABD Lift Station	Close out project for lift station improvements.
77	414/R,R&E	73051	730513	JS	M	Close Out - Lift Station Rehab	2006 Pump/Lift Station Rehab	Close out project for lift staion rehabilitation.
78	414/R,R&E	73064	730641	TC	M	Close Out - Transmission	Odor/Corrosion Control	Close out project to investigate and implement odor and corrosion control improvements throughout the wastewater collection system.
79	414/R,R&E	73064	730642	TC	M	Close Out - Transmission	Odor/Corrosion Control	Close out project to construct odor control facilities.
80	414/R,R&E	73065	730651	RD	B	Transmission	CCDOT Utility Relocates	Relocation of utilities as may be needed for County road construction for projects which began before 10-1-03. Project costs to be included in Transportation CIP for projects which began after 10-1-03.
81	414/R,R&E	73071	730712	KG	B	Plants	Energy Efficiency Enhancements	Study and implement electrical upgrades to improve energy efficiency at the treatment plants and master pumping stations.
82	414/R,R&E	73072	730721	CN	B	Close Out - General	Public Utilities Operations Center	Close out project to relocate sewer collection crews and equipment depot to a larger facility to accommodate growth.
83	414/R,R&E	73082	730821	SS		Close Out - Lift Station Rehab	Pump/Lift Station Replacement	Close out project for pump/lift staion replacement.
84	414/R,R&E	73084	730841	SS	M	Close Out - Lift Station Rehab	Improve Access to Pumping Stations	Close out project for design and construction to improve access to three pumping stations, including 3.12, 3.17 and St. Peter's Church.
85	414/R,R&E	73165	731651	PG	B	Study	Asset Management Assistance	Prepare and implement asset management plan.
86	414/R,R&E	73301	733011	RD	M	Close Out - Transmission	Relocate Underground Utilities VBR-Airport to CR-951	Close out project to relocate wastewater pipelines along Vanderbilt Road from Airport to CR 951.
87	414/R,R&E	73306	733061	RD	M	Close Out - Transmission	Rattlesnake Hammock Road to CR-951 - Relocate	Close out project for relocation of Rattlesnake Hammock Road to CR-951 transmission main.

TABLE 8-1
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CAPITAL IMPROVEMENT PROJECTS
WASTEWATER AND IRRIGATION QUALITY WATER
PROJECT DESCRIPTIONS

Greeley and Hansen
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	Fund/Type (A)	Project No.	WBS No.	Project Manager	Source	Project Type	Project Name	Description
88	414/R,R&E	73922	739221	OM	B	SCADA	Wastewater Collection System SCADA/Telemetry	Add telemetry to all wastewater pumping stations.
89	414/R,R&E	73943	739431	RD	B	Close Out - Transmission	Immokalee 30" FM Pigging Station	Design and construction of pigging station to clean existing 30" force main.
90	414/R,R&E	73944	739441	JY	B	General	Billing System	Updating of the Billing System software currently utilized by the Department of Revenue for Water and Wastewater Accounts.
91	414/R,R&E	73950	739504	PS	B	Plants	NCWRF Expansion to 30.6 MGD	Design and construction of expansion of the NCWRF from 24.1 to 30.6 MGD MMADF.
92	414/R,R&E	73950	739506	PS	B	Plants	NCWRF Compliance Assurance Project	Funding for NCWRF Compliance Assurance Project.
	414/R,R&E	73950	739508	PS	B	Plants	NCWRF Bridge the Gap	Design and construction of NCWRF "Bridge-the-Gap" project.
93	414/R,R&E	73957	739571	DA	M	Close Out - Plants	NCWRF Bleach Piping	Close out project for the NCWRF bleach piping improvemets.
94	414/R,R&E	73958	739581	SF	M	Close Out - Lift Station Rehab	Purchase Generators for LS Reliability	Close out project to provide generators for lift station outages to maintain collection system reliability and prevent sanitary sewer overflows.
95	414/R,R&E	73960	739601	MK	B	Collection	Household Fats, Oils and Grease Campaign	The household Fats, Oils and Grease (F.O.G.) program will provide information on the proper disposal of cooking grease. The campaign includes pamphlet distribution, media advertisements, press releases, and individual and group meetings with neighborhood associations, civic groups and social groups.
96	414/R,R&E	73961	739611	MG	B	Close Out - Plants	Electronic Discharge Monitoring Report	Close out project to purchase software that will interface with the Florida Department of Environmental Protection's electronic Discharge Monitoring Report (DMR) and increase automation of data gathered in the compilation of the DMR reports.
97	414/R,R&E	73963	739631	DA	B	Close Out - Plants	Renovate SCWRF Wastewater Lab	Close out project for renovation and expansion of the SCWRF Administration Building to provide additional space for the Wastewater Laboratory, offices and storage.
98	414/R,R&E	73964	739641	OM	B	SCADA	Wastewater Facilities SCADA Network Improvements for Plants	WW SCADA Network Improvements, to include SCADA Backbones at each Plant plus other major facilities. Enhance Reporting, Data Acquisition, and System-wide Business Process & Metrics Tools.
99	414/R,R&E	73966	739661	DD	B	Plants	NCWRF Bleach System	Project for replacement/rehabilitation of the NCWRF Bleaching System.
100	414/R,R&E	73966	739662	DD	M	Plants	NCWRF Bleach System	Project for replacement/rehabilitation of the NCWRF Bleaching System.
101	414/R,R&E	73968	739681	TC	B	Plants	NCWRF Technical Support Projects	Design and construction of various NCWRF technical support projects.
102	414/R,R&E	73969	739691	DD	B	Plants	SCWRF Technical Support Projects	Design and construction of various SCWRF technical support projects.
103	414/R,R&E	73970	739701	SS	B	Close Out - Lift Station Rehab	Pump Station Improvements	Close out project for pumping station rehabilitation.
104	414/R,R&E	72972	739721	JS	B	Neighborhood Enhancement Program	Wyndemere Collection System Rehabilitation	Design and construction for replacement of Wyndemere wastewater collection system.
105	414/R,R&E	73973	739731	KG	M	Close Out - Plants	NCWRF R&R (414)	Close out project for NCWRF rehabilitation projects.
106	414/R,R&E	73974	739741	TC	M	Close Out - Collection	Collections R&R	Close out project for collection system rehabilitation projects.
107	414/R,R&E	73975	739751	TC	M	Close Out - Plants	NCWRF Odor Control	Close out project for NCWRF odor control facilities.
108	414/R,R&E	74050	740501	OM	B	Close Out - General	Eagle Lakes Nature Interpretive Center	Close out project for interpretive center maintenance.

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	Fund/Type (A)	Project No.	WBS No.	Project Manager	Source	Project Type	Project Name	Description
109	414/R,R&E	75007	750072	PG	B	Study	Wastewater Master Plan Updates	Prepation of Wastewater Master Plan Updates.
110	414/R,R&E	75008	750082	PS	B	Close Out - Plants	NCWRF Capacity Analysis and Process Enhancement	Close out project for Capacity Analysis and Process enhancement study for the NCWRF.
111	414/R,R&E	75009	750092	NB	B	General	SFWMD Grant Applications - Wastewater	Preparation of SFWMD Grant applications.
112	414/R,R&E	75018	750184	TW	M	General	Financial Services 414	Preparation of updates to financial model.
113	414/R,R&E	75019	750194	PG	M	Study	AUIR Update 414	Preparation of Annual Update and Inventory Report (Fund 414 portion).
114							**New Wastewater 414 Projects**	
115	414/R,R&E	2008-18	TBD	AA	MP	Transmission	Orangetree Interconnection (Note: Funding begins in 2018)	Design and construction of interconnection between Orangetree WWTP and NEWRF.
116	414/R,R&E	2008-15	TBD	TC	MP	Plants	NEWRF Technical Support Projects	Technical support projects associated with renewal, replacement or rehabilitation of the NEWRF.
117	414/R,R&E	2008-16	TBD	JS	MP	Neighborhood Enhancement Program	Neighborhood Enhancement Program	Design and construction of wastewater collection system improvements.
118	414/R,R&E	2008-20	TBD	RD	MP	Transmission	Relocate FM & IQ mains on US 41 at Catalina Drive (Note: Funding begins in 2018)	Design and construction of relocated FM & IQ mains on US 41 at Catalina Drive.
119	414/R,R&E	2008-25	TBD	SS	M	Lift Station Rehab	LS Mechanical improvements - User Fee	Design and construction of lift station mechanical improvements.
120	414/R,R&E	2008-26	TBD	SS	B	Lift Station Rehab	LS Secondary FM.	Design and construction of lift station secondary force mains.
121	414/R,R&E	2008-27	TBD	TC	B	Lift Station Rehab	LS Emergency Power	Design and construction of lift station emergency power systems.
122	414/R,R&E	2008-28	TBD	SS	B	Lift Station Rehab	LS Facility rehab (Site, Structural,HVAC, Landscape & fence imp.)	Design and construction of lift station site rehabilitation.
123	414/R,R&E	2008-30	TBD	SS	MP	Lift Station Rehab	LS Spill Containment (Note: Funding begins in 2014)	Design and construction of lift station spill containment facilities.
124	414/R,R&E	2008-31	TBD	TC	B	Lift Station Rehab	LS Odor/Corrosion Control	Design and construction of lift station odor control facilities.
125	414/R,R&E	2008-33	TBD	DA	MP	SCADA	Central SCADA and Control Center	Design and construction of central SCADA system and control center
126	414/R,R&E	2008-32	TBD	AA	MP	Study	Asset Alignment and Verification (Note: Funding begins in 2018)	Project to confirm that all PUD assets are in proper ROW or easements and to make sure that all water and IQ flows are properly billed.
127							**IRRIGATION QUALITY WATER PROJECTS**	
128							**Existing Irrigation Quality Water 413 Projects**	
129	413/GD	72516	725162	PG	B	IQ	IQ Water Master Plan Updates	Preparation of Irrigation Quality Water Master Plan and Updates (Fund 413 portion).
130	413/GD	74021	740212	PG	M	IQ	Golden Gate Canal/ Stormwater Irrigation System	Design and construction of the Golden Gate Canal/Stormwater irrigation system.
131	413/GD	74076	740761	DD	B	IQ	IQ Water Booster Pump Station at Livingston Road	Design and construction of Livingston Rd. Booster Pump between Golden Gate Parkway and Pine Ridge Rd.
132	413/GD	74311	743111	DD	B	IQ	IQ Water Transmission Pipeline from NEWRF	Study, Design and Construction of irrigation quality water transmission pipeline from NEWRF.
133							**New Irrigation Quality Water 413 Projects**	
134	413/GD	2008-21	TBD	AA	MP	IQ	New IQ ASR Wells (Locations - TBD) - Engineering/Construction (Note: Funding begins in 2018)	Design and construction of new ASR wells at locations to be determined starting in FY 2018.

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	Fund/Type (A)	Project No.	WBS No.	Project Manager	Source	Project Type	Project Name	Description
135	413/GD	2008-22	TBD	WM	MP	IQ	New IQ Water Booster PS (Note: Funding begins in 2018)	Design and construction of IQ booster pumping stations.
136	413/GD	2008-23	TBD	WM	MP	IQ	IQ Water Transmission/Interconnect Pipelines (Note: Funding begins in 2018)	Design and construction of IQ Water transmission/interconnect pipelines
137							**Existing Irrigation Quality Water 414 Projects**	
138	414/R,R&E	72501	725011	SS	B	Close Out - IQ	Decommissioning of Pelican Bay WRF - Phase I	Close out project for study, design and decommissioning of Pelican Bay WRF - Phase I.
139	414/R,R&E	72501	725012	SS	B	Close Out - IQ	Decommissioning of Pelican Bay WRF - Phase II	Close out project for study, design and decommissioning of Pelican Bay WRF - Phase II.
140	414/R,R&E	72501	725013	SS	M	Close Out - IQ	Decommissioning of Pelican Bay WRF	Close out project for study, design and decommissioning of Pelican Bay WRF.
141	414/R,R&E	72516	725162	PG	B	IQ	IQ Water User Rate Study	Updates to Irrigation Quality Water User Fee Study every three years.
142	414/R,R&E	72516	725163	PG		IQ	IQ Water Master Plan Updates	Preparation of Irrigation Quality Water Master Plan and Updates (Fund 414 portion).
143	414/R,R&E	73955	739551	AA	M	Close Out - IQ	Immokalee Road Wellfield - Well #1 Relocate	Close out project for relocation of Immokalee Road Wellfield - Well #1.
144	414/R,R&E	74011	740111	AA	B	Close Out - IQ	Eagle Lakes Water Storage Pond	Close out project for construction of Eagle Lakes Water Storage Pond.
145	414/R,R&E	74015	740152	KG	M	Close Out - IQ	Misc Effluent System Improvements	Close out project for miscellaneous effluent system improvements.
146	414/R,R&E	74021	740211	PG	M	IQ	Golden Gate Canal/ Stormwater Irrigation System	Design and construction of the Golden Gate Canal/Stormwater irrigation system.
147	414/R,R&E	74023	740231	CN	B	Close Out - IQ	Pelican Bay Fire/Irrigation	Close out project for conversion of Pelican Bay Fire protection system from irrigation quality water to potable water.
148	414/R,R&E	74030	740302	AA	B	IQ	IQ Water ASR	Design and construction of irrigation quality water ASR wells.
149	414/R,R&E	74033	740331	KG	M	Close Out - IQ	Reclaimed Water Telemetry	Close out project for installation of reclaimed water telemetry.
150	414/R,R&E	74033	740332	CN	B	Close Out - IQ	IQ Backbone System SCADA WAN	Close out project for installation of reuse system SCADA wide area network.
151	414/R,R&E	74033	740333	OM		SCADA	IQ Water SCADA/Telemetry Upgrades	Design and installation of IQ Water SCADA/Telemetry upgrades.
152	414/R,R&E	74047	740471	PL	M	IQ	Reclaimed Water Automatic Meters	Design and installation of Reclaimed Water automatic meters.
153	414/R,R&E	74301	743011	RD	M	Close Out - IQ	Vanderbilt / Airport to 951 Reclaimed Water	Close out project for construction of Vanderbilt/Airport to 951 Reclaimed Water main.
154	414/R,R&E	74309	743094	OM	B	Close Out - IQ	IQ Water Rehabilitation	Close out project for IQ Water rehabilitation projects.
155	414/R,R&E	74401	744011	DD	B	IQ	IQ Water Technical Support Projects	Design and construction of various IQ Water technical support projects.
156	414/R,R&E	74402	744021	GY/BT	M	Close Out - IQ	IQ Water Technical Support	Close out project for construction of IQ Water technical support project.
157	414/R,R&E	74403	744031	SF	M	Close Out - IQ	IQ R&R 414	Close out project for IQ Water R&R Fund 414 projects
158	414/R,R&E	74405	744051	SS	M	IQ	IQ Water Source Integration	Study, design and construction of IQ Water Source Integration.
159							**New Irrigation Quality Water 414 Projects**	
160	414/R,R&E	2008-24	TBD	PL	MP	IQ	IQ Water Meter Replacement	Replacement of existing IQ water meters with new meters.

TABLE 8-2

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PUBLIC UTILITIES DIVISION

2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS FY 2008 - 2013

WASTEWATER AND IRRIGATION QUALITY WATER

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	A	B	C	D	D1	D2	E	F	G	H	I	J		K	L	M	N	O
	Fund/Type (See note 1)	**Project No.**	**WBS No.**	**Project Manager**	**Source**	**Project Type**	**Project Name**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**Summary FY 2008-2013**	**WW Treatment**	**WW Trans**	**WW Collection**	**IQ Water**
							WASTEWATER PROJECTS											
							Existing Wastewater 413 Projects											
1	413/GD	70202	702025	NB	B	General	County Utility Standards		$5,000	$5,000	$5,000	$5,000	$5,000	$25,000	$6,250	$6,250	$6,250	$6,250
2	413/GD	70413	704131	BS	M	General	Refund of Impact Fee	$5,000						$5,000	$1,250	$1,250	$1,250	$1,250
3	413/GD	72001	720011	AA	B	Land Acquisition	Southeast WRF Land Acquisition	$5,000						$5,000	$5,000			
4	413/GD	72004	720041	RD	B	Transmission	VBR Force Main - Logan Blvd. To Airport Rd.	$1,000,000						$1,000,000		$1,000,000		
5	413/GD	72005	720051	WM	B	Land Acquisition	East Central Master Pumping Station Land Acquisition	$5,000						$5,000		$5,000		
6	413/GD	72006	720061	WM	M	Close Out - Land Acquisition	East Central Master Pumping Station Land Acquisition	$9						$9		$9		
7	413/GD	72008	720081	DA	B	Close Out - Plants	SCWRF Safety Upgrades to Chemical Facilities	$2,041						$2,041	$2,041			
8	413/GD	72545	725451	WM	MP	Lift Station New	East Central Force Main, Master Pumping Station and Pretreatment Facility (Note: Funding begins in 2018)							$0		$0		
9	413/GD	72546	725461	SS	M	Close Out - Lift Station Rehab	Pump Station Improvements	$2,387,111						$2,387,111		$2,387,111		
10	413/GD	73066	730663	PG	B	Study	Wastewater Master Plan Updates	$185,935			$200,000			$385,935	$96,484	$96,484	$96,484	$96,484
11	413/GD	73079	730791	SS	B	Lift Station New	Master Pumping Station-Immokalee Road/ CR 951 (Note: Fund begins in 2015)							$0		$0		
12	413/GD	73088	730881	PG	B	Study	Biosolids Master Plan (Note: Funding begins in 2015)							$0	$0			
13	413/GD	73131	731311	RD	B	Close Out - Transmission	Immokalee Road East 16" Force Main - Phases 1 and 2	$931,619						$931,619		$931,619		
14	413/GD	73153	731531	SS	B	Lift Station New	MPS-Immokalee Road East Area "B"	$86,000						$86,000		$86,000		
15	413/GD	73155	731551	AA	B	Land Acquisition	NEWRF - Acquire Site	$10,000						$10,000	$10,000			
16	415	73156	731562	AA	MP	Plants	Northeast Water Reclamation Facility (See note 2)	$300,000						$300,000	$300,000			
17	413/GD	73157	731571	AA	B	Close Out - Land Acquisition	SEWRF-Land Acquisition Study	$16,476						$16,476	$16,476			
18	413/GD	73195	731951	SS	M	Lift Station Rehab	MPS 3.14 (Naples Heritage)	$33						$33		$33		
19	413/GD	73945	739454	SS	B	Close Out - Lift Station Rehab	Pump Station Improvements	$16,000						$16,000		$16,000		
20	413/GD	73946	739461	RD	B	Close Out - Transmission	CR 951 Force Main Upsizing	$63,969						$63,969		$63,969		
21	413/GD	73948	739481	PG	B	Close Out - Plants	NCWRF Deep Injection Wells and Pumping Station	$28,200						$28,200	$28,200			
22	413/GD	73950	739502	PS	B	Plants	NCWRF Expansion to 24.1 MGD MMADF - Solids Stream	$1,866,223						$1,866,223	$1,866,223			
23	413/GD	73950	739503	PS	B	Plants	NCWRF Exp. To 30.6 MGD MMADF						$6,380,000	$6,380,000	$6,380,000			
24	413/GD	73950	739505	PS	B	Plants	NCWRF Compliance Assurance	$381,749	$1,885,000	$5,655,000	$3,770,000			$11,691,749	$11,691,749			
25	413/ GD	73950	739507	PS	B	Plants	NCWRF Bridge the Gap				$3,480,000	$10,440,000	$6,960,000	$20,880,000	$20,880,000			
26	413/GD	73976	739761	DD	B	Plants	Upgrades for Fully Compliant IQ Water					$450,000	$450,000	$900,000	$900,000			
27	413/GD	74310	743101	TW	B	General	State Revolving Fund Procurement	$35,000						$35,000	$17,500	$17,500		
28	413/GD	75008	750081	PS	B	Study	NCWRF Capacity Analysis and Process Enhancement	$16,465						$16,465	$16,465			
29	413/GD	75009	750094	NB	MP	General	SFWMD Grant Applications - Wastewater		$7,500	$7,500	$7,500	$7,500	$8,000	$38,000	$9,500	$9,500	$9,500	$9,500
30	413/GD	75010	750102	PG	M	Study	Evaluation of Orangetree Utility System			$100,000	$50,000			$150,000	$37,500	$37,500	$37,500	$37,500
31	413/GD	75012	750122	AA	M	Plants	Project Management/ Oversight for NE Utility Facility	$240,000						$240,000	$240,000			
32	413/GD	75014	750142	PG	M	Study	Growth Management Plan Update (Update every 7 years from 2007)						$12,000	$12,000	$3,000	$3,000	$3,000	$3,000
33	413/GD	75016	750162	PG	M	Close Out - Study	Evaluation of Per Capita Level of Service	$101						$101		$51	$51	
34	413/GD	75017	750172	PG	M	Study	PUD Hydraulic Analysis	$74,280						$74,280		$74,280		
35	413/GD	75018	750183	TW	M	General	Financial Services 413 (Orangetree evaluation by PRMG)	$40,000						$40,000	$10,000	$10,000	$10,000	$10,000
36	413/GD	75019	750193	PG	M	Study	AUIR Update 413	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$72,000	$18,000	$18,000	$18,000	$18,000
37	413/GD	75020	750202	PG	M	Study	LDC Review and Amendment	$140,000		$50,000		$50,000		$240,000	$60,000	$60,000	$60,000	$60,000
38							**New Wastewater 413 Projects**											
39	413/GD	2008-1	TBD	AA	MP	Plants	SEWRF - New 4.0 mgd (Note: Funding begins in 2015)							$0	$0			

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COLLIER COUNTY GOVERNMENT

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CAPITAL IMPROVEMENT PROJECTS FY 2008 - 2013

WASTEWATER AND IRRIGATION QUALITY WATER

Greeley and Hansen

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	A	B	C	D	D1	D2	E	F	G	H	I	J		K	L	M	N	O
	Fund/Type (See note 1)	**Project No.**	**WBS No.**	**Project Manager**	**Source**	**Project Type**	**Project Name**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**Summary FY 2008-2013**	**WW Treatment**	**WW Trans**	**WW Collection**	**IQ Water**
40	413/GD	2008-2	TBD	AA	MP	Plants	SEWRF Off Site Pipelines and Interconnection (Note: Funding begins in 2016)							$0	$0			
41	413/GD	2008-5	TBD	PS	MP	Plants	SCWRF Capacity Analysis and Process Enhancement			$50,000				$50,000	$50,000			
42	413/GD	2008-6	TBD	RD	MP	Transmission	Davis Boulevard 24" Force Main from MPS 312.00 to MPS 3.14 (Note: Funding begins in 2016)							$0		$0		
43	413/GD	2008-8	TBD	PG	MP	Transmission	Transmission Pipelines to Rural Fringe Receiving Areas (Note: Funding begins in 2018)							$0		$0		
44	413/GD	2008-9	TBD	SS	MP	Lift Station New	New Master Pumping Stations for Rural Fringe Receiving Areas (Note: Funding begins in 2018)							$0		$0		
45	413/GD	2008-10	TBD	AA	MP	Lift Station New	Orangetree Capacity Improvements				$100,000	$150,000	$2,000,000	$2,250,000		$2,250,000		
46	413/GD	2008-14	TBD	AA	MP	Plants	SCWRF Capacity Improvements						$200,000	$200,000	$200,000			
47	413/GD	2008-24	TBD	SS	M	Lift Station Rehab	MPS Mechanical improvements - Impact		$3,300,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$7,300,000		$7,300,000		
48							**Total Wastewater 413 Projects**	**$7,848,211**	**$5,209,500**	**$6,879,500**	**$8,624,500**	**$12,114,500**	**$17,027,000**	**$57,703,211**	**$42,845,638**	**$14,373,555**	**$242,034**	**$241,984**
49							**Existing Wastewater 414 Projects**											
50	414/R,R&E	70078	700782	JY	B	General	Special Assessment Software	$243,564						$243,564	$60,891	$60,891	$60,891	$60,891
51	414/R,R&E	70202	702022	NB	B	General	County Utility Standards	$25,000	$5,000	$5,000	$5,000	$5,000	$5,000	$50,000	$12,500	$12,500	$12,500	$12,500
52	414/R,R&E	72008	720082	DA	B	Close Out - Plants	SCWRF Safety Upgrades to Chemical Facilities	$4,261						$4,261	$4,261			
53	414/R,R&E	72500	725001	JS	B	Collection	South County I&I Implementation	$1,120,141	$50,000	$50,000				$1,220,141			$1,220,141	
54	414/R,R&E	72503	725031	TT	B	Collection	Sewer System Mapping (Note: Funding begins in 2014)							$0			$0	
55	414/R,R&E	72504	725042	TC	M	Close Out - Transmission	2005 MPS Facility Renewal	$622						$622		$622		
56	414/R,R&E	72505	725051	CN	B	Close Out - Security	Security Upgrades	$12,994						$12,994	$12,994			
57	414/R,R&E	72505	725052	CN	B	Security	Future Security Upgrades	$64,044	$75,000	$50,000	$50,000	$50,000	$50,000	$339,044	$339,044			
58	414/R,R&E	72506	725061	TC	B	Close Out - Plants	NCWRF Renew Sludge Pump Rooms	$55,600						$55,600	$55,600			
59	414/R,R&E	72508	725081	OM	B	Close Out - Plants	SCWRF Reliability Improvements	$407,431						$407,431	$407,431			
60	414/R,R&E	72508	725082	OM	B	Close Out - Plants	2005 SCWRF Reliability Improvements	$110,158						$110,158	$110,158			
61	414/R,R&E	72509	725091	DA	B	Close Out - Plants	SCWRF Process Control Bldg Expansion	$139,835						$139,835	$139,835			
62	414/R,R&E	72510	725101	DA	B	Close Out - Plants	NCWRF Process Control Bldg Expansion	$12,054						$12,054	$12,054			
63	414/R,R&E	72512	725121	TC	M	Close Out - Plants	NCWRF Reliability Improvements	$712						$712	$712			
64	414/R,R&E	72514	725141	CN	B	Close Out - SCADA	SCWRF SCADA Architecture Reliability Improvements	$33,577						$33,577	$33,577			
65	414/R,R&E	72517	725171	DE	B	Close Out - Study	CMOM and Staff Optimization	$48,745						$48,745	$12,186	$12,186	$12,186	$12,186
66	414/R,R&E	72523	725231	CN	B	Close Out - Collection	Collections Building Renovation	$100,000						$100,000			$100,000	
67	414/R,R&E	72528	725281	RD	B	Transmission	Replace Hitching Post Force Main	$1,400						$1,400		$1,400		
68	414/R,R&E	72532	725321	TC	B	Close Out - Plants	2005 NCWRF Rehabilitation	$172,925						$172,925	$172,925			
69	414/R,R&E	72534	725341	OM	B	Close Out - Plants	2005 SCWRF Rehabilitation	$397,901						$397,901	$397,901			
70	414/R,R&E	72540	725401	CN	B	Close Out - Plants	Electronic O & M Manuals	$90,000						$90,000	$90,000			
71	414/R,R&E	72541	725411	CN	B	SCADA	WW SCADA Software & Support Renewals	$88,441	$50,000	$50,000	$50,000	$50,000	$50,000	$338,441	$338,441			
72	414/R,R&E	72542	725421	JS	B	Collection	North County I&I Implementation	$577,175	$50,000					$627,175			$627,175	
73	414/R,R&E	73045	730451	RD	B	Transmission	FDOT Joint Project Agreements - Sewer	$423,281	$50,000	$50,000	$50,000	$50,000	$50,000	$673,281		$336,641	$336,641	
74	414/R,R&E	73050	730501	JS	B	Collection	Sewer Line Rehab (I&I Implementation)	$1,410,214	$230,000	$250,000	$250,000	$250,000	$250,000	$2,640,214			$2,640,214	
75	414/R,R&E	73051	730511	JS	M	Close Out - Lift Station New	Pumping ABD Lift Station	$2,724						$2,724		$2,724		
76	414/R,R&E	73051	730513	JS	M	Close Out - Lift Station Rehab	2006 Pump/Lift Station Rehab	$3,109						$3,109		$3,109		
77	414/R,R&E	73064	730641	TC	M	Close Out - Transmission	Odor/Corrosion Control	$280,854						$280,854		$280,854		
78	414/R,R&E	73064	730642	TC	M	Close Out - Transmission	Odor/Corrosion Control	$95,000						$95,000		$95,000		
79	414/R,R&E	73065	730651	RD	B	Transmission	CCDOT Utility Relocates	$1,848	$10,000	$10,000	$10,000	$10,000	$10,000	$51,848		$45,108	$6,740	

TABLE 8-2

COLLIER COUNTY GOVERNMENT

PUBLIC UTILITIES DIVISION

2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS FY 2008 - 2013

WASTEWATER AND IRRIGATION QUALITY WATER

Greeley and Hansen

24-Jun-08

	A	B	C	D	D1	D2	E	F	G	H	I	J		K	L	M	N	O
	Fund/Type (See note 1)	**Project No.**	**WBS No.**	**Project Manager**	**Source**	**Project Type**	**Project Name**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**Summary FY 2008-2013**	**WW Treatment**	**WW Trans**	**WW Collection**	**IQ Water**
80	414/R,R&E	73071	730712	CN	B	Plants	Energy Efficiency Enhancements	$27,000						$27,000	$27,000			
81	414/R,R&E	73072	730721	CN	B	Close Out - General	Public Utilities Operations Center	$126,000						$126,000			$126,000	
82	414/R,R&E	73084	730841	SS	M	Close Out - Lift Station Rehab	Improve Access to Pump Station	$6,000						$6,000		$6,000		
83	414/R,R&E	73165	731651	PG	B	Study	Asset Management Assistance	$203,677						$203,677	$50,919	$50,919	$50,919	$50,919
84	414/R,R&E	73301	733011	RD	M	Close Out - Transmission	Relocate Underground Utilities VBR-Airport to CR-951	$1,250						$1,250		$1,250		
85	414/R,R&E	73306	733061	RD	M	Close Out - Transmission	Rattlesnake Hammock Road to CR-951 - Relocate	$306						$306		$306		
86	414/R,R&E	73922	739221	CN	B	SCADA	Wastewater Collections System SCADA/Telemetry	$333,435	$100,000	$150,000	$150,000	$150,000	$150,000	$1,033,435		$134,347	$899,088	
87	414/R,R&E	73943	739431	RD	B	Close Out - Transmission	Immokalee 30" FM Pigging Station	$237,486						$237,486		$237,486		
88	414/R,R&E	73944	739441	JY	B	General	Billing System	$261,380						$261,380	$65,345	$65,345	$65,345	$65,345
89	414/R,R&E	73950	739504	PS	B	Plants	NCWRF Exp. To 30.6 MGD MMADF						$953,333	$953,333	$953,333			
90	414/R,R&E	73950	739506	PS	B	Plants	NCWRF Compliance Assurance	$494,211	$281,667	$845,000	$563,334			$2,184,212	$2,184,212			
91	414/R,R&E	73950	739508	PS	B	Plants	NCWRF Bridge the Gap				$520,000	$1,560,000	$1,040,000	$3,120,000	$3,120,000			
92	414/R,R&E	73957	739571	DA	M	Close Out - Plants	NCWRF Bleach Piping	$3,856						$3,856	$3,856			
93	414/R,R&E	73958	739581	SF	M	Close Out - Lift Station Rehab	Purchase Generators for LS Reliability	$2,000						$2,000	$2,000			
94	414/R,R&E	73960	739601	MK	B	Collection	Household Fats, Oils and Grease Campaign	$5,000						$5,000			$5,000	
95	414/R,R&E	73961	739611	MG	B	Close Out - Plants	Electronic Discharge Monitoring Report	$1,961						$1,961	$1,961			
96	414/R,R&E	73963	739631	DA	B	Close Out - Plants	Renovate SCWRF Wastewater Lab	$118,961						$118,961	$118,961			
97	414/R,R&E	73964	739641	CN	B	SCADA	Wastewater Facilities SCADA Network Improvements for Plants	$210,000	$50,000	$75,000	$75,000	$75,000	$75,000	$560,000	$560,000			
98	414/R,R&E	73966	739661	DD	B	Plants	NCWRF Bleach System	$1,350,000	$500,000					$1,850,000	$1,850,000			
99	414/R,R&E	73966	739662	DD	M	Plants	NCWRF Bleach System	$445,684	$1,100,000					$1,545,684	$1,545,684			
100	414/R,R&E	73968	739681	TC	B	Plants	NCWRF Technical Support Projects	$938,285	$1,500,000	$600,000	$600,000	$600,000	$600,000	$4,838,285	$4,838,285			
101	414/R,R&E	73969	739691	OM	B	Plants	SCWRF Technical Support Projects	$814,466	$600,000	$600,000	$600,000	$600,000	$600,000	$3,814,466	$3,814,466			
102	414/R,R&E	73970	739701	SS	B	Close Out - Lift Station Rehab	Pump Station Improvements	$1,350,000						$1,350,000		$1,350,000		
103	414/R,R&E	73972	739721	JS	B	Neighborhood Enhancement Program	Wyndemere Collection System Rehabilitation	$800,000						$800,000			$800,000	
104	414/R,R&E	73973	739731	KG	M	Close Out - Plants	NCWRF R&R (414)	$100,000						$100,000	$100,000			
105	414/R,R&E	73974	739741	TC	M	Close Out - Collection	Collections R&R	$206,087						$206,087			$206,087	
106	414/R,R&E	73975	739751	TC	M	Close Out - Plants	NCWRF Odor Control	$200,000						$200,000	$200,000			
107	414/R,R&E	74033	740333	CN	B	SCADA	IQ System SCADA/Telemetry Upgrades	$435,142	$25,000	$25,000	$25,000	$25,000	$25,000	$560,142				$560,142
108	414/R,R&E	74050	740501	OM	B	Close Out - General	Eagle Lakes Nature Interpretive Center	$9,736						$9,736	$9,736			
109	414/R,R&E	75007	750072	PG	B	Study	Wastewater Master Plan Updates	$142,803			$100,000			$242,803	$60,701	$60,701	$60,701	$60,701
110	414/R,R&E	75008	750082	PS	B	Close Out - Plants	NCWRF Capacity Analysis and Process Enhancement	$10,905						$10,905	$10,905			
111	414/R,R&E	75009	750092	NB	B	General	SFWMD Grant Applications - Wastewater	$29,500	$7,500	$7,500	$7,500	$7,500	$8,000	$67,500	$16,875	$16,875	$16,875	$16,875
112	414/R,R&E	75018	750184	TW	M	General	Financial Services 414	$40,000						$40,000	$10,000	$10,000	$10,000	$10,000
113	414/R,R&E	75019	750194	PG	M	Study	AUIR Update 414	$12,000	$12,000	$12,000	$12,000	$12,000	$12,000	$72,000	$18,000	$18,000	$18,000	$18,000
114							**New Wastewater 414 Projects**											
115	414/R,R&E	2008-15	TBD	TC	MP	Plants	NEWRF Technical Support Projects (Note: Funding begins in 2016)							$0	$0			
116	414/R,R&E	2008-16	TBD	JS	MP	Neighborhood Enhancement Program	Neighborhood Enhancement Program	$275,000	$500,000	$500,000	$500,000	$500,000	$500,000	$2,775,000			$2,775,000	
117	414/R,R&E	2008-18	TBD	AA	MP	Transmission	Orangetree Interconnection (Note: Funding begins in 2018)							$0		$0		
118	414/R,R&E	2008-20	TBD	RD	MP	Transmission	Relocate FM & IQ mains on US41 at Catalina Drive (Note: Funding begins in 2018)							$0		$0		$0

TABLE 8-2

COLLIER COUNTY GOVERNMENT

PUBLIC UTILITIES DIVISION

2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS FY 2008 - 2013

WASTEWATER AND IRRIGATION QUALITY WATER

Greeley and Hansen

24-Jun-08

	A	B	C	D	D1	D2	E	F	G	H	I	J		K	L	M	N	O
	Fund/Type (See note 1)	**Project No.**	**WBS No.**	**Project Manager**	**Source**	**Project Type**	**Project Name**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**Summary FY 2008-2013**	**WW Treatment**	**WW Trans**	**WW Collection**	**IQ Water**
119	414/R,R&E	2008-25	TBD	SS	M	Lift Station Rehab	LS Mechanical improvements - User Fee	$300,000	$500,000	$600,000	$600,000	$600,000	$600,000	$3,200,000		$3,200,000		
120	414/R,R&E	2008-26	TBD	SS	B	Lift Station Rehab	LS Secondary FM.		$50,000	$300,000	$300,000	$300,000	$300,000	$1,250,000		$1,250,000		
121	414/R,R&E	2008-27	TBD	TC	B	Lift Station Rehab	LS Emergency Power	$1,107	$150,000	$150,000	$150,000	$150,000	$150,000	$751,107		$751,107		
122	414/R,R&E	2008-28	TBD	SS	B	Lift Station Rehab	LS Facility rehab (Site, Structural,HVAC, Landscape & fence imp.)	$95,000	$75,000	$85,000	$85,000	$85,000	$50,000	$475,000		$475,000		
123	414/R,R&E	2008-30	TBD	SS	MP	Lift Station Rehab	LS Spill Containment (Note: Funding begins in 2014)							$0		$0		
124	414/R,R&E	2008-31	TBD	TC	B	Lift Station Rehab	LS Odor/Corrosion Control	$250,000	$200,000	$200,000	$200,000	$200,000	$200,000	$1,250,000		$1,250,000		
125	414/R,R&E	2008-33	TBD	DA	MP	SCADA	Central SCADA and Control Center	$400,000						$400,000	$100,000	$100,000	$100,000	$100,000
126	414/R,R&E	2008-32	TBD	AA	MP	Study	Asset Alignment and Verification (Note: Funding begins in 2018)							$0				$0
127							**Total Wastewater 414 Projects**	**$16,161,848**	**$6,171,167**	**$4,614,500**	**$4,902,834**	**$5,279,500**	**$5,678,333**	**$42,808,182**	**$21,862,749**	**$9,828,370**	**$10,149,503**	**$967,559**
128							**Total Wastewater 413 Projects**	**$7,848,211**	**$5,209,500**	**$6,879,500**	**$8,624,500**	**$12,114,500**	**$17,027,000**	**$57,703,211**	**$42,845,638**	**$14,373,555**	**$242,034**	**$241,984**
129							**TOTAL WASTEWATER PROJECTS**	**$24,010,060**	**$11,380,667**	**$11,494,000**	**$13,527,334**	**$17,394,000**	**$22,705,333**	**$100,511,394**	**$64,708,387**	**$24,201,926**	**$10,391,538**	**$1,209,543**
130							**IRRIGATION QUALITY WATER PROJECTS**											
131							**Existing Irrigation Quality Water 413 Projects**											
132	413/GD	72516	725163	PG	B	IQ	IQ Water Master Plan Updates	$100,000			$50,000			$150,000				$150,000
133	413/GD	74021	740212	PG	M	IQ	Golden Gate Canal/ Stormwater Irrigation System			$2,000,000				$2,000,000				$2,000,000
134	413/GD	74076	740761	DD	B	IQ	IQ Water Booster Pump Station at Livingston Road	$100,000						$100,000		$100,000		
135	413/GD	74311	743111	DD	B	IQ	IQ Water Transmission Pipeline from NEWRF	$1,122,298						$1,122,298	$561,149	$561,149		
136							**New Irrigation Quality Water 413 Projects**											
137	413/GD	2008-21	TBD	AA	MP	IQ	New IQ ASR Wells (Locations - TBD) - Engineering/Construction (Note: Funding begins in 2018)							$0				$0
138	413/GD	2008-22	TBD	WM	MP	IQ	New IQ Water Booster PS (Note: Funding begins in 2018)							$0		$0		$0
139	413/GD	2008-23	TBD	WM	MP	IQ	IQ Water Transmission/Interconnect Pipelines (Note: Funding begins in 2018)							$0		$0		
140							**Total Irrigation Quality Water 413 Projects**	**$1,322,298**	**$0**	**$2,000,000**	**$50,000**	**$0**	**$0**	**$3,372,298**	**$561,149**	**$661,149**	**$0**	**$2,150,000**
141							**Existing Irrigation Quality Water 414 Projects**											
142	414/R,R&E	72501	725011	SS	B	Close Out - IQ	Decommissioning of Pelican Bay WRF - Phase I	$288,519						$288,519	$288,519			
143	414/R,R&E	72501	725012	SS	B	Close Out - IQ	Decommissioning of Pelican Bay WRF - Phase II	$48,000						$48,000	$48,000			
144	414/R,R&E	72501	725013	SS	M	Close Out - IQ	Decommissioning of Pelican Bay WRF	$442,695						$442,695				$442,695
145	414/R,R&E	72516	725162	PG	B	IQ	IQ Water User Rate Study	$85,623			$75,000			$160,623				$160,623
146	414/R,R&E	73955	739551	AA	M	Close Out - IQ	Immokalee Road Wellfield - Well #1 Relocate	$24,385						$24,385	$24,385			
147	414/R,R&E	74011	740111	AA	B	Close Out - IQ	Eagle Lakes Water Storage Pond	$5,000						$5,000				$5,000
148	414/R,R&E	74015	740152	KG	M	Close Out - IQ	Misc Effluent System Improvements	$5,509						$5,509	$5,509			
149	414/R,R&E	74021	740211	PG	M	IQ	Golden Gate Canal/ Stormwater Irrigation System							$0				$0
150	414/R,R&E	74023	740231	CN	B	Close Out - IQ	Pelican Bay Fire/Irrigation	$1,658,227						$1,658,227				$1,658,227
151	414/R,R&E	74030	740302	AA	B	IQ	IQ Water ASR	$672,394		$700,000				$1,372,394				$1,372,394
152	414/R,R&E	74033	740331	KG	M	Close Out - IQ	Reclaimed Water Telemetry	$23,864						$23,864				$23,864
153	414/R,R&E	74033	740332	CN	B	Close Out - IQ	IQ Backbone System SCADA WAN	$160,929						$160,929				$160,929
154	414/R,R&E	74047	740471	PL	M	IQ	Reclaimed Water Automatic Meters	$41,000						$41,000				$41,000
155	414/R,R&E	74301	743011	RD	M	Close Out - IQ	Vanderbilt / Airport to 951 Reclaimed Water	$1,250						$1,250				$1,250
156	414/R,R&E	74309	743094	OM	B	Close Out - IQ	IQ Water Rehab.	$50,199						$50,199				$50,199
157	414/R,R&E	74401	744011	OM	B	IQ	IQ Water Technical Support Projects	$482,165	$50,000	$50,000	$50,000	$50,000	$50,000	$732,165				$732,165
158	414/R,R&E	74402	744021	GY/BT	M	Close Out - IQ	IQ Water Technical Support	$13,000						$13,000				$13,000
159	414/R,R&E	74403	744031	SF	M	Close Out - IQ	IQ R&R 414	$33,281						$33,281				$33,281

TABLE 8-2

COLLIER COUNTY GOVERNMENT

PUBLIC UTILITIES DIVISION

2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS FY 2008 - 2013

WASTEWATER AND IRRIGATION QUALITY WATER

Greeley and Hansen

24-Jun-08

	A	B	C	D	D1	D2	E	F	G	H	I	J		K	L	M	N	O
	Fund/Type (See note 1)	**Project No.**	**WBS No.**	**Project Manager**	**Source**	**Project Type**	**Project Name**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**Summary FY 2008-2013**	**WW Treatment**	**WW Trans**	**WW Collection**	**IQ Water**
160	414/R,R&E	74405	744051	SS	M	IQ	IQ Water Source Integration	$2,000						$2,000				$2,000
161							**New Irrigation Quality Water 414 Projects**											
162	414/R,R&E	2008-24	TBD	PL	MP	IQ	IQ Water Meter Replacement	$72,000						$72,000				$72,000
163							**Total Irrigation Quality Water 414 Projects**	**$4,110,039**	**$50,000**	**$750,000**	**$125,000**	**$50,000**	**$50,000**	**$5,135,039**	**$366,413**	**$0**	**$0**	**$4,768,626**
164							**TOTAL IQ WATER PROJECTS**	**$5,432,337**	**$50,000**	**$2,750,000**	**$175,000**	**$50,000**	**$50,000**	**$8,507,337**	**$927,562**	**$661,149**	**$0**	**$6,918,626**
165							**TOTAL WASTEWATER AND IRRIGATION QUALITY WATER FUNDS ALLOCATED PER FY**	**$29,442,397**	**$11,430,667**	**$14,244,000**	**$13,702,334**	**$17,444,000**	**$22,755,333**	**$109,018,731**	**$65,635,949**	**$24,863,075**	**$10,391,538**	**$8,128,169**

Notes:

1. 413/GD = Growth Driven

   414/R,R&E = Renewal, Replacement & Enhancement

2. Northeast Water Reclamation Facility will be funded from Fund 415

3. Costs based on 2008 dollars.

Column D1: MP = Existing in 2005 Master Plan update

M = Manifesto Item

B = Item in both 2005 Master Plan Update and Manifesto

TABLE 8-3

COLLIER COUNTY GOVERNMENT

PUBLIC UTILITIES DIVISION

2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS FY 2014 - 2027

WASTEWATER AND IRRIGATION QUALITY WATER

Greeley and Hansen

24-Jun-08

	A	B	C	D	E	F	G	H	I	J	K	L	M
	Fund/Type (1) (2)	**Project No.**	**WBS No.**	**Project Manager**	**Project Type**	**Project Name**	**FY 2014-2017 (3)**	**FY 2018-2022 (3)**	**FY 2023-2027 (3)**	**Summary FY 2014 - 2027**	**WW Treatment**	**WW Trans**	**WW Collection**	**IQ Water**
						WASTEWATER PROJECTS								
						Wastewater 413 Projects								
1	413/GD	70202	702025	NB	General	County Utility Standards	$107,000	$190,000	$279,000	$576,000	$144,000	$144,000	$144,000	$144,000
2	413/GD	72001	720011	AA	Land Acquisition	SEWRF Land Acquisition	$15,869,000	$4,570,000		$20,439,000		$20,439,000		
3	413/GD	72005	720051	WM	Land Acquisition	East Central Master Pumping Station Land Acquisition		$4,570,000		$4,570,000		$4,570,000		
4	413/GD	72545	725451	WM	Lift Station New	East Central Force Main, Master Pumping Station and Pretreatment Facility		$12,740,000		$12,740,000		$12,740,000		
5	413/GD	73066	730663	PG	Study	Wastewater Master Plan Updates	$572,000	$1,013,000	$1,489,000	$3,074,000	$768,500	$768,500	$768,500	$768,500
6	413/GD	73079	730791	SS	Lift Station New	Master Pumping Station-Immokalee Road/ CR 951	$5,775,000			$5,775,000		$5,775,000		
7	413/GD	73088	730881	PG	Study	Biosolids Master Plan	$159,000	$233,000	$343,000	$735,000	$735,000			
8	413/GD	73153	731531	SS	Lift Station New	MPS-Immokalee Road East Area "B"	$5,775,000			$5,775,000		$5,775,000		
9	415	73156	731562	AA	Plants	NEWRF (See Note 4)	$82,660,000			$82,660,000	$82,660,000			
10	413/GD	73195	731951	SS	Lift Station New	MPS 3.14 (Naples Heritage)		$7,902,000		$7,902,000		$7,902,000		
11	413/GD	73945	739451	SS	Lift Station Rehab	Future Pump Station Improvements	$2,860,000	$5,066,000	$7,444,000	$15,370,000		$15,370,000		
12	413/GD	73950	739503	PS	Plants	NCWRF Expansion to 30.6 MGD (See Note 4)	$31,900,000			$31,900,000	$31,900,000			
13	413/GD	75009	750094	NB	General	SFWMD Grant Applications	$57,000	$101,000	$149,000	$307,000	$76,750	$76,750	$76,750	$76,750
14	413/GD	75012	750122	AA	Plants	Program Management and Oversight for NE Utility Facility	$8,265,000			$8,265,000	$8,265,000			
15	413/GD	75014	750142	PG	Study	Growth Management Plan Update	$86,000	$152,000	$223,000	$461,000	$115,250	$115,250	$115,250	$115,250
16	413/GD	75019	750193	PG	Study	AUIR Update	$86,000	$152,000	$223,000	$461,000	$115,250	$115,250	$115,250	$115,250
17	413/GD	75020	750202	PG	Study	LDC Review and Amendment	$172,000	$381,000	$371,000	$924,000	$231,000	$231,000	$231,000	$231,000
18	413/GD	2008-1	TBD	AA	Plants	SEWRF- New 4.0 mgd WRF (See Note 4)	$77,970,000	$11,400,000		$89,370,000	$89,370,000			
19	413/GD	2008-2	TBD	AA	Plants	SEWRF Offsite Pipelines and Interconnection		$21,013,000		$21,013,000		$21,013,000		
20	413/GD	2008-3	TBD	TBD	Plants	SEWRF- 2.0 mgd Expansion (See Note 4)			$54,560,000	$54,560,000	$54,560,000			
21	413/GD	2008-6	TBD	RD	Transmission	Davis Boulevard 24" Force Main from new MPS 312.00 to existing MPS 314.00		$7,185,000		$7,185,000		$7,185,000		
22	413/GD	2008-9	TBD	PG	Transmission	Transmission Pipelines to Rural Fringe Receiving Areas	$7,151,000	$25,331,000	$55,830,000	$88,312,000		$88,312,000		
23	413/GD	2008-8	TBD	SL	Lift Station New	New Master Pumping Stations for Rural Fringe Receiving Areas	$4,290,000	$12,666,000	$18,610,000	$35,566,000		$35,566,000		
24	413/GD	2008-10	TBD	AA	Lift Station New	Orangetree Capacity Improvements	$3,575,000			$3,575,000		$3,575,000		
25	413/GD	2008-14	TBD	AA	Plants	SCWRF Capacity Improvements	$1,430,000	$2,533,000	$3,722,000	$7,685,000	$7,685,000			
26						**Subtotal Wastewater 413 Projects**	**$248,759,000**	**$117,198,000**	**$143,243,000**	**$509,200,000**	**$276,626,000**	**$229,673,000**	**$1,451,000**	**$1,451,000**
27						CONTINGENCY (See Note 5)	$5,623,000	$21,160,000	$17,737,000	**$44,520,000**	$24,186,000	$20,081,000	$127,000	$127,000
28						**Total Wastewater 413 Projects**	**$254,382,000**	**$138,358,000**	**$160,980,000**	**$553,720,000**	**$300,812,000**	**$249,754,000**	**$1,578,000**	**$1,578,000**
29						**Wastewater 414 Projects**								
30	414/R,R&E	70202	702022	NB	General	County Utility Standards	$107,000	$190,000	$279,000	$576,000	$144,000	$144,000	$144,000	$144,000
31	414/R,R&E	72500	725001	JS	Collection	South County I&I Implementation	$1,073,000	$1,900,000	$2,791,000	$5,764,000			$5,764,000	
32	414/R,R&E	72503	725031	TT	Collection	Sewer System Mapping	$215,000	$380,000	$558,000	$1,153,000		$576,500	$576,500	
33	414/R,R&E	72504	725043	TC	Transmission	MPS and Sub-MPS Electrical and Instrumentation / Control Renewal (Permanent Generators)	$1,430,000			$1,430,000		$1,430,000		
34	414/R,R&E	72505	725052	CN	Security	Security Upgrades (See Note 4)	$715,000	$1,267,000	$1,861,000	$3,843,000	$3,843,000			
35	414/R,R&E	72541	725411	CN	SCADA	WW SCADA Software & Support Renewals	$358,000	$633,000	$930,000	$1,921,000	$1,921,000			
36	414/R,R&E	72542	725421	JS	Collection	North County I&I Implementation	$1,073,000	$1,900,000	$2,791,000	$5,764,000			$5,764,000	
37	414/R,R&E	73045	730451	RD	Transmission	FDOT Joint Projects	$1,144,000	$2,026,000	$2,978,000	$6,148,000		$3,074,000	$3,074,000	
38	414/R,R&E	73050	730501	JS	Collection	Sewer Line Rehab (See Note 4)	$2,860,000	$7,599,000	$14,888,000	$25,347,000			$25,347,000	
39	414/R,R&E	73082	730821	SS	Lift Station Rehab	Pump/Lift Station Replacement (See Note 4)	$1,430,000	$2,533,000	$3,722,000	$7,685,000		$7,685,000		
40	414/R,R&E	73922	739221	CN	SCADA	Wastewater Collections System SCADA/Telemetry (See Note 4)	$1,788,000	$3,166,000	$4,652,000	$9,606,000		1,248,780	$8,357,220	

TABLE 8-3

COLLIER COUNTY GOVERNMENT

PUBLIC UTILITIES DIVISION

2008 WASTEWATER MASTER PLAN UPDATE

CAPITAL IMPROVEMENT PROJECTS FY 2014 - 2027

WASTEWATER AND IRRIGATION QUALITY WATER

Greeley and Hansen

24-Jun-08

	A	B	C	D		E	F	G	H	I	J	K	L	M
	Fund/Type (1) (2)	**Project No.**	**WBS No.**	**Project Manager**	**Project Type**	**Project Name**	**FY 2014-2017 (3)**	**FY 2018-2022 (3)**	**FY 2023-2027 (3)**	**Summary FY 2014 - 2027**	**WW Treatment**	**WW Trans**	**WW Collection**	**IQ Water**
41	414/R,R&E	73950	739504	PS	Plants	NCWRF Expansion to 30.6 MGD (See Note 4)	$4,766,667			$4,766,667	$4,766,667			
42	414/R,R&E	73964	739641	CN	SCADA	Wastewater SCADA Network Improvements for Plants	$1,788,000	$3,166,000	$4,652,000	$9,606,000	$9,606,000			
43	414/R,R&E	73968	739681	TC	Plants	NCWRF Technical Support Projects (See Note 4)	$4,290,000	$7,599,000	$11,166,000	$23,055,000	$23,055,000			
44	414/R,R&E	73969	739691	OM	Plants	SCWRF Technical Support Projects (See Note 4)	$2,145,000	$3,800,000	$5,583,000	$11,528,000	$11,528,000			
45	414/R,R&E	75007	750072	PG	Study	Wastewater Master Plan Updates	$572,000	$1,013,000	$1,489,000	$3,074,000	$768,500	$768,500	$768,500	$768,500
46	414/R,R&E	75009	750092	NB	General	SFWMD Grant Applications	$57,000	$101,000	$149,000	$307,000	$76,750	$76,750	$76,750	$76,750
47	414/R,R&E	75019	750194	PG	Study	AUIR Update	$86,000	$152,000	$223,000	$461,000	$115,250	$115,250	$115,250	$115,250
48	414/R,R&E	2008-15	TBD	TC	Plants	NEWRF Technical Support Projects (See Note 4)	$1,430,000	$2,533,000	$3,722,000	$7,685,000	$7,685,000			
49	414/R,R&E	2008-30	TBD	SS	Lift Station Rehab	LS Spill Containment (Funding begins in 2014)	$2,145,000			$2,145,000		$2,145,000		
50						**Subtotal Wastewater 414 Projects**	**$29,473,000**	**$39,958,000**	**$62,434,000**	**$131,865,000**	**$63,509,000**	**$17,264,000**	**$49,987,000**	**$1,105,000**
51						CONTINGENCY (See Note 5)	$1,005,000	$2,292,000	$3,368,000	**$6,665,000**	$3,210,000	873,000	$2,527,000	$56,000
52						**Total Wastewater 414 Projects**	**$30,478,000**	**$42,250,000**	**$65,802,000**	**$138,530,000**	**$66,719,000**	**$18,137,000**	**$52,514,000**	**$1,161,000**
53						**Total Wastewater 413 Projects**	**$254,382,000**	**$138,358,000**	**$160,980,000**	**$553,720,000**	**$300,812,000**	**$249,754,000**	**$1,578,000**	**$1,578,000**
54						**TOTAL WASTEWATER PROJECTS**	**$284,860,000**	**$180,608,000**	**$226,782,000**	**$692,250,000**	**$367,531,000**	**$267,891,000**	**$54,092,000**	**$2,739,000**
55						**IRRIGATION QUALITY WATER PROJECTS**								
56						**Irrigation Quality Water 413 Projects**								
57	413/GD	72516	725162	PG	IQ	IQ Water Master Plan Updates	$172,000	$381,000	$371,000	$924,000				$924,000
58	413/GD	74076	740761	DD	IQ	IQ Booster Pump Station at Livingston Road	$2,277,000			$2,277,000		$2,277,000		
59	413/GD	74311	743111	DD	IQ	IQ Water Transmission Pipeline from NEWRF	$5,935,000			$5,935,000	$2,967,500	$2,967,500		
60	413/GD	2008-21	TBD	AA	IQ	New IQ ASR Wells (Locations - TBD)		$4,318,000	$9,517,000	$13,835,000				$13,835,000
61	413/GD	2008-22	TBD	WM	IQ	New IQ Water Booster PS		$1,727,000	$317,000	$2,044,000		$2,044,000		
62	413/GD	2008-23	TBD	WM	IQ	IQ Water Transmission/Interconnect Pipelines		$2,159,000	$6,344,000	$8,503,000				$8,503,000
63						**Subtotal Irrigation Quality Water 413 Projects**	**$8,384,000**	**$8,585,000**	**$16,549,000**	**$33,518,000**	**$2,968,000**	**$7,289,000**		**$23,262,000**
64						CONTINGENCY (See Note 5)	$838,000	$1,717,000	$3,310,000	**$5,865,000**	$519,000	$1,275,000		$4,070,000
65						**Total Irrigation Quality Water 413 Projects**	**$9,222,000**	**$10,302,000**	**$19,859,000**	**$39,383,000**	**$3,487,000**	**$8,564,000**		**$27,332,000**
66						**Irrigation Quality Water 414 Projects**								
67	414/R,R&E	72516	725163	PG	IQ	IQ Water Master Plan Updates	$172,000	$381,000	$371,000	$924,000				$924,000
68	414/R,R&E	74030	740302	AA	IQ	IQ Water ASR	$3,575,000			$3,575,000				$3,575,000
69	414/R,R&E	74033	740333	CN	SCADA	IQ Water SCADA/Telemetry Upgrades	$1,716,000	$3,040,000	$4,466,000	$9,222,000				$9,222,000
70	414/R,R&E	74401	744011	OM	IQ	IQ Water Technical Support Projects (See Note 4)	$1,788,000	$3,166,000	$4,652,000	$9,606,000				$9,606,000
71						**Subtotal Irrigation Quality Water 414 Projects**	**$7,251,000**	**$6,587,000**	**$9,489,000**	**$23,327,000**				**$23,327,000**
72						CONTINGENCY (See Note 5)	$546,000	$684,000	$967,000	$2,197,000				$2,197,000
73						**Total Irrigation Quality Water 414 Projects**	**$7,797,000**	**$7,271,000**	**$10,456,000**	**$25,524,000**				**$25,524,000**
74						**Total Irrigation Quality Water 413 Projects**	**$9,222,000**	**$10,302,000**	**$19,859,000**	**$39,383,000**	**$3,487,000**	**$8,564,000**		**$27,332,000**
75						**TOTAL IRRIGATION QUALITY WATER PROJECTS**	**$17,019,000**	**$17,573,000**	**$30,315,000**	**$64,907,000**	**$3,487,000**	**$8,564,000**		**$52,856,000**
76						**TOTAL WASTEWATER AND IRRIGATION QUALITY WATER FUNDS ALLOCATED PER PERIOD**	**$301,879,000**	**$198,181,000**	**$257,097,000**	**$757,157,000**	**$371,018,000**	**$276,455,000**	**$54,092,000**	**$55,595,000**

Notes:

1. 413/GD = Growth Driven
2. 414/R,R&E = Renewal, Replacement & Enhancement
3. Costs based on 2008 dollars with eight percent inflation per year.
4. No contingency costs for these projects are applied to the total costs.
5. Contingencies are applied to the total costs as follows (except for projects associated with Note 4):

   10 Percent Contingency for Projects in FY 2014 to FY 2017

   20 Percent Contingency for Projects in FY 2018 to FY 2027