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City of Punta Gorda Comprehensive Plan

Infrastructure Element

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I. EXECUTIVE SUMMARY

As identified in 9J5.011, the purpose of the *Infrastructure Element* is to provide for necessary public facilities and services correlated to future land use projections. The element is divided into three sections: P*otable Water & Sanitary Sewer, Solid Waste, and Stormwater Management*. There are no aquifer recharge areas within City limits; therefore, this component is not a part of the City's Infrastructure Element.

The City utilizes the availability of infrastructure as a tool for determining where and when growth can occur. Potable water, sanitary sewer, solid waste and stormwater management facilities are constructed and operated in accordance with all applicable federal, state, and local regulations. Most existing regulations are based on federal guidelines mandated by the United States Environmental Protection Agency (EPA).

The P*otable Water and Sanitary Sewer Section* provides services to approximately 33,700 and 25,450 residents respectively within the City's utility service area. The City initiates planning studies to assist in developing the most reliable, cost-effective strategy for supplying potable water and sewer service to its customers. Since its conception in 1965, the City's water utility has taken a proactive approach to water supply planning, design, and construction.

The City considers conservation a beneficial method to reduce total water demand. Although the City currently meets the water demand goal of the Southern Water Use Caution Area (SWUCA), additional conservation measures could likely further decrease potable demand. Previous conservation efforts by the City have decreased the per capita demand factor from 135 in 1996 to 122 in 2005. These values do not include losses accrued in the ASR system, in which water is treated and injected and is not fully recovered.

The P*otable Water and Sanitary Sewer Section* outlines the City's existing conservation programs and practices and identifies additional future efforts and programs that the City plans to evaluate to determine their applicability and likelihood of success in decreasing the City's potable water demand. It is likely that additional demand reduction could be realized through conservation, though any additional conservation efforts should focus first on education and outreach to increase public awareness. Future conservation efforts will consider additional water conservation measures in an attempt to further reduce their per capita water demand and peaks in demand.

Levels of service (LOS) standards are needed to determine capacity needs necessary to meet existing and future development. This Comprehensive Plan update evaluated historical data to determine average per capita factors needed to update the City's LOS value. One of the City's policies as a result of this Comprehensive Plan update will be to modify the City's LOS standard ordinance from which to base future development decisions. The City will then plan for facility expansions to meet the projected future build-out conditions.

State legislation mandates local governments ensure that public utilities, as well as other facilities and services such as roadways and drainage, are available at the time of new development. A

concurrency management system, outlined in Chapter 16 of the City Code of Ordinances, ensures that the impact of new development will not reduce the City's utility services to below the established levels of service. The *Potable Water & Sanitary Sewer* concludes with the 10 year plan which addresses future needs necessary to meet the established level of service standards.

The purpose of the *Solid Waste Section* is to ensure that necessary sanitation facilities and services are in place to provide for the needs of current and future populations in the City of Punta Gorda. The *Solid Waste Section* also details the City's curbside collection and disposal processes services for solid waste, recyclables, yard waste and hazardous waste. The City utilizes the Zemel Road Landfill which is the only solid waste operational landfill in Charlotte County.

The majority of the facilities at the landfill were constructed or upgraded within the last ten years. Therefore no major capital expenditures are anticipated in the next planning period. Furthermore projections indicate that the landfill has sufficient capacity to dispose of solid waste until 2023.

Although the landfill and solid waste collection is sufficient to serve the City of Punta Gorda's needs for the next fifteen (15) years, the issue of landfill site expansion is of importance. Through the Conservation and Recreation Lands (CARL) program, the State and County have acquired significant portions of the lands which adjoin the landfill making the facility landlocked. Charlotte County has plans to continue operating a landfill in South County past the year 2026 through the expansion of the current cell structure into the remaining permitted acreage. Future disposal needs beyond this capacity requires investigating and acquiring additional land by 2035.

The purpose of the *Stormwater Management Section* guides the City's existing stormwater management programs and provides a framework for future programs with minimal boundary changes since the time of Plan adoption; the City of Punta Gorda encompasses approximately twenty-three (23) square miles including open water uplands and urbanized development along the shorelines of the Peace River and Charlotte Harbor.

The Environmental Protection Agency (EPA) regulates stormwater pursuant to the Clean Water Act (CWA) in an effort to maintain waterways in their "fishable" and "swimmable" conditions. Other state and local regulations are in place regulate surface water management systems and alterations to existing surface water management systems which will have a significant impact on the water resources within a defined water management district, including wetlands and other natural resources. With the City's location to Charlotte Harbor and its' dependency on the water related activities, stormwater management is crucial to maintain the health and viability of the harbor's estuary.

The *Stormwater Management Section* identifies operating responsibilities of stormwater management facilities, geographic service areas, predominant types of land uses, the design capacity of the stormwater management facilities, current demand, and the level of service provided by the facilities.

The development of stormwater management facilities in the City is relatively difficult and expensive due to the City's low elevation, engineering and real estate constraints. The designing and building of such facilities are generally contracted out to private engineering and construction firms. The primary concerns relating to stormwater management facilities mainly relate to capacity and design life.

The quality of discharge needs to be consistent with the recommendations being developed by the Charlotte Harbor National Estuary Program (CHNEP) and the requirements of State Water Policy. Establishment of level of service standards for the quality and quantity of discharge must account for various storm events and acceptable levels of flooding. Level of service criteria for storm water quality should at a minimum maintain water quality consistent with the final pollutant load reduction goals established by the local State and Federal water quality programs. Pollutant load reduction goals will be implemented according to a schedule provided in the Southwest Florida Water Management District's Water Management Plan. These levels of service standards were based on providing varying degrees of flood protection based on the nature of the facility and the acceptability for potential flooding.

The residents and businesses of the City of Punta Gorda participate in the National Flood Insurance Program (NFIP). The NFIP is a federal program enabling property owners in participating communities to purchase insurance as protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. The Special Flood Hazard Area (SFHA), also known as the 100 year floodplain, and floodplain management are discussed in association with insurance rates, the NFIP, Community Rating System. Floodplain management is the operation of a community program of corrective and preventative measures for reducing flood damage. These measures take a variety of forms and generally include requirements for zoning, subdivision or building, and special-purpose floodplain ordinances.

The City is rated by the NFIP under the Community Rating System (CRS). The Community Rating System encourages and rewards community efforts aimed at reducing flood losses and promoting the awareness of flood insurance.

A major benefit to residents of CRS rated communities is that they may receive flood insurance premium rate credits which lowers insurance costs. FEMA rates each community on a scale from one to ten with one being the best obtainable rating. The City of Punta Gorda has a class rating of Class 6. This classification results in a 20% reduction in residents' flood insurance rates.

Challenges for the City are associated with the impact of development on the stormwater management system and the future annexation of vacant lands. The development review process, permit issuance, and level of service standards assist the City in offsetting the impact of development on the stormwater management system. The City of Punta Gorda will continue to employ those goals, objectives, and policies set forth in this element for the implementation of a comprehensive management plan.

II. INTRODUCTION – POTABLE WATER AND SANITARY SEWER

The Potable Water and Sanitary Sewer Section is an important component of the *Infrastructure Element*. It is necessary to support development throughout the next planning horizon. This section will identify those operations available to provide the utilities for future development and will identify a five (5) and ten (10) year planning period with additional out years included.

Purpose:

The purpose of the *Infrastructure Element* is to identify the facilities necessary to provide for public facilities and services correlated to future land use projections. The element is divided into three sections: potable water & sanitary sewer, solid waste, and stormwater management. There are no aquifer recharge areas within City limits; therefore, this component is not a part of the City's Infrastructure Element.

Relationship to the City's Comprehensive Plan

The City utilizes the availability of infrastructure as a tool for determining where and when growth can occur.

- The Future Land Use Element designates the locations and intensities of development throughout the City, which is used to prioritize utility expansion based on existing levels of development, growth patterns, and existence of infrastructure.
- The Capital Improvements Element lists funding that assures that the necessary potable water and sewer services will be in place to serve development. These expansions are generally phased in planning periods of five to ten years.
- The Intergovernmental Coordination Element identifies the numerous relationships between other agencies of the State of Florida that will affect potable water and sanitary sewer.

III. LEGISLATION – PORTABLE WATER AND SANITARY SEWER

The City must construct and operate potable water and sanitary sewer facilities in accordance with all applicable federal, state, and local regulations. Most existing regulations are based on federal guidelines mandated by the United States Environmental Protection Agency (EPA). This section addresses the data and analysis requirements pursuant to 9J5.005(2) and Florida Administrative Code (FAC). In addition, this section documents changes from the 2005 Florida Legislature, which enacted landmark growth management legislation that will impact the quality of life in Florida for years to come.

Federal Regulations

Public Law 92-500: "Water Pollution Control Act Amendments of 1972"

The federal regulations governing wastewater treatment are set forth under Public Law 92-500 or the "Water Pollution Control Act Amendments of 1972." This law requires that wastewater

treatment programs be established to regulate water-quality limits for effluent disposal and to control "point source" pollution. These provisions have been implemented at the state level under Chapter 403.086, Florida Statutes, and Chapter 62-600, Florida Administrative Code. Separate standards for on site sewage treatment and disposal systems are established in Chapter 64E-6, Florida Administrative Code.

Public Law 104-182: "Safe Water Drinking Act Amendments of 1996"

Minimum drinking water standards are defined under Public Law 104-182. Known as the "Safe Water Drinking Act Amendments of 1996", the law establishes federal water-quality standards for the protection of water for public uses, including operational government's comprehensive plans. Under the new legislation, local governments subject to a regional water supply plan must identify alternative water supply projects necessary to meet existing and future development needs.

There were five water supply requirements adopted last year that affect local government comprehensive planning programs. These requirements relate to water supply concurrency, ensuring intergovernmental coordination with regional water supply authorities, ensuring that the local government's future land use plan (*Future Land Use Element* and future land use map) is based upon the availability of adequate water supplies, and the inclusion of selected alternative water supply projects in the local comprehensive plan. Future comprehensive plan evaluation and appraisal reports will be required to include a review of progress made in implementing the alternative water supply projects selected by the local government.

Chapter 403.850

In order to comply with the federal regulations for water quality, the State of Florida has adopted legislation pursuant to Chapter 403.850, Florida Statutes. The "Florida Safe Drinking Water Act" sets forth the same primary and secondary water quality standards required for public health and recommended for aesthetic quality as the federal legislation. The State of Florida has also implemented specific laws for classifying and regulating public drinking water systems under Chapters 62-550, 62-555, 62-699, and 64E-8 of the Florida Administrative Code.

Chapter 153 Section 125.01(5)

The Charlotte County Regional Wastewater Authority (The Charlotte County Board of County Commissioners) was established pursuant to Section 125.01(5), F.S., and Chapter 153, F.S., for the purpose of providing waste and sewage collection and disposal to all of Charlotte County.

Local Regulations

The City of Punta Gorda has adopted ordinances to provide regulation for definition of service areas, rates and fees, water emergencies, and water conservation. Ordinances relating to the City water and sewer utilities are included in Chapter 17 of the City Code of Ordinances. These ordinances regulate connection to and rates for water service, use of and rates for sewer service, water emergencies, and water conservation.

City Ordinance 1363-03

Adopted on December 3, 2003 created an area outside of the corporate limits of the City of Punta Gorda in which the City is the sole provider of water and sewer utility services. This ordinance creates the boundary for the City's utility service area, which includes the City of Punta Gorda and some areas of unincorporated Charlotte County. The City's water and sewer utility service area and City Limits are shown on Map 3.1.

Map 3.1- City of Punta Gorda Utility Service Area and City Limits

IV. DATA AND ANALYSIS – POTABLE WATER

The City provides potable water to approximately 33,700 residents within the City's utility service area as shown on Map 3.1. Water is withdrawn from Shell Creek Reservoir and is treated at the Shell Creek Water Treatment Plant (WTP), which is located east of Interstate-75 on Washington Loop Road. The City's water use permit (Permit No. 20000871.008) issued by the Southwest Florida Water Management District (SWFWMD) allows average day and maximum month withdrawals, defined as the average daily withdrawal for the 30-day period of highest withdrawals, of 8.088 and 11.728 million gallons per day (mgd), respectively. The existing water use permit was issued on July 31, 2007 and expires on July 31, 2027.

The City's WTP is permitted by Florida Department of Environmental Protection (FDEP) for 10 mgd of treatment capacity. After treatment, water is pumped from the WTP to the distribution system for delivery to customers. The distribution system contains two storage facilities, Burnt Store Tank and Bal Harbor Tank and Pump Station, which provide storage to meet peak demands and for fire protection.

Potable Water Planning Studies and Efforts

The City continually initiates planning studies to assist in developing the most reliable, cost-effective strategy for supplying potable water to its customers. Since its conception in 1965, the City's water utility has taken a proactive approach to water supply planning, design, and construction. The City's most recent efforts for water supply planning are described below.

Water Supply Master Plan (WSMP),

In October 2006, the City completed a Water Supply Master Plan (WSMP), which addressed the potable water needs of the City through the year 2050. The WSMP met the following objectives:

- Compiled water demand projections through 2050
- Investigated and defined a proactive strategy for influencing the development of minimum flows and levels (MFL) in the Shell Creek
- Identified the evaluation criteria for preliminary assessment of potential water supply projects and screened potential projects according to those criteria
- Investigated the feasibility, advantages, and disadvantages of the most promising water supply projects based on sustainability, capital and lifecycle costs, and potential capacity
- Provided planning scenarios for the City to meet the projected future water demands through 2050, while considering both self-sufficient supply and regional issues
- Prepared and submitted the City's water use permit renewal application

The City will be completing an update to the WSMP in 2008 to address changes in regional water supply issues, grant funding opportunities, and proposed MFL regulations. Because circumstances surrounding water supply are continually changing, the City will continue to update the WSMP in the future

to maintain the most cost effective and reliable approach for the City's water supply.

Water System Master Plan

The City is also working with an engineering consultant to complete a Water System Master Plan and hydraulic water system model. This project was completed in August 2008. The primary goal of the project was to provide hydraulic modeling analyses to determine pipeline infrastructure requirements for existing areas without water service and to serve new development. The Water System Master Plan also documents existing conditions in the distribution system and makes recommendations to improve system efficiency and eliminate hydraulic bottlenecks.

Reuse Feasibility Study

Studies, programs, and efforts for additional conservation of water are on-going, as discussed in conservation practices and regulation section. In addition to the conservation programs listed in that section, the City is completing a Reuse Feasibility Study to investigate the feasibility of implementing a reuse system to treat and deliver reuse water for beneficial use as landscape irrigation water. A reuse water system would help to optimize the management of water resources by offsetting a portion of potable water use, which would reduce demand on the region's potable water supply.

The City's master planning efforts for both water supply and water distribution system infrastructure will allow the City to coordinate, plan, and meet the needs of new development in an effective manner.

Potable Water Inventory - Treatment, Storage, and Distribution

Water demand in the City's service area is met through the City's Shell Creek surface WTP and some private groundwater supplies. Although the private groundwater wells are within the City's water utility service area, the City does not have responsibility for these facilities, as they are under the jurisdiction of Charlotte County. The major uses of potable water within the City's water service area are residential potable supply; urban irrigation; various commercial uses such as restaurants, hotels, and businesses; and institutional uses such as the County schools and jail. Industrial uses are minimal in the City's service area. Based on the City's 2006 Water Audit completed as part of the SWFWMD water use permit conditions, the 2006 total water use was:

- 72.1% residential
- 15.0% commercial/industrial/institutional
- 3.4% recreation/aesthetic
- 6.5% other uses
- 3.2% unaccounted-for water

Shell Creek Reservoir, an in-stream impoundment created by the construction of Hendrickson Dam in 1965, provides the City's potable water supply. Shell Creek Reservoir receives water from Shell, Prairie, and Joshua Creeks. The Shell Creek system is included as a regional source in the 2006 SWFWMD Regional

Water Supply Plan with sufficient quantities to meet the City's 20-year water needs. The in-stream reservoir provides the City with water supply for treatment at the Shell Creek WTP. The existing dam is reaching the end of its 40-year useful life. Therefore, the City plans to complete improvements to the dam between 2008 and 2010 to ensure continued reliable operation and safety, as outlined in the *Capital Improvements Element*.

The Shell Creek WTP is a surface water plant that utilizes the following treatment processes: stripping, flash mix with alum coagulation, flocculation, sedimentation, filtration, chlorine disinfection, and finished water storage. The original WTP was built in the late 1960s and has been upgraded numerous times. It is in good condition, comparable to facilities of similar age. The facility is currently under construction for various improvements to the filters and chemical feed systems.

The WTP site also contains two aquifer storage and recovery (ASR) wells that can be used to provide additional water supply. The City uses its ASR wells to supplement water supply during times of low or no flow in Shell Creek, as well as to improve treated water quality during times of poor water quality conditions in Shell Creek Reservoir. The ASR wells are permitted to inject water into the aquifer storage zone at a rate of 1.4 mgd per well and recover water at a rate of 1 mgd per well. Therefore, the City's available supply from the ASR wells is approximately 2 mgd when operating both wells at their permitted capacity. This quantity is not sufficient to meet the entire demand of the City; therefore, the City uses recovered ASR water to supplement water from the reservoir. Map 3.2 illustrates the location of the WTP and ASR wells relative to the raw water source. Although the ASR wells provide an additional source during times of low flow in Shell Creek and help increase the water system reliability, all of the water injected into the ASR wells cannot be recovered. ASR wells can typically recover 60 to 80 percent of treated water that is injected, depending on water quality considerations and which aquifer zone is used for storage.

Finished water stored at the WTP is distributed to the system by two transmission mains from the WTP. Map 3.3 illustrates the City's existing water distribution system infrastructure and locates the remote finished water storage facilities. The current storage capacity of the water system consists of 3.86 million gallons (MG) of ground storage at the WTP, 1 MG elevated storage tank located on Burnt Store Road, and 2 MG ground storage tank and booster pump station located at the intersection of Aqui Esta Drive and Bal Harbor Boulevard. Storage is provided for equalization, fire flow requirements, and emergencies. The need for additional distribution system storage capacity will be evaluated as part of the on-going Water System Master Plan.

Map 3.2 - Aerial Map of Water Treatment Plant, ASR Wells, and Shell Creek Reservoir

Map 3.3 - City of Punta Gorda Water System Infrastructure

Conservation Practices and Regulations

The City considers conservation a beneficial method to reduce total water demand. Although the City currently meets the water demand goal of the Southern Water Use Caution Area (SWUCA) of 150 gallons per capita per day (gpcd), additional conservation measures could likely further decrease potable demand. Previous conservation efforts by the City have decreased the per capita demand factor from one hundred and thirty-five (135) in 1996 to one hundred and twenty-two (122) in 2005. It should be noted that these values do not include losses accrued in the ASR system, in which water is treated and injected and is not fully recovered.

Although the City is pleased with its water conservation efforts and decrease in per capita water demand over the past ten (10) years, the City is committed to further reduce individual levels of consumption. The following sections outline the City's existing conservation programs and practices and identify additional future efforts and programs that the City plans to evaluate to determine their applicability and likelihood of success in decreasing the City's potable water demand. It is likely that additional demand reduction could be realized through conservation, though any additional conservation efforts should focus first on education and outreach to increase public awareness.

Existing City Conservation Programs

Tiered Water Rate Structure

The City uses moderately tiered water rates based on consumption. The billing structure is comprised of three components:

- A monthly base facility charge based on the number of equivalent residential units (ERUs) served
- A monthly charge by meter size
- A water usage charge based on gallons of water used

The water usage charge is based on an inverted tiered rate structure that encourages customers to use less water. "Inverted block rates," such as those used by the City, are generally an attempt to recognize the added cost of producing water during the peak watering season, which drives up facility sizing and costs. In addition, City residents pay a different rate than customers outside of City limits. A summary of the City's current water billing structure is provided in Table 3.1.

Table 3.1 - Water Billing Structure

Monthly Base Facility Charge per ERU		
Customer	Inside City Limits	Outside City Limits
All Classes	$5.87 per ERU	$7.33 per ERU
Monthly Charge by Meter Size		
Meter Size	Inside City Limits	Outside City Limits
3/4"	$5.78	$7.22
1"	$8.55	$10.68
1-1/2"	$13.85	$17.31
2"	$24.44	$30.55
3"	$60.94	$76.17
4"	$94.10	$117.62
6"	$201.23	$251.53
8"	$290.71	$363.28
Monthly Water Usage Charge		
Gallons Used	Inside City Limits Cost per 1,000 Gallons	Outside City Limits Cost per 1,000 Gallons
1,000 - 10,000	$2.72	$3.40
10,000 - 20,000	$3.13	$3.91
20,000 - 40,000	$3.52	$4.40
40,000 - 80,000	$3.93	$4.91
Over 80,000	**$4.34**	$5.42

Source: Carollo Engineers 2007

City Ordinances

The City has instituted several water conservation ordinances including the following:

- Installation of required fixtures and equipment as a precondition to water service, all new fixtures must comply with Building Codes.
- Replacement of certain existing fixtures.
- Watering restrictions that allow lawn irrigation two days per week. During times of low or zero flow in Shell Creek, the City Council may reduce lawn irrigation to once per week.
- Application of municipal infraction penalties for violating the City's watering restrictions.
- Per City Land Development Regulation Chapter 26, allows for xeriscape landscaping for the reduction of irrigation usage

Rebates and Retrofits

The City offers rebates for new rain sensors for irrigation rain shut-off devices installed prior to 1991. This project was initiated in cooperation with the SWFWMD Peace River Basin Board, the City's local basin board that guides and directs local water programs, and the City has continued to fund the program.

Future Conservation Efforts

The City is considering additional water conservation measures in an attempt to further reduce their per capita water demand and peaks in demand. Potential conservation measures could include a more aggressive rate structure, public education and outreach

to counsel on the importance of conservation, implementing ordinances requiring water conserving architecture and landscaping, additional plumbing and fixture rebates and retrofits, and special educational programs for high water use customers. Some of the City's ideas for programs and initiatives are discussed further below. The City plans to evaluate these programs for their possible effectiveness and may implement them in the future.

Education and Outreach Programs

The City plans to include an article regarding the benefits and importance of conservation in their utility newsletter, which is distributed to all utility customers on a regular basis. This would be an on-going program in which the City will highlight various aspects of conservation and its advantages to the community. The City also plans to include information regarding conservation in their annual consumer confidence report (CCR). The CCR is sent to all customers summarizing the City's water sources, water quality, and other educational information regarding the City's water supply.

'Green' Architecture/Florida-Friendly Landscaping

The City will evaluate language in their land development regulations that discourages water conservation. The City development and planning departments plan to discuss the benefits of conservation-oriented landscaping and architecture.

V. LEVEL OF SERVICE STANDARDS – PORTABLE WATER

Potable water levels of service (LOS) standards are implemented to plan for and monitor water treatment plant conditions and capacity, as well as to ensure water quality regulatory requirements are met. Chapter 16 in the City Code of Ordinances documents the City's existing LOS standards. This ordinance states that the City shall provide 85 gallons per day (gpd) of capacity for residential uses as a minimum LOS; however, the City historically has used a value of 220 gpd per ERU for general water system planning purposes. In this Comprehensive Plan update, historical data was evaluated to determine actual per capita water demands and peaking factors. These values were then used to update the City's LOS value to be based on actual historical data to be used for future planning. One of the City's policies as a result of this Comprehensive Plan update will be to modify the City's LOS standard ordinance from which to base future development decisions.

Potable water demands are expressed in terms of both average daily demands for purposes of meeting level of service requirements. The City's water system must be able to meet average daily demands on a regular basis without stressing the WTP or distribution system. The City must also be able to treat and deliver water during occasional periods of peak demand without exceeding water infrastructure capacities. Peak demands are met by a combination of treatment plant capacity, as well as distribution system storage and pumping facilities to meet diurnal fluctuations during the day of peak demand.

In order to determine the necessary LOS standards for the City's water system, the historical average per capita water use rate in the City was determined. Based on analyses completed during the 2006 Water Supply Master Plan, the average per capita water demand during the past 10 years, including losses accrued during water treatment, the ASR system, and in the distribution system, was 141 gpcd. The current average persons per household in the Punta Gorda utility service area is 2.035 based on 2000 Census data. Based on this value, the current annual average demand in the City's service area is 287 gpd per ERU.

In addition, a LOS standard for water transmission capabilities shall be set to maintain at least 40 pounds per square inch (psi) of pressure in the system at peak hour conditions. This criterion will be used in the on-going Water System Master Plan when evaluating the existing system and sizing future pipeline infrastructure.

Potable Water Demand Projections

City and County zoning guidelines classify the utility service area land use. The land use in the City's utility service area is primarily residential, including high-density areas such as mobile home parks and condominiums, medium-density areas, and low-density rural residential areas. The service area also includes light commercial and industrial areas, a small airport, and institutional uses such as parks, schools, hospital, and the Charlotte County Jail.

The Water System Master Plan land use based approach for population and demand projections represents the most comprehensive effort and evaluation of the City's projected future demands based on historical water demands and land use. The rate of demand growth is approximately 2.7 percent per year, which is consistent with previous planning efforts. A summary of previous methods to project water demand is described below.

During the City's 2006 Water Supply Master Plan project, several methodologies were used to estimate the City's water demands through build-out. The methodologies utilized were based on historical water production, population growth, and per capita water usage. It was determined during the City's Water Supply Master Plan that it is not feasible to utilize common published population projections such as those from the Bureau of Economic and Business Research (BEBR) for water demand projections for the City. BEBR develops population projections for counties only, making extrapolation of the City population difficult. In addition, the City provides potable water service not only to customers within City limits, but also numerous customers within unincorporated areas of Charlotte County. For example, the current estimated 2008 population of the City is approximately 17,650, while the estimated population of the service area is approximately 33,700. The City's utility service area population is approximately twice that of the City population. This trend is expected to continue in the future, although the ratio of City population to utility service area population is expected to decrease slightly over time due to available locations for future growth.

Based on these population projection limitations, historical water account growth and per capita water usage were more appropriate approaches to developing water demand projections. Therefore, information on the City's existing water meters and

accounts was utilized in the SWFWMD methodology for estimating population, which accounts for transient population including seasonal, tourist, and commuter populations. This methodology brings uniformity to population estimation by various utilities and enables utilities to estimate seasonal population and demands associated with that population more accurately. The population projection developed using the SWFWMD methodology were then multiplied by the average historical per capita water use rate and projected forward to determine future water demand projections based on the City's historical growth rate in the service area (average of 2.7 percent). The historical per capita water use rate used for average daily demand projections for water supply purposes is 141 gpcd based on water withdrawals from the past 10 years. The per capita value of 141 also includes losses from the ASR wells due to water that is injected into the wells but not recovered. These projections correlate well with the land use based approach utilized in the Water System Master Plan.

The population projection and annual average water demand projection resulting from this analysis is provided in Table 3.2.

Table 3.2 - Population and Annual Average Water Demand Projections

Year	Estimated Functional Population of Service Area1	Per Capita Demand Factor (gpcd)	Average Daily Demand (mgd)
2008	33,700	141	4.75
2013	38,900	141	5.48
20182	47,900	141	6.75
20232	56,900	141	8.03
Build-out (2027-2035)	64,200	141	9.05

Notes: Estimated functional population of service area was developed using SWFWMD's methodology of developing population for water demand projection purposes and includes customers within City limits and some portions of unincorporated Charlotte County.
Flow projections for 2018 and 2023 were extrapolated from flows calculated during the Water System Master Plan.

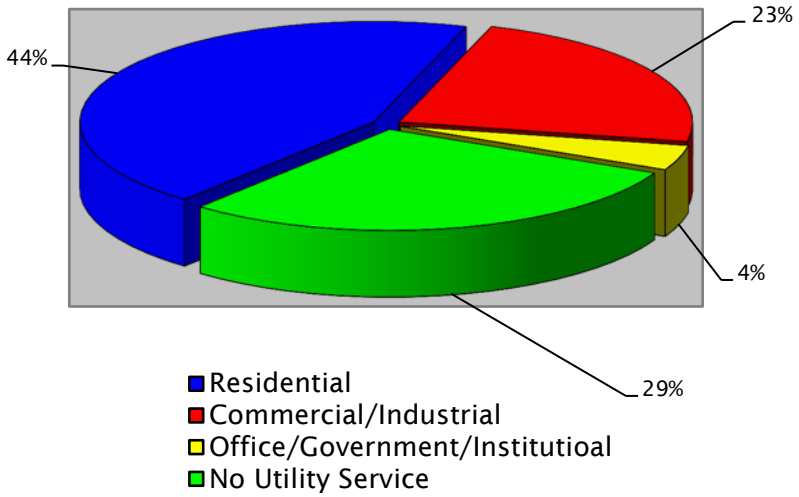
During these studies, it was determined that the City's utility service area land use is approximately (Chart 3.1):

- 43.6% residential
- 23.3% commercial/industrial
- 3.8% office/government/institutional
- 29.3% with no utility service (environmental lands, lakes, ponds, airport runways, etc.)

A relatively large percentage of area yet to be developed is designated for commercial and industrial uses and located

outside of the City limits within unincorporated Charlotte County. Chart 3.1 illustrates the existing distribution of land use in the City's utility service area.

Chart 3.1 - City of Punta Gorda Utility Service Area Land Use



Source: Carollo Engineers 2007

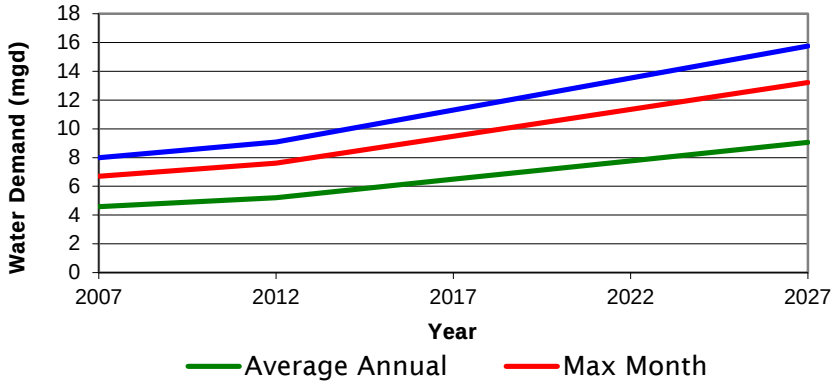
Water demand projections through build-out (approximately 2027 to 2035) are summarized in Table 3.2. These projections were developed during the City's Water System Master Plan project and were calculated based on land use designations, historical water demands, and peaking factors. Based on evaluations completed during the Water System Master Plan, a build-out population of approximately 59,000 can reside on land within the existing utility service area, which is expected to occur between 2027 and 2035. Table 3.3 projects the average daily, maximum month and peak day water demands by 5 year increments and projects the demand at build-out to be 9.05, 13.21, and 15.75 mgd, respectively. Water demand projections are presented graphically in Chart 3.2.

Table 3.3 - Water Demand Projections

Year	Average Daily (mgd)	Maximum Month[2] (mgd)	Peak Day (mgd)
2008	4.75	6.88	8.22
2013	5.48	7.99	9.52
2018	6.75	9.85	11.75
2031	8.03	11.72	13.97
Build-out (2027-2035)	9.05	13.21	15.75

Notes:Flow projections for 2018 and 2023 were extrapolated from flows calculated during the Water System Master Plan.
The average daily demand for the 30-day period of highest demands.
Source: Carollo Engineers 2007

Chart 3.2 - Water Demand Projections



Source: Carollo Engineers 2007

Future Potable Water System Expansions

The City will continue to utilize its existing water supply source, Shell Creek, to meet future potable water demands. The SWFWMD 2006 Regional Water Supply Plan (RWSP) was developed by the SWFWMD to assess projected water demand within its jurisdiction and potential sources of water to meet those demands through the 20-year period. The RWSP provides a framework for future water management decisions and identifies potential options and associated costs for developing those supplies. Based on the RWSP, available flow in Shell Creek is approximately 17 mgd in addition to the City's existing withdrawals. The City has obtained a water use permit from SWFWMD to meet its 20-year raw water demand projections from Shell Creek.

The existing WTP is permitted for 10 mgd, which will satisfy the projected peak day demand of the City through 2013. At that time, a facility expansion to 16 mgd peak flow is planned to come online. The WTP expansion design and permitting activities are scheduled to begin in 2008, as shown in the *Capital Improvements Element*. In addition to the WTP expansion, the City also plans to construct an off-stream reservoir on City property directly to the east of the WTP. The off-stream reservoir will allow the City to store water from Shell Creek during times of high flow, typically from June through October. The City would then withdraw raw water from the off-stream reservoir to meet demands during times of low flow or when Shell Creek has poor water quality. The City will also continue to maintain and expand its water distribution system infrastructure, mainly transmission pipelines, as needed to meet future development needs, replace aging infrastructure, and increase reliability through looping and increased diameter pipelines for additional capacity.

To increase the reliability of its water supply, the City is partnering with Charlotte County and the Peace River/Manasota Regional Water Supply Authority (Authority) to create a "regional loop" between individual water utility facilities in Charlotte, Manatee, Desoto, and Sarasota Counties. The Authority is an independent special district and a regional water supply authority under the laws of the State of Florida. The Authority's chief purpose is to provide water supply to the region and to develop, recover, and supply water sources for municipalities and counties in a manner that will encourage water conservation and minimize adverse environmental impacts. Several regional loop

transmission pipelines are currently in preliminary design phases under coordination by the Authority and the local utilities. These projects are being developed and managed under the direction of the Authority and SWFWMD.

Summary of Water Demands, Facility Capacity, and Permits

Table 3.4 provides a summary of the City's existing and projected water demands, water treatment facility capacity, and permit conditions. As shown, the City has sufficient permitted raw water supply to meet the 10-year water demand projections. As discussed previously, the City plans to expand their WTP to 16 mgd to meet the projected future peak day demand of 15.75 mgd at build-out of the City's utility service area between 2027 and 2035. The expansion is planned to come online by 2014 when the peak day demand is expected to exceed the existing WTP capacity. This expansion was approved by the City Council after the City's 2006 Water Supply Master Plan and is included in the *Capital Improvements Element* of the Comprehensive Plan.

Table 3.4 - Summary of Water Demands, Facility Capacity, and Permits

Year	2008	2013	2018
Average Daily Demand (mgd)	4.75	5.48	6.75
Annual Average Permitted Quantity (mgd)	8.088	8.088	8.088
Annual Average Permitted Surplus (mgd)	3.338	2.608	1.338
Peak Day Demand (mgd)	8.22	9.52	11.75
Available WTP Capacity (mgd)	10.00	10.00	16.001
Facility Capacity Surplus (mgd)	1.78	0.48	4.25

Notes: 1. The City WTP will be expanded from 10 to 16 mgd by 2014.
Source: Carollo Engineers 2007

Concurrency Management

Local governments must ensure that public utilities, as well as other facilities and services such as roadways and drainage, are available at the time of new development. A concurrency management system ensures that the impact of new development will not reduce the City's utility services to below the established levels of service. The City's concurrency management procedures are outlined in Chapter 16 of the City Code of Ordinances.

The City utilizes an established procedure to approve new water service connections in the City's utility service area. To request water and wastewater service, a developer must complete a Request for Utility Availability Form with the City. In addition, the City completes a concurrency review at the time of a developer proposal. The zoning official will review the request and the City utilities staff will evaluate the capacity and location of the proposed utility service request and its potential impacts on existing infrastructure such as pipelines, storage tanks, and pump station capacity. The projected impact of the project will be calculated and the LOS criteria shall be used to determine whether or not sufficient facilities capacity exists. The City then contacts the applicant to discuss the available utility services. If no water utility service exists in the area of new development, or

if the proposed development will decrease the level of service to below the adopted standard, the City will discuss options for line extension and other improvements that may be necessary to meet the established level of service standards.

VI. 10-YEAR WORK PLAN –POTABLE WATER

The City Council adopted the Water Supply Master Plan in 2006, which provided a framework of future water supply projects to continue to meet the City's projected water demands. The City will complete an update to its Water Supply Master Plan a minimum of every 5 years.

The City will continue to put conservation programs and initiatives into practice. In addition, progress towards the City's reuse goal by 2017 is anticipated in the 10-year time period. However, because the City has already made significant progress in decreasing its potable demand and because it is unknown how much additional demand reduction can be met by conservation, the City is not depending on conservation or reuse to meet its future demand projections for purposes of the Comprehensive Plan. The feasibility of a reuse program will be unknown until the completion of the Inflow and Infiltration Study in 2008.

The City's future potable demand increases will be met using raw surface water from Shell Creek. This source will qualify as an alternative water supply project upon the completion of the off-stream reservoir in 2014. The 10-year demand projections estimate that an annual average quantity of 6.75 mgd will be needed from Shell Creek by 2018.

The City will need to expand its WTP and construct an off-stream raw water storage reservoir by 2014 to meet its projected water demands. The WTP expansion and reservoir projects require significant planning, permitting, and design activities prior to construction. A summary of the tasks required and anticipated funding sources for this project is provided in Table 3.5.

Table 3.5 - Potable Water 10-Year Work Plan

Fiscal Year	Project	Task	Funding Source
FY08	WTP Expansion & Reservoir	Preliminary Design	Rates & Impact Fees
FY09	WTP Expansion & Reservoir	Design & Permitting	Rates & Impact Fees
FY10	WTP Expansion & Reservoir	Construction	Rates & Impact Fees
FY11	WTP Expansion & Reservoir	Construction	Rates & Impact Fees
FY12	WTP Expansion & Reservoir	Construction	Rates & Impact Fees
FY13	WTP Expansion & Reservoir	Final Completion and Start-Up	Rates & Impact Fees

FY14 - FY17: No significant potable water supply projects planned.
Source: Carollo Engineers 2007

In addition to the WTP expansion and off-stream reservoir, the City will be completing various other small projects in the water system for continued operability and reliability and to serve new development areas. These include water main improvements, utility relocation projects for widening of streets, dam improvements, and backup power generator equipment at the Bal Harbor Booster Station. Construction dates, cost estimates, and funding sources for these projects are provided in the Capital Improvements Element.

The City is currently developing a Water System Master Plan, which will further refine the City's necessary capital improvements to meet future water service needs. The Water System Master Plan was completed and adopted in August 2008.

VII. DATA AND ANALYSIS - SANITARY SEWER

The City provides wastewater service to approximately 25,450 residents within the City's utility service area. Map 3.6 illustrates the City's utility service area and existing wastewater collection system infrastructure. Currently, the City provides sanitary sewer service to only a portion of the utility service area. Many low-density areas and some mobile home parks and medium-density areas utilize septic or onsite treatment systems. The City has plans to convert some of these areas to community sanitary sewer systems within the 5- to 10-year planning period.

Wastewater is collected via relatively small diameter gravity mains and is transported by gravity flow to approximately 139 City and privately owned lift stations in the collection system. The flow is then pumped to the Master Pumping Facility on Henry Street and Booster Pumping Facility near the Charlotte County Airport, which are large ground storage tank and pumping facilities in the collection system. The flow is then pumped from the Booster Pumping Facility to the wastewater treatment plant (WWTP) on Bermont Road for treatment and disposal.

Sanitary Sewer Planning Studies and Efforts

The City has completed various planning studies to assist in developing a reliable, cost-effective strategy for collecting and treating wastewater. The City continues to conduct system evaluations and planning studies to identify and remediate deficiencies in the existing system and to prepare for future development. The City's most recent efforts for sanitary sewer system evaluation and planning are described below.

Reuse Feasibility Study

In January 2007, the City initiated a Reuse Feasibility Study to investigate the technical and financial elements of a reclaimed water system. The City has investigated the potential for a reuse system in the past; however, a reuse system was not considered feasible due to cost, water quality constraints, and limited demand for reuse water. Therefore, an updated Reuse Feasibility Study was developed to address the feasibility of implementing a reuse system to treat and deliver reuse water for beneficial use as landscape irrigation water.

Map 3.4 - City of Punta Gorda Wastewater System Infrastructure

A reuse water system would help to optimize the management of water resources by offsetting a portion of potable water use, which would reduce demand on the region's potable water supply. The Reuse Feasibility Study was completed in January 2008. Results of the study suggest that reuse is not feasible at this time due to elevated chloride concentrations in the wastewater that make reuse unsuitable for landscape irrigation.

Inflow and Infiltration Study

In 2008, the City plans to initiate an Inflow and Infiltration Study to investigate the sources and causes of elevated levels of chloride in its wastewater, which is suspected to be caused by infiltration of brackish groundwater into gravity wastewater collection laterals. The Inflow and Infiltration Study will also identify areas of the collection system that are prone to inflow, which increases hydraulic loading at lift stations, master pumping facilities, and WWTP. Funds for inflow and infiltration repairs have been allocated in the City's Capital Improvements Plan, as discussed in the *Capital Improvements Element* of this Comprehensive Plan.

Wastewater Collection System Master Plan

The City is working with an engineering consultant to complete an on-going Wastewater Collection System Master Plan and hydraulic wastewater forcemain system model. This project was completed in August 2008. The primary goal of this project is to provide hydraulic modeling analyses to determine future wastewater collection infrastructure requirements for existing areas without sanitary sewer service that will be converted to the community system and to evaluate infrastructure requirements to serve new developments. The Wastewater Collection System Master Plan will also document existing conditions in the collection system and will make recommendations to improve system efficiency and to eliminate hydraulic bottlenecks.

The City's continued planning and study efforts for wastewater collection and treatment will allow the City to effectively meet the needs of the existing system and to coordinate, plan, and meet the needs of future development.

Sanitary Sewer Inventory - Wastewater Collection and Treatment

Wastewater is collected via relatively small diameter gravity mains and is transported by gravity flow to approximately 139 City and privately owned lift stations. Many of the lift stations are "gravity-lift" pumping stations and do not directly pump into force mains; instead, they pump into downstream gravity lines that transport wastewater to additional lift stations, which eventually pump the wastewater into the main force main network. Wastewater is pumped from lift stations to the Master Pumping Facility and Booster Pumping Facility, which are large, ground storage tanks and pumping facilities in the collection system. Storage is provided for flow equalization before being pumped to the WWTP. The combined storage capacity of the Master and Booster Pumping Facilities is 1.1 MG. The flow is then pumped from the Booster Pumping Facility to the WWTP for treatment and disposal.

The City's wastewater treatment and disposal facilities are located on an 860-acre tract of land located seven miles east of the City in the Cecil Webb Wildlife Management Area. The land is under a 99-year lease from the State of Florida. The City's WWTP was originally constructed in 1984 and was expanded in 1990. The WWTP is currently rated at a capacity of 4 mgd based on 3-month annual average daily flow by FDEP (Permit No. FLA118371). The existing permit expires on July 28, 2010. The plant provides secondary treatment of wastewater and aerobic digestion of waste biosolids. The treatment units at the plant include two mechanical bar screens, aerated grit removal, four aeration tanks, four clarifiers, two chlorine contact tanks, six aerobic digesters, one lined supernatant holding basin, and three lined effluent storage basins with 60 MG of total storage volume. The wastewater treatment plant and collection system infrastructure components are in fair to good condition. The facilities are in comparable condition to facilities of similar age.

Treated effluent from the WWTP was used for agricultural reuse until 2001. Effluent was used to irrigate underdrained hay fields on the WWTP site, and local farmers harvested the hay. Reuse ceased after it was discovered that runoff from the underdrains exceeded the conductivity limits in Myrtle Slough, the receiving water. As of August 2001, the City has disposed of treated effluent by injection into a Class 1 injection well (Permit No. 104020-010-UO) with a permitted capacity of 12 mgd. The injection well permit expires on November 23, 2008. Residuals are disposed of by land application on the WWTP site. The City is pursuing a renewal of this permit that will cover the next five (5) years.

The City owns and operates just one wastewater treatment facility to serve the needs of its customers as described above. However, six additional wastewater treatment facilities to serve small residential developments are located within the City's utility service area. It should be noted that the City does not have responsibility for these systems, as they are located outside City limits and within unincorporated Charlotte County. Some of these facilities may connect into the City's wastewater system within the 10-year planning horizon. Information for these facilities is listed in Table 3.6.

Table 3.6 - Private Wastewater Facilities Within the City's Utility Service Area

Facility ID	Name	Address	Capacity (gpd)	Permit Expiration Date
FLA014121	Alligator MHP	6400 Taylor Road	60,000	4/18/2011
FLA014067	Bay Palms MHP	25163 Marion Avenue	10,000	8/28/2010
FLA014070	Lazy Lagoon MHP	8320 Riverside Drive	70,000	12/9/2008
FLA014088	Palm & Pines Inc.	5400 Riverside Drive	15,000	6/30/2010
FLA014105	Pelican Harbor MHP	6720 Riverside Drive	20,000	6/23/2010
FLA014122	River Forest Village	4300 Riverside Drive	35,000	6/24/2008

Notes:
1. The City does not have responsibility for these facilities, but they are located within the City's wastewater utility service area.
2. MHP = Mobile Home Park
Source: Carollo Engineers 2007

VIII. LEVEL OF SERVICE STANDARDS – SANITARY SEWER

Sanitary sewer levels of service (LOS) standards are needed to determine transmission and WWTP capacity needed to meet existing and future development. Chapter 16 in the City Code of Ordinances documents the City's existing LOS standards. This ordinance states that the City shall provide 190 gpd of wastewater capacity for residential uses as a minimum LOS. This value has also been used historically for general wastewater system planning purposes. However, for this Comprehensive Plan update, historical data was evaluated to determine average per capita wastewater flows and peaking factors. These values were then used to update the City's LOS value to be based on actual historical data to be used for future planning. One of the City's policies as a result of this Comprehensive Plan up date will be to modify the City's LOS standard ordinance from which to base future development decisions.

Wastewater is expressed in terms of average daily and maximum month flow for purposes of meeting LOS requirements. The City's wastewater collection system and treatment plant must be able to convey and treat average daily flows on a regular basis without stressing the WWTP or collection system. The City must also be able to operate during occasional periods of peak flows without exceeding collection system infrastructure capacities. Peak flows are met by a combination of equalization storage in the collection system and WWTP capacity.

In order to determine the necessary LOS standards for the City's sanitary sewer system, the historical average per capita wastewater production rate in the City was determined. Based on analyses completed during the on-going Wastewater System Master Plan, the existing average per capita wastewater production rate is 83 gpcd. Based on the current average persons per household of 2.035, the current annual average flow is 169 gpd per ERU. Therefore, the LOS standards for the City's sanitary sewer system are 83 gpcd or 169 gpd per ERU on an average basis.

Wastewater Flow Projections

Wastewater flow projections of the utility service area through build-out (approximately 2027-2035) are summarized in Table 3.7. These projections were developed during the City's on-going Wastewater System Master Plan project and were calculated based on land use designations, historical wastewater flows, and peaking factors. Based on evaluations completed during the Wastewater System Master Plan, build-out of the City's utility service area is anticipated to be complete by approximately 2027 to 2035. At that time, it is anticipated that many of the existing septic system areas will be connected to the sanitary sewer system. With conversion of septic system areas, the average daily, maximum month, and peak day flows at build-out are projected to be 5.02, 6.98, and 14.06 mgd, respectively.

If the septic system areas are not converted to the community sanitary sewer system, the average daily, maximum month, and

peak day flows at build-out are expected to be 4.35, 6.05, and 12.18 mgd, respectively.

Table 3.7 - Wastewater Flow Projections

Year	Average Daily (mgd)	Maximum Month[3] (mgd)	Peak Day (mgd)
2008	2.18	3.03	6.11
2013	2.64	3.67	7.40
20181	3.49	4.85	9.78
20231	4.34	6.04	12.16
Biuld-out2	5.02	6.98	14.06

Notes:
1. Flow projections for 2018 and 2023 were extrapolated from flows calculated during the Wastewater System Master Plan.
2. Based on evaluations completed during the Wastewater System Master Plan, build-out of the City's utility service area is anticipated between 2027 and 2035. At that time, it is expected that a portion of existing septic system areas will be connected to the sanitary sewer system. The flow projections in this table include conversion of septic system areas. If these areas are not converted to sanitary sewer, the average daily, maximum month, and peak day flows at build-out are expected to be 4.35, 6.05, and 12.18 mgd, respectively.
3. The average daily flow for the 30-day period of highest flows.

Source: Carollo Engineers 2007

Future Sanitary Sewer System Expansions

The City's existing treatment and disposal system has sufficient capacity to accommodate existing and near-term flow projections. The existing WWTP is currently permitted for 4 mgd based on 3-month average daily flow (3MADF). 3MADF is defined as the average daily flow during the 3 consecutive months with the highest flow. Using maximum month flow as a conservative estimate of 3MADF, the City will require additional WWTP capacity by approximately 2015. Therefore, the City plans to increase the WWTP capacity to 7 mgd by 2015. This capacity will serve the City through its build-out wastewater flow projections. The City will also continue to maintain and expand its collection system infrastructure, such as lift stations and forcemains, as needed to meet future development demands.

Peak day flow is expected to exceed the 12 mgd capacity of the injection well by approximately 2025. At that time, during peak flow events, the WWTP can divert excess effluent flow to existing storage ponds, avoiding the need for increased disposal capacity. It is anticipated that some of the existing storage capacity will be converted to reuse system storage if a reuse system is implemented in the future. In that case, a portion of the existing 60 MG of pond storage will still be maintained as effluent storage during peak flow events.

Summary of Wastewater Flow Projections and Facility Capacity

Table 3.8 provides a summary of the City's existing and projected wastewater flows, WWTP capacity, and permit conditions. The City plans to expand its WWTP to 7 mgd (based on 3MADF) to meet the projected future maximum month flow of 6.98 mgd at build-out conditions. The expansion is planned to come online by 2015 when the maximum month flow is expected to exceed the existing WWTP capacity.

Table 3.8 - Summary of Wastewater Flows and Facility Capacity

Year	2008	2013	2018
Average Daily Flow (mgd)	2.18	2.64	3.49
Maximum Month1 Flow (mgd)	3.03	3.67	4.85
WWTP 3MADF Permitted Capacity (mgd)2	4.0	4.0	7.02
WWTP Permitted Surplus (mgd)3	0.97	0.33	2.15

Notes:
1. The average daily flow for the 30-day period of highest flows
2. 3MADF is defined as the average daily flow during the 3 consecutive highest flow months. Comparing maximum
3. month flow with 3MADF provides a conservative estimate of meeting permitted quantities.
4. Permitted surplus compares maximum month flow projections with the permitted 3MADF flow.
5. The City WWTP will be expanded from 4 to 7 mgd (based on 3MADF) by 2015.

Source: Carollo Engineers 2007

Concurrency Management

Local governments must ensure that public utilities, as well as other facilities and services such as roadways and drainage, are available at the time of new development. A concurrency management system ensures that the impact of new development will not reduce the City's utility services to below the established levels of service. The City's concurrency management procedures are outlined in Chapter 16 of the City Code of Ordinances.

The City utilizes an established procedure to approve new sewer service connections in the City's utility service area. To request wastewater service, a developer must complete a Request for Utility Availability Form with the City. In addition, the City completes a concurrency review at the time of a developer proposal. The zoning official will review the request and the City utilities staff will evaluate the capacity and location of the proposed utility service request and its potential impacts on existing infrastructure such as pipelines, storage tanks, and pump station capacity. The projected impact of the project will be calculated and the LOS criteria shall be used to determine whether or not sufficient facilities capacity exists. The City then contacts the applicant to discuss the available utility services. If no sewer utility service exists in the area of new development, or if the proposed development will decrease the level of service to below the adopted standard, the City will discuss options for additional pump stations, pipelines, or other improvements that may be necessary to meet the established level of service standards.

IX. 10-YEAR WORK PLAN - SANITARY SEWER

Progress towards the City's 2017 reuse goal is anticipated in the 10-year time frame. However, the feasibility of a reuse program will be unknown until the completion of the Inflow and Infiltration Study in 2008. This study and expected inflow and infiltration improvements will continue to be completed in the 10-year planning period.

The existing WWTP will continue to provide wastewater treatment services for the City within the 10-year planning period. Wastewater flow projections indicate that an expansion of the WWTP from 4 to 7 mgd will be needed by 2015. The WWTP expansion will require planning, permitting, and design activities prior to construction. A summary of the tasks and funding sources required for this project is provided in Table 3.9.

Table 3.9 - Sanitary Sewer 10-Year Work Plan

Fiscal Year	Project	Task	Funding Source
FY08	Inflow & Infiltration Study	Study	Rates and Impact fees
FY11	WWTP Expansion	Preliminary Design	Rates and Impact fees
FY12	WWTP Expansion	Design & Permitting	Rates and Impact fees
FY13	WWTP Expansion	Construction	Rates and Impact fees
FY14	WWTP Expansion	Construction	Rates and Impact fees
FY15	WWTP Expansion	Final Completion and Start-Up	Rates and Impact fees

Source: Carollo Engineers 2007

In addition to the WWTP expansion, the City will be completing various other small projects in the wastewater system for continued operability and reliability and to serve new development areas. These include:

- Wastewater collection system improvements
- Forcemain projects
- Lift station projects
- Gravity sewer replacement
- A potential septic tank replacement program in Charlotte Park

Construction dates and cost estimates for these projects are provided in the *Capital Improvements Element*.

The City developed a Wastewater System Master Plan, which further refined the City's necessary capital improvements to meet future sewer service needs. This Master Plan was completed and adopted in August 2008.

X. INTRODUCTION – SOLID WASTE

Purpose

The purpose of the *Solid Waste* section is to ensure that necessary sanitation facilities and services are in place to provide for the needs of current and future populations in the City of Punta Gorda. This section identifies and describes the operations of waste collection within the city and describes the City's use of the Charlotte County Landfill. The element also outlines the City's plan for solid waste disposal over the life of the comprehensive plan.

Relationship to the City's Comprehensive Plan

The *Solid Waste Section* details the major issues of the department's existing and future needs and addresses those issues necessary to ensure solid waste facilities and services are in place to service the City's residents and businesses. The section relates primarily to the *Future Land Use Element*, *Capital Improvements Element, and Intergovernmental Coordination* as described below.

- The *Future Land Use Element* designates the locations and intensities of development which will generate solid waste.
- *The Capital Improvements Element* lists funding which assures that the necessary solid waste facilities and services will be in place to serve development. These expansions are generally phased in planning periods of five to ten years.
- *Intergovernmental Coordination* identifies the relationships between those agencies of the State of Florida that govern the collection and disposal of solid waste. The efforts also extend to collection and disposal of recycling material and hazardous waste.

XI. LEGISLATION - SOLID WASTE

Numerous federal, state, and local laws and rules regulate solid waste disposal. In addition to mandates, organizations such as the Southwest Florida Regional Planning Council (SWFRPC) have guidelines and policies with which solid waste operations are consistent. Among these rules and plans are chapters 187 and 403 Florida Statutes, the Federal Resource Conservation and Recovery Act, Rules 9J-5 and 62-701, the Florida Administrative Code, and the Strategic Regional Policy Plan (SRPP).

Federal Regulations

42 U.S.C.

The Resource Conservation and Recovery Act (RCRA) was adopted by Congress in 1976 and serves as the Federal legislation which regulates the disposal of municipal solid waste by setting minimum standards for waste disposal facilities. It also established resource recovery as a national priority and mandated efforts to better utilize and manage the recycling of wastes.

State Regulations

Florida Statutes

Chapter 187

Chapter 187, of the Florida Statutes, details the state's comprehensive plan. The policies called for:

- The reduction of landfilled wastes of thirty percent (30%) by 1994;
- County-wide solid waste collection systems which discourage littering and illegal dumping;
- Initiation of programs to develop or expand recyclable material markets;
- Strengthening and enforcement of regulations regarding generation, storage, treatment, disposal, and transportation of hazardous wastes;
- Establishment of systems for identifying the location, type, and quantity of hazardous materials;
- Encouraging coordination of intergovernmental and interstate waste management efforts: identification, development, and encouragement of environmentally sound wastewater treatment and disposal methods; and
- Encouragement of strict enforcement of hazardous waste laws and swift prosecution of violators.

Chapter 403

Chapter 403, Part IV, Florida Statutes, known as the 1988 Solid Waste Management Act, greatly altered the management of solid waste for local governments within the state. It provides the ground rules for the City's Sanitation Department. The act required local governments to start recycling programs in order to reduce the amount of waste being deposited into landfills by thirty percent (30%). The act also addresses the disposal of various other wastes such as lead-acid batteries, used oil, and tires. House Bill [HB] 851 passed by the 2002 Florida Legislature modified the solid waste management goals found in Section 403.706, Florida Statues. Modified legislation requires recycling programs to be designed to recover a significant portion of at least four [4] of the following materials from the waste stream prior to final disposal; newspaper, aluminum cans, steel cans, glass, plastic bottles, cardboard, office paper, and yard trash.

Florida Administrative Code (FAC)

Rule 9J-5

Rule 9J-5, FAC, specifies the requirements for local government comprehensive plans. It requires the City's Infrastructure Element to specific goals, objectives, and policies relating to solid waste. The Rule requires adoption of a minimum level of service standard and concurrency requirements indicating that the City will not issue development orders or building permits unless facilities and services are in place to manage a development's impact.

Chapter 62-701

Chapter 62-701, FAC, outlines specific state requirements regarding the operation and closure of landfills, solid waste permits, and the handling of special wastes. This rule also regulates the disposal and classification of waste, and prohibits the disposal of yard wastes in landfills with liners.

Local Regulations

The City has adopted local regulations which govern solid waste in order to be consistent with these state, federal, and regional policies.

City Ordinances

Chapter 10

Chapter 10, Article II Solid Waste Section 10-3 of the City's Code of Ordinances provides the general requirements of collection and disposal of solid waste generated within the City and the associated fees. It also allows for City Council to grant non-exclusive franchises for collection that will supplement present and future City programs within the corporate limits of the City and other such places as the City is authorized to collect solid waste.

County Ordinances

Chapter 1-12

Chapter 1-12 of the Charlotte County Codes regulates the operation of the landfill and service collectors within the County. The ordinance implements the programs required by the Federal and State governments, as well as the goals, objectives and policies identified in the comprehensive plan.

Other Regulatory Plans

Strategic Regional Policy Plan (SRPP)

The Southwest Florida Regional Planning Council assists local governments and state agencies in planning for future support service facilities before the need arises. The Council adopted a Strategic Regional Policy Plan (SRPP) in 2002 indicating that local governments within the region should support and establish recycling and hazardous waste disposal programs. Most importantly the SRPP promotes the region to maintain physical infrastructure to meet the growth demands of the area. The City's Comprehensive Plan must be consistent with the SRPP.

XII. DATA & ANALYSIS - SOLID WASTE

Inventory

The City of Punta Gorda provides curbside collection services for solid waste, recyclables, and yard waste. The City utilizes Charlotte County's 640 acre Zemel Landfill, the only landfill operating in the County for all of its' commercial and residential solid waste disposal. While the City handles their own commercial collection, private companies are sometimes used to collect and transport commercial waste products to the landfill. The City currently contracts with Southwest Florida Land Developers, utilizing the competitive bid process for disposal of yardwaste.

Hazardous waste disposal is available to the City's residents at the County's Mid County Mini-Transfer Station located in Port Charlotte. The County is proposing to provide a similar mini-transfer station in the Punta Gorda area within the next ten (10) years.

Zemel Road Landfill

The Zemel Road Landfill is the only solid waste operational landfill in Charlotte County. It is located outside of the City's southern boundaries, about one mile north of Lee County and just west of U.S. 41. Map 3.5 shows the location of the Zemel Road Landfill. It operates under a Class I permit issued by the Department of Environmental Protection (DEP). The permit, #00771017-001-S0/01, issued on July 20, 2004, expires on July 20, 2009. This permit allows Charlotte County to use 102 acres for disposal cells. The remaining 538 acres are devoted to wetlands mitigation, future disposal cells, and temporary holding areas for specific wastes, an administration building and other facilities. The landfill capacity is sufficient to service the anticipated demands of the City and the County to the year 2026.

Zemel Road Landfill Capacity

The projection of landfill site capacity is based on engineering design, operational techniques, projected population, and the size of the site, average per capita solid waste generation, and the type of lining being used as reported in the landfill's closure application. The landfill's estimated capacity is 4,901,744 cubic yards and is discussed in detail under Landfill Expectancy.

Map 3.5 - Zemel Road Landfill

Zemel Road Landfill Operations

Zemel Road Landfill consists of a shallow excavation into which a layer of solid waste is deposited. The waste accumulates over time and is formed into a mound. Upon reaching a design height, the solid waste receives a final cover of soil in accordance with Rule 62-701, Florida Administrative Code, which governs landfill site closures.

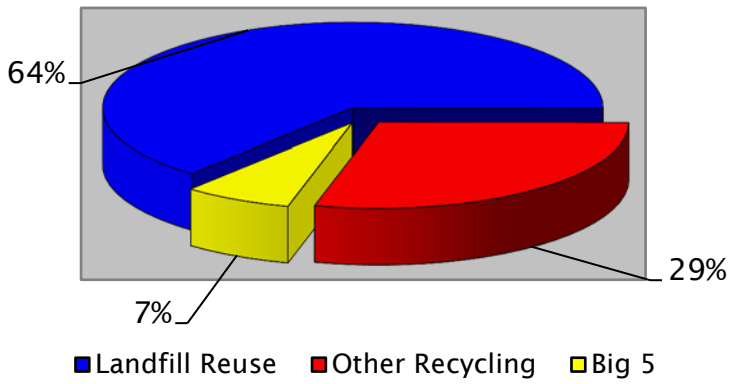
The City is included in the County's solid waste management and recycling program which are designed to provide for sufficient reduction of the amount of solid waste generated within the county. The goals provide, at a minimum, that the amount of municipal solid waste within its boundaries is reduced by at least thirty (30) percent. The County's program is designed to recover a significant portion of the following materials from the solid waste stream prior to final disposal at a solid waste disposal facility: newspaper, aluminum cans, steel cans, glass plastic bottles, cardboard, office paper, and yard trash as identified in Table 3-10.

Table 3.10 - County Wide Waste System Based FDEP State Reports 1996-2001

Landfill Reuse	64%
Other recycling	29%
Big 5 (Newspaper, Glass, Aluminum Cans, Plastic Bottles & Steel Cans)	7%

Source: Charlotte County Environmental Service 2004

Chart 3.3 - County Wide Waste System



City Collection

The City of Punta Gorda's Public Works Division provides collection services within the city limits. The predominant waste generators served by collection services are residential, commercial and yardwaste. The City customers receive collection service as follows:

- Residential Refuse: Residential household garbage is collected at curbside
- Multi-Family and Commercial Refuse: Commercial garbage may be collected at curbside or by dumpster depending on property configuration and amount refuse generation. Trash Compactor service is provided by Waste Management
- Yardwaste: Vegetative waste is collected curbside and may be placed in containers marked by yardwaste labels or placed in bundles not exceeding certain sizes. Dumpsters may be designated for the use of yardwaste at the option of multi-family or business customers
- Recycling: All homes within the City of Punta Gorda receive curbside recycling service. Multi-family complex recyclables may be collected at curbside or by dumpster depending on property configuration and amount materials generated
- Businesses within the City of Punta Gorda may contact Charlotte Sanitation to contract containers for recycling service
- Used Oil: Collected at the City of Punta Gorda Warehouse
- Appliances: collection of appliances requires special pick-up and must be requested by the customer
- No City locations accept hazardous waste, chemicals or tires. Household hazardous waste and sharps (needles) are accepted at the County Mini-Transfer Stations in Murdock. Tires may be taken to the Charlotte County Landfill on Zemel Road for disposal

Table 3.11 identifies the amount of waste generated within the City by user.

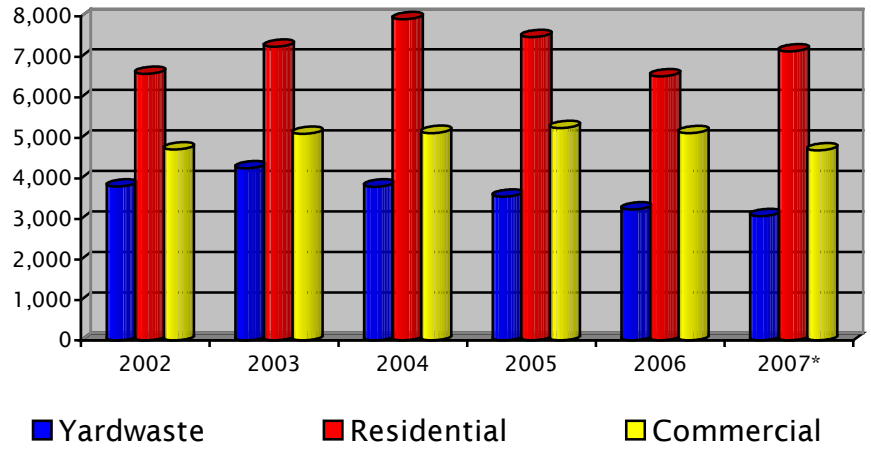
Table 3.11 - 2002-2007 Disposal Tonnage by User for the City of Punta Gorda

RESIDENTIAL	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07 Projected
TOTAL	6,580.50	7,245.64	7,925.33	7,487.86	6,517.12	**7,130.99**
MONTHLY AVG	548.38	603.80	660.44	623.99	543.09	**594.25**
COMMERCIAL	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07
TOTAL	4,710.53	5,097.08	5,117.88	5,243.04	5,115.41	**4,692.00**

MONTHLY AVG	392.54	424.76	426.49	436.92	426.28	**391.00**
YARDWASTE	**FY 02**	**FY 03**	**FY 04**	**FY 05**	**FY 06**	**FY 07**
TOTAL	3,797.10	4,245.06	3,795.42	3,547.56	3,229.26	**3,068.63**
MONTHLY AVG	316.43	353.76	316.29	295.63	269.11	**255.72**

Source: City of Punta Gorda Utilities 2007

Chart- 3.4 2002-2007 Disposal Tonnage by User for the City of Punta Gorda



Projections

As the City's population continues to grow, so will solid waste disposal needs. Table 3.12 displays the County's solid waste projection, including the City's numbers, through the year 2024.

Table 3.12 Total Solid Waste Disposal Projections

Year	Population BEBR	Population 2005 Air Space & Site Life Calculation Report	Tons of Waste per Year	Tons of Waste per Day
2005	154,030	158,859	147,739	**477**
2008	165,781	N/A	156,586	**505**
2010	171,340	174,712	162,482	**524**
2013	180,107	N/A	171,329	**553**
2015	192,800	190,569	177,229	**572**
2018	195,468	N/A	186,002,	**600**
2020	208,600	206,024	191,602	**618**
2024		280,293	260,673	**841**

2025	218,818	N/A	277,941	**897**

Source: 2008 Urban Design; 2007 Bureau of Economic and Business Research

The projections above include only solid wastes that will be landfilled. Recycled materials are not disposed of in the landfill and are not included in the above numbers. The City's recycled amount is 31.38% for FY 2007. The County's adjusted recycling rates places ceilings on specified categories of recyclables; therefore actual recyclable percentages may exceed those ceilings. The City's recycling efforts divert a percentage of waste annually; thereby reducing the amount of waste disposed of in the landfill. Intergovernmental coordination efforts employed by both entities will continue to reduce the amount of waste deposited into the landfill ensuring the existing the Zemel Road Landfill's projected capacity to serve Charlotte County, including the City of Punta Gorda, through 2026.

Table 3.13 displays the landfill's life expectancy reported by Charlotte County. These amounts include the City of Punta Gorda.

Table 3.13 – Projected Landfill Life Expectancy

Year	Waste Landfilled Cubic Yards	Cumulative Total Cubic Yards	Remaining Capacity Cubic Yards
2005	211,056	211,056	**4,901,744**
2010	232,117	443,173	**3,783,281**
2015	253,185	696,358	**2,559,493**
2020	273,718	970,076	**1,231,971**
2024	372,390	1,342,466	**-100,103**

Source: Charlotte County Environmental Services 2002

A closer look at the capacity level of the landfill is identified in Table 3.14 which identifies a remaining capacity of 272,287 cubic yards available at the end of the year 2023.

Table 3.14 - Zemel Road Landfill Remaining Capacity

Year	Remaining Capacity (cubic yards)
2005	4,901,744
2007	4,466,966
2009	4,015,399
2011	3,546,950

2013	3,061,649,
2015	2,559,493
2017	2,040,804
2019	1,505,689
2021	936,356
2023	272,287

Source: Charlotte County Environmental Services 2002

Level of Service (LOS)

The adopted LOS standard is 7.2 pounds of solid waste per person per day. The Sanitation Department reports, each house currently generates 42.39 pounds of refuse and yard waste per week which indicates 5.28 waste generated per person per day, which is below the adopted level of service of 7.2 pounds per person per day. This figure includes the collection of all solid waste, whether it is deposited into the landfill, composted or recycled.

Future Facility Needs

The majority of the facilities at the landfill were constructed or upgraded within the last ten years. Therefore no major capital expenditures are anticipated in the next planning period. Furthermore projections indicate that the landfill has sufficient capacity to dispose of solid waste until 2023.

Although the landfill and solid waste collection is sufficient to serve the City of Punta Gorda's needs for the next 15 years, the issue of landfill site expansion is of importance. Through the Conservation and Recreation Lands (CARL) program, the State and County have acquired significant portions of the lands which adjoin the landfill making the facility landlocked. Charlotte County has plans to continue operating a landfill in South County past the year 2026 through the expansion of the current cell structure into the remaining permitted acreage. Future disposal needs beyond this capacity requires investigating and acquiring additional land by 2035. The County plans to complete a needs analysis and financial analysis which would be performed seven or eight years prior to the time the permitted facility reaches capacity. The City will monitor these plans and will review the options as they arise.

XIII. INTRODUCTION – STORMWATER MANAGEMENT

This section, required by Rule 9J-5.011 (1) (h) Florida Administrative Code, contains existing regulations and programs which govern land use and development of natural drainage features. The regulations and programs will be identified for their strengths and deficiencies in maintaining the functions of the natural and urbanized drainage features.

Purpose:

Stormwater Management is "the planned control of surface runoff in natural and urban systems to prevent flooding and pollution (Model Local Government Stormwater Management

Program, DEP, 1993)." The purpose of the Stormwater Management section guides the City's existing stormwater management programs and provides a framework for future programs.

Relationship of the Stormwater Management sections to the comprehensive plan

The *Stormwater Management* section of the *Infrastructure Element* is closely related to several other elements of the comprehensive plan.

- Stormwater management issues are related to the *Future Land Use Element* because of potential development impacts of impervious surfaces and the drainage or run-off associated with these impacts into such natural systems as Charlotte Harbor.
- The stormwater management system impacts the *Conservation and Coastal Management Element* because of concerns pertaining to flooding issues and surface & groundwater quality concerns.
- Stormwater management is tied to the *Intergovernmental Coordination Element* as drainage basins generally extend beyond political boundaries and many agencies are involved in water management.
- Stormwater management is a major consideration when constructing transportation systems and must be evaluated according to the existing goals objectives and policies within the *Transportation Element.*

XIV. LEGISLATION – STORMWATER MANAGEMENT

Federal Regulations

Public Law 92-500, the "Federal Water Pollution Control Act"

U.S. Public Law 92-500, the "Federal Water Pollution Control Act," commonly referred to as the "Clean Water Act," was amended in 1977 to cover stormwater runoff into the waters of the United States. In 1990 the Federal Environmental Protection Agency issued regulations for implementation of the National Pollution Discharge Elimination System (NPDES), which is discussed in the section under Federal Programs.

The Water Quality of 1987

The Water Quality Act of 1987 required that the EPA issue or deny permits for industrial and certain municipal stormwater discharges. Permitting responsibility has since been transferred to the states. In Florida, the Department of Environmental Protection has the responsibility of issuing permits.

State Regulations

Florida Administrative Code (FAC)

Chapter 40D-2

Chapter 40D-2, Florida Administrative Code, "Basis of Review," includes stormwater system design criteria, as well as technical and administrative information for applicants and permits.

Chapter 40D-4 and Chapter 40D-40

Chapter 40D-4 and Chapter 40D-40, Florida Administrative Code, "Management and Storage of Surface Waters (MSSW)," states that SWFWMD governs surface water permitting and stormwater runoff. The rule implements the comprehensive surface water management permit system authorized in the Florida Water Resources Act (373 Florida Statutes, Part IV), and 62-25, Florida Administrative Code. A surface water management permit under 40D-4 must be obtained prior to construction, alteration, abandonment or removal of any dam, impoundment, reservoir, appurtenant work or works. The SWFWMD retains permitting authority for large projects, (over 100 acres) and projects where wetland resource (dredge and fill) applications are required. The rule regulates new surface water management systems and alterations to existing surface water management systems which will have a significant impact on the water resources of the District, including wetlands and other natural resources. This rule specifically does not apply to the use of wetlands for stormwater treatment.

Chapter 40D-6

Chapter 40D-6, Florida Administrative Code, "Works of the District Permit," states that a permit must be obtained prior to connecting with, placing construction across, discharging into or otherwise making use of works of the District. The rule protects existing works, and works for which planning is underway (e.g., canals, water control structures, rights-of-way, lakes and streams) from actions which would impair their ability to function as intended.

Chapter 40D-8

Chapter 40D-8, Florida Administrative Code, "Lake Levels Program," establishes guidelines (primarily in the floodplain) for development bordering lakes, conservation water storage and recharge capabilities of lakes. It also provides levels for operation of lake control structures and a means for providing information on district consumptive use permitting (CUP) activities.

Chapter 62N-16

Chapter 62N-16, Florida Administrative Code, "Prohibition of Pollutant Discharges," covers the powers and duties of the DEP, as they relate to prohibition of pollutant discharges (as defined in Florida Statutes 403.803(13), and the removal of prohibited discharges.

Chapter 62-25

Chapter 62-25, Florida Administrative Code, "Regulations of Stormwater Discharge," provides minimum criteria for discharge into surface waters and groundwaters of the State. The rule's basic objective is to achieve 80-90 percent removal of stormwater pollutants before discharging into receiving waters. The rule states that facilities must treat the runoff from the first one inch of rainfall, or as an option for projects with drainage areas less than 100 acres, facilities which provide retention, or detention with filtration, of the first one-half inch of runoff.

Chapter 62-3

Chapter 62-3, Florida Administrative Code, "Water Quality Standards," provides minimum criteria which govern stormwater drainage necessary to protect the designated uses of State waters. This legislation provides detailed criteria for both surface water and groundwater protection.

Chapter 62-302

Chapter 62-302, Florida Administrative Code, "State Surface Water Quality Standards," classifies surface waters into one of five different categories based upon the expected uses of each waterbody. Establishes minimum criteria for each surface water classification in order to protect public health and enhance the quality of waters of the State.

Chapter 62-312

Chapter 62-312, Florida Administrative Code, "Dredge and Fill Activities," requires permits for dredge and fill activities in surface waters of the State. It also requires permits for dredging and filling in, on, or over navigable waters and provides for mitigation criteria and exemptions.

Chapter 62-340

Chapter 62-340, Florida Administrative Code, "Delineation of Wetlands and Surface Waters", provides the methodology for delineating wetlands and surface waters. Chapter 62-4, Florida Administrative Code, "Permits," DEP/SWFWMD contains the rules regarding permit standards (standards for issuing dredge and fill, stormwater, and water quality permits). It provides for the classification and exemption of certain waterbodies for permitting purposes and includes water quality standards. The rule also provides that permits cannot be issued for sewage facilities that directly discharge to an Outstanding Florida Water (OFW) which would lower ambient water quality, or for discharges which would degrade a downstream OFW. In order to receive permits, discharges must be in accordance with DEP standards as set out in 62-600 Florida Administrative Code

130BUChapter 62-40

Chapter 62-40, Florida Administrative Code, "State Water Policy," addresses many different aspects of water resource protection and management. The stormwater and surface water management components are critical to stormwater utilities and levels of service. In 1990, the State Water Policy was revised to

include policies relating to stormwater discharge rates, volume, and pollution loads discharged from a site.

131BUChapter 62-43

Chapter 62-43, Florida Administrative Code, "Surface Water Improvement and Management Act" (SWIM), establishes criteria for: surface water priority lists; approval of priority ranking lists; review of plans for ranked water bodies; and establishment of uniform and consistent water body management plans. The rule directs the Water Management Districts to "design and implement plans and programs for the improvement and management of surface waters". The program ranks waterbodies for statewide and regional significance for preparation of action-oriented management plans. These plans serve as a guide to local governments and water management districts in protecting and restoring these waterbodies through specific projects. Under this Act, SWFWMD has prioritized those surface waters most in need of environmental restoration, and is developing plans, along with the respective local governments, for their restoration.

Chapter 62-600

Chapter 62-600, Florida Administrative Code, "Grizzle-Figg Advanced Waste Treatment Act", is intended to protect Florida's coastal waters and estuaries by requiring that effluent discharged from waste treatment facilities into certain Florida waters be treated to advanced waste treatment (ATW) standards where deemed necessary by DEP. It also establishes criteria for the discharge of wastewater to certain wetlands.

Chapter 62-620

Chapter 62-620, Florida Administrative Code, "Wastewater Facility Permitting," provides for permits constructing, modifying, or operating a domestic or industrial wastewater facility or activity which discharges pollutants into waters of the State.

Chapter 62-625

Chapter 62-625, Florida Administrative Code, "Pollutant Pre-Treatment Requirements", provides the pre-treatment requirements for existing and new sources of pollution.

Florida Statutes

Chapter 373

Chapter 373, Florida Statutes, "Florida Water Resources Act (FWRA)," regulates the construction, alteration, maintenance, operation, and abandonment of dams, appurtenant works, impoundments, reservoirs, and works affecting waters of the State. The goal of the Act is to prevent harm to the water resources of the State. This statute also provides for the permitting of various activities including management and storage of surface waters (Part IV) and consumptive uses of water (Part II). The Act creates Water Management Districts, who together with the DEP, are the agencies responsible for implementing the regulatory components of the FWRA. The FWRA establishes minimum flow levels from surface water courses and minimum water levels for lakes and groundwater aquifers.

Chapter 380

Chapter 380, Florida Statutes, "The Florida Environmental Land and Water Management Act of 1972", ensures a water management system that will reverse the deterioration of water quality and provide optimum utilization of our limited water resources. The chapter also facilitates orderly and well-planned development and protects the health, welfare, safety, and quality of life of the residents of the state.

137BUChapter 403

Chapter 403, Florida Statutes, "Water Resources Act", provides the Department of Environmental Protection with the authority to establish water quality guidelines and recognizes stormwater runoff as an important resource. The act also sets water pollution permitting conditions, establishment of National Pollution Discharge and Elimination System (NPDES) programs, and the formation of stormwater management programs. In addition, the act gives the City the power to establish and administer a local pollution control program if it complies with the provision set forth within this act.

Local Regulations

Chapter 6A, National Pollution Discharge Elimination System

This ordinance, known as the City of Punta Gorda's Stormwater Pollution Control Ordinance, was established for the purpose of maintaining efficient economic and safe operation of the separate storm sewer system and for the protection of the health safety and general welfare of the public. It is intended to prevent and abate pollution through the regulation and control of connections and discharges to the separate storm sewer system of the City.

Implementing Plans and Programs

Federal Programs

National Pollution Discharge Elimination System (NPDES)

In 1987, the Federal Clean Water Act required the U.S. Environmental Protection Agency (EPA) to establish the National Pollutant Discharge Elimination System (NPDES) and ensuing Municipal Separate Storm Sewer System (MS4) permitting programs. The program requires local governments to comply with certain conditions in order to obtain permits for existing and future stormwater management systems.

Receipt of a permit requires the preparation of an extensive baseline inventory of stormwater conveyances including ditches, paved channels and manmade canals that discharge into the Waters of the United States. Further, a water quality management plan is required that meets federal standards. The City of Punta Gorda is required to map stormwater outfalls. To achieve this mandate the City is required to develop a comprehensive stormwater quality management program, demonstrate the legal authority to control the quality of stormwater runoff, and fund the implementation of the stormwater quality management programs. An element of the NPDES MS4 program requires that permits be obtained for municipal construction projects of five (5) acres or more, landfills, power plants, airports, mass transit, vehicle maintenance facilities, and wastewater treatment plants

under Phase I. Phase II encompasses anything 1 acre and above and includes those municipalities not included under Phase I.

Charlotte Harbor National Estuary Program (CHNEP)

In 1995, Charlotte Harbor was accepted into the National Estuary Program which is administered locally through the Southwest Florida Regional Planning Council (SWFRPC). The mission of the CHNEP is to assess the condition of Charlotte Harbor and establish requirements and targets for restoration and preservation of its natural resources. These efforts culminated in the development of a Comprehensive Conservation and Management Plan (CCMP) and financing plan for Charlotte Harbor, a blueprint that will prioritize actions and identify the means to complete them. In developing and implementing the plans, the CHNEP coordinates with the Surface Water Improvement and Management (SWIM) program of the Southwest Florida Water Management District (SWFWMD).

State Programs

Surface Water Improvement Management Plan

The Surface Water Improvement and Management Act of 1987 (Chapter 373.451-373.4595 Florida Statutes) created the Surface Water Improvement and Management Trust Fund for the purpose of providing state appropriated funds for the implementation of SWIM plans (373.459 Florida Statutes). Each individual water management district is required to make an annual request for funding of its SWIM plans. These requests may include funds for the purchase of lands and waters for the purpose of protecting surface waters, but may not be used for planning, construction or expansion of treatment facilities for domestic or industrial waste disposal.

The Charlotte Harbor SWIM program was launched in 1992. The goal of the SWIM program is to protect the 270 square mile Charlotte Harbor Estuary by:

- Preserving natural and functional components of the ecosystem while, if feasible, restoring degraded portions
- Preserving or restoring the quantity and quality of water necessary to support biological communities
- Educating the public of the benefits for conserving and preserving the harbor system
- Developing and implementing management plans for each of the harbor's major tributaries

The SWIM program is important to the City stormwater management program because it may determine areas of stormwater runoff which are polluting the harbor thereby requiring stormwater management. The water quality data obtained through the program may indicate the trouble spots as well as identify the types of pollutants affecting the harbor.

Intergovernmental coordination efforts of the SWIM program continue through the Charlotte Harbor SWIM Advisory Committee, which include technical personnel from the SWFWMD, SFWMD, FDEP, Florida Fish and Wildlife Conservation Commission (FFWCC), Southwest Florida Regional Planning Council (SWFRPC),

Charlotte and Lee County governments, Charlotte County and other municipalities, the Charlotte County Extension Service, local environmental organizations, and private citizens concerned with the preservation, restoration and protection of the estuary and its watershed. The SWIM Advisory Committee continues to be used for purposes such as developing and assessing SWIM projects, reviewing progress, and preparing updates of the plan as the management program proceeds.

Funding for the SWIM program comes from the SWIM Trust Fund which distributes funding after approval of projects by the appropriate water management district, DEP, FFWCC, and advisory committees associated with the SWIM program.

Outstanding Florida Waters (OFW)

The Outstanding Florida Waters program (OFW) is administered by the Florida Department of Environmental Protection. This program provides a special category of water bodies worthy of additional protection because of their specific attributes (Chapter 17-3.041(1) Florida Administrative Code). Water bodies that occur within national parks, wildlife refuges, national preserves, and seashores, wild and scenic rivers, aquatic preserves, state parks and recreation areas, and national marine sanctuaries automatically receive OFW designation. The rules provide that permits cannot be issued for direct discharges which would degrade a downstream OFW. The rules also require that dredge and fill projects which are located within or significantly degrade an OFW must be clearly in the public interest. Additional water quality protection is provided to an OFW with regard to stormwater discharge facilities, which must treat an additional 50% of the runoff from a site. In 1979 Gasparilla Sound, Charlotte Harbor, and Cape Haze were named OFW's.

Protection of the Charlotte Harbor estuary is necessary as the City and surrounding areas adjacent to the Harbor continue to develop. Efforts should continue to declare Horse Creek, a tributary to Peace River and Charlotte Harbor, an OFW. Previous efforts failed when Charlotte County tried to protect the Harbor from future impacts from mining activities that are currently being proposed and permitted by the Department of Environmental Protection.

Environmental Resources Permitting (ERP)

The ERP combines DEP's wetland resource permit with the Water Management Districts' Surface Water Management Permits (SWMP's). The process consolidates, reviews existing dredge and fill, stormwater management and sovereign lands permits, and is generally issued through consolidation of parts of Chapter 403, Florida Statutes currently implemented by the SWFWMD and DEP under Chapter 373, Florida Statutes

Environmental Protection (DEP) Surface Water Sampling Program

The DEP operates a local surface water sampling program in Charlotte County to maintain public health and safety. The program collects results from samples of water taken by a contacted engineer, at various City Location to determine water quality located along the Peace River and Charlotte Harbor. The program has been in operation since 1990 and the results are

logged into the DEP's STORET Data System, which allows the data to be shared with other agencies. The data gathered from this program is useful in determining surface water quality and is used as a method to gauge the amount of pollutants a water body receives and when. It is a tool in determining the success of surface water management programs.

Community Development Block Grants(CDBG's)

Community Development Block Grants (CDBGs) are grant monies available from the state for specific purposes. Sometimes these funds can be used for improvements to components of a stormwater conveyance system. At this time there are no funds from CDBG funds being utilized for this purpose.

Local Programs

Charlotte County Master Stormwater Management Plan

The completion of the Charlotte County Stormwater Management Plan (MSMP) assisted the City's Stormwater Management by identifying those basins associated with the City. The three basins identified in South County were determined to be less dependent on structural controls, and were identified as basins which conveyed overland flow to primary drainage ditches, creeks, or rivers. Therefore, any flooding associated within these basins was directly related to the need for a maintenance program.

The actual implementation of the maintenance of the priority ditches benefits the City by providing proper water conveyance throughout the City. The city regularly re-grades troubled areas of drainage that may constitute an area of standing water for 72 hours or greater. The City provides a daily maintenance program which maintains catch basins and each basin is cleaned at least once through the course of a year.

Stormwater Permits and Development Review

In cooperation with the water management districts, the City's Development Review Committee reviews stormwater permits as a part of the building permit application process as well as preliminary and final subdivision plat applications. Stormwater applications are reviewed for compliance with the City's Stormwater Pollution Control Ordinance, Sec 6A-1.1. For preliminary plats, the City personnel forward recommended changes and comments to the applicant, the Planning Commission and the City Council. For final plats, any additional comments and recommendations are forwarded to the applicant and the City Council.

XV. DATA AND ANALYSIS – STORMWATER MANAGEMENT

Stormwater Overview

Water flowing over the land during and immediately following a rainstorm is called stormwater runoff. In undeveloped areas, stormwater is cycled as part of the natural environment. The movement of water through the environment, from the clouds to the earth, and back again, is called Hydrologic Cycle. Natural processes which control stormwater are in constant change: streams change course, natural erosion occurs, and vegetation and soil permeability change with the seasons. When humans alter the land within a watershed the changes to the natural processes accelerate creating a need for constructed stormwater management systems.

In urbanized areas and new developments, poor drainage from an increase in impermeable surfaces can result in an increase in stormwater runoff. Buildings, roads, parking areas, and exposed surfaces increase the volume and speed of stormwater runoff. Stormwater drainage systems collect this stormwater runoff and carry it away from roadways and structures to a discharge point, preventing flooding and protecting property and watersheds.

Stormwater drainage systems may consist of curbs, gutters, storm drains, swales, channels, ditches, pipes, and culverts as well as a variety of other drainage technologies. Since stormwater drainage systems are not typically designed to treat stormwater, they may be paired with a treatment technology to address any water quality issues.

Increased runoff prevents water from seeping into the ground where pollutants may be filtered out before entering the watershed. The increase in stormwater runoff may result in flooding, soil erosion, and water pollution on a development site as well as downstream. A sound stormwater management program will reduce run-off impacts to our environment resulting from land development.

The volume of stormwater generated by a storm event, such as an excessive rainstorm, depends upon the total amount of rainfall, minus that lost by infiltration, transpiration, evaporation, and surface storage. The amount of these losses is a function of climate, soils, geology, topography, vegetative cover and, most importantly, land use within a watershed.

Land use directly affects hydrology in several ways:

- Changes in stormwater peak flow characteristics
- Changes in runoff volume
- Changes in water quality

- Changes in hydrologic amenities

Of all the land use changes that affect an area's hydrology, urbanization is the most important. However, other land use changes within a watershed such as agriculture, forestry and mining also alter the hydrologic cycle and create a need for stormwater management.

Inventory

This section, mandated by Rule 9J-5.010 (1) (e) Florida Administrative Code, identifies operating responsibilities of stormwater management facilities, geographic service areas, predominant types of land uses, the design capacity of the stormwater management facilities, current demand, and the level of service provided by the facilities.

With minimal boundary changes since the time of Plan adoption, the City of Punta Gorda encompasses approximately 23 square miles including open water uplands and urbanized development along the shorelines of the Peace River and Charlotte Harbor. The City's jurisdictional boundaries contain all or part of ten (10) drainage basins as illustrated on Map 3.6.

Stormwater Drainage and Management Facilities

Some of the City's drainage basins lie within the nearly pristine Charlotte Harbor State Buffer Preserve to the south of the urbanized area of the City. These basins drain into Charlotte Harbor via sheet flow, natural streams and some man-made conveyances such as ditches and abandoned canals. In addition to the natural water conveyance, the City of Punta Gorda's stormwater is conveyed through curbs, gutters, swales, catch basins, drainage pipes and outfall discharge structures. In most cases, these drainage systems were designed to quickly convey stormwater runoff away from developed areas in order to minimize flooding. At the time these systems were designed, little emphasis was placed on stormwater water quality issues. Thus while the system is efficient at moving the stormwater it was not designed to minimize contamination of the runoff. However, the swale system designed throughout the City is looked upon favorably by the FDEP and is an accepted and approved method of removing pollutants before entering into the state waterbodies.

Map 3.6 - Drainage Basins affecting the City of Punta Gorda

Land Use and Effects of Urbanization on Stormwater Management

The proximity of the City of Punta Gorda, along the shores of the Charlotte Harbor Estuary, can be greatly impacted by contaminants from stormwater run-off. Encompassing approximately 4360 square miles and covering all or part of six counties, the watershed includes run-off from the numerous municipalities and their associated commercial and residential development. The watershed also includes a variety of agricultural and mining operations. All of these man-made alterations to the natural environment directly or indirectly

impact the run-off quality and quantity of both surface and groundwater resources within the watershed, which ultimately impact the quality of the estuaries ecosystem.

As a watershed urbanizes, components of its natural stormwater systems (i.e., natural depressional storage, wetlands, floodplains) may be removed or altered. Streets, sidewalks, parking lots and buildings cover the soil, eliminating vegetation and compacting the soils. The land's surface becomes more impervious. Rainfall no longer soaks into the ground as readily as before. This causes an increase in runoff and accelerates the speed at which runoff flows (the peak discharge rate.)

In an undeveloped area, the natural physical, chemical, and biological processes interact to recycle most of the materials found in stormwater. As human land use intensifies, these natural processes are disrupted and everyday activities add materials to the land surface. Leaves, animal wastes, oil, greases, heavy metals, fertilizers, pesticides and other materials are washed off by rainfall and are carried by stormwater to our wetlands, lakes, rivers and bays. These materials can create high pollutant loadings of:

- Sediments which clogs waterways, smothers bottom living aquatic organisms, and increases turbidity, thereby decreasing light penetration into water bodies which reduces beneficial aquatic vegetation such as sea grasses.
- Oxygen demanding substances which consume the oxygen within water bodies, sometimes creating an oxygen deficit that leads to fish kills.
- Nutrients (nitrogen, phosphorus) which cause unwanted and uncontrolled growth of algae and aquatic vegetation which, in turn, changes the biological communities of our rivers, lakes and estuaries.
- Heavy metals (lead, cadmium, chromium, copper, zinc) which can disrupt the reproduction of fish and shellfish and accumulate in their tissues.
- Petroleum hydrocarbons (oils, greases, polyaromatics) which are toxic to many aquatic organisms.
- Coliform bacteria and viruses which can contaminate lakes and shellfish waters closing them to swimming and harvesting.
- Excessive fresh water which changes the salinity of estuaries, alters the types of organisms which live in estuaries, and disrupts this important nursery area.

Although Florida's stormwater management programs helped to reduce stormwater pollution from land uses changed after 1982, many of the state's water resource problems are caused by older stormwater management systems that were built primarily for drainage. Modifying these older systems to reduce their impacts on Florida's water bodies presents a major challenge not only to the state, but also to local governments.

The City of Punta Gorda currently addresses stormwater quality through a series of site specific and programmatic activities which include:

- Installation of inlet placards at all inlets that discharge into surface water bodies

- Street sweeping program which reduce the amount of pollutants and debris from entering surface waters
- Isolated improvements on a case by case basis or in conjunction with other infrastructure improvements being made to public and private sites
- Installation of Grate Inlet Baskets (GIB's) in numerous stormwater basins to collect & hold debris and sediment before entering into State water bodies
- Installations of under-drains at various locations within the city limits to filter out pollutants before entering a State water body

The City is fully aware of the necessity for ecosystem or watershed management in order to protect the health of the estuary that surrounds it. It is also committed to the continuance and completion of these studies in order to generate the best management strategies for the City's future stormwater management programs. As part of the 2008 fiscal year, staff will undertake the stormwater master plan in accordance with the NDPES monitoring requirements.

As the population grows, the area covered by impervious surfaces will also increase. The result may also increase surface water pollution entering the watershed. As the quantity of stormwater runoff and the public's desire for higher levels of service increases, the ability of current facilities to handle runoff will decrease. Stormwater management techniques, as described in this element, will be used to protect water quality and prevent flooding.

The continuing operation of the City's existing stormwater management system requires periodic maintenance to remove siltation, sedimentation, debris, and nuisance vegetation. Such maintenance requires access to and along canals, ponds, and lakes. In some cases access is not available, principally because the City's stormwater management system was constructed prior to the establishment of regulations requiring the provision of adequate easements.

Throughout the City there are individual private stormwater management systems with lakes and drainage ways which serve only the on-site drainage requirements of specific developments and are not considered part of the city-wide stormwater management system. Maintenance responsibility for these on-site private facilities lies with private entities. Monitoring to confirm that these private systems are adequately maintained is the responsibility of the private development for SWFWMD permit criteria.

Public Stormwater Management Facility Development

The development of stormwater management facilities in the City is relatively difficult and expensive due to the City's low elevation, engineering and real estate constraints. The designing and building of such facilities are generally contracted out to private engineering and construction firms. The primary concerns relating to stormwater management facilities mainly relate to capacity and design life.

Quality of Discharge

The City's approach to level of service for quality of discharge should be consistent with the recommendations being developed by the Charlotte Harbor National Estuary Program (CHNEP) and the requirements of State Water Policy.

Level of service criteria for storm water quality should at a minimum maintain water quality consistent with the final pollutant load reduction goals or TMDL's (total maximum daily loads) established by the local State and Federal water quality programs. Pollutant load reduction goals will be implemented according to a schedule provided in the Southwest Florida Water Management District's Water Management Plan and FDEP.

Quantity of Discharge

Establishment of level of service standards for quantity of discharge must account for various magnitudes of storm events and acceptable levels of flooding. In 1993 the Water Management Districts throughout the state prepared draft stormwater level of service standards for consideration. These levels of service standards were based on providing varying degrees of flood protection based on the nature of the facility and the acceptability for potential flooding. The quantity level of service standards advanced by the Water Management Districts is identified in the following table. Roads shall be passable during flooding. Roadway flooding depth $\leq$6" depth at the outside edge of pavement is considered passable. Flooding at sites refers to standing water in agricultural land, developed open or green space (yards and parking lots, etc.) and undeveloped lands designated for future development.

Stormwater Flood Risks

Floods are one of the most common hazards in the State of Florida. In the City, flood effects are local issues, impacting a neighborhood or community, but can impact large area, affecting entire river basins and multiple states. The City's low elevation and poorly drained soils make it susceptible to numerous flooding events. The periodic flooding results from tropical weather as well as prolonged periods of heavy rains.

The residents and businesses of the City of Punta Gorda participate in the National Flood Insurance Program (NFIP). The NFIP is a federal program enabling property owners in participating communities to purchase insurance as protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages.

The land area covered by the floodwaters of the base flood is the Special Flood Hazard Area (SFHA), also known as the 100 year floodplain. This area is the standard used by most federal and state agencies as a standard for floodplain management and to determine the need for flood insurance. A structure located within this special flood hazard area has a 30 percent chance of suffering flood damage during the term of a 30 year mortgage.

Floodplain Management

Responsibility for flood loss reduction is shared by all units of government— local, state and federal—and the private sector. Fulfilling this responsibility depends on having the knowledge and skills to plan and implement needed floodplain management measures. The fundamental floodplain management program that most others are built on is the National Flood Insurance Program (NFIP).

Floodplain management is the operation of a community program of corrective and preventative measures for reducing flood damage. These measures take a variety of forms and generally include requirements for zoning, subdivision or building, and special-purpose floodplain ordinances.

The City is rated by the NFIP under the Community Rating System (CRS). The Community Rating System encourages and rewards community efforts aimed at reducing flood losses and promoting the awareness of flood insurance.

A major benefit to residents of CRS rated communities is that they may receive flood insurance premium rate credits which lowers insurance costs. FEMA rates each community on a scale from one to ten with one being the best obtainable rating. The City of Punta Gorda has a class rating of Class 6. This classification results in a 20% reduction in residents' flood insurance rates.

Maintenance of Public Stormwater Management Facilities

The Public Works Engineering Department and Right-of-Way Division is tasked with providing routine maintenance of the City's stormwater conveyance systems, stormwater management facilities, and stormwater infrastructure. The Public Works Engineering Department receives service requests from residents who require routine maintenance of their stormwater roadside conveyance system (drainage swales). These requests are then inspected and scheduled accordingly with the Right-of-Way Division.

Level of Service

Level of Service for Stormwater Facilities

The City requires all applicants to obtain a stormwater management permit from the Southwest Florida Water Management District (SWFWMD) for all projects requiring the Development Review Committee (DRC) review. The City requires that stormwater management projects provide for storage and filtration of the first one-half inch of rainfall for all projects. Also, the post-development run-off rate may not exceed the pre-

development rate of the site. The City also requires that, if on-site retention is not required, a finding must be made that a city facility can handle the stormwater run-off. In addition to the letter of acceptance from SWFWMD, the following standards must be met:

- A finding must be made that the existing stormwater and drainage facilities, including any on-site facilities required of the applicant/developer, will retain a 25-year frequency design storm with a 24-hour duration in accordance with current Southwest Florida Management District regulations for a type 2 modified storm with seven and five-tenths (7.5) inches of rainfall.
- A finding must be made that the stormwater retention needs of the service area for which building permits have been issued, or which are occupied, available for occupancy, or for which stormwater facilities capacity have been reserved, have sufficient existing retention capacity.

Level of Service for Roads

All roads being built must also meet stormwater requirements as follows:

- Arterial and Collector Roadways shall be designed with the lowest pavement elevation at or above the design high water elevation resulting from a 25-Year frequency, 24-Hour duration rainfall event distributed in accordance with SCS TR-55 Type 2 modified storm, assuming an antecedent moisture condition 2.
- Local Residential Streets shall be designed with the pavement centerline at or above the design high water elevation resulting from a 5-Year frequency, 24-Hour duration rainfall event assuming an antecedent moisture condition 2.
- Parking Facilities shall be designed with a maximum temporary detention depth of 0.75 feet, resulting from a 5-Year frequency, 24-Hour duration rainfall event distributed in accordance with SCS TR-55 Type 2 modified storm, assuming an antecedent moisture condition 2. Retention storage above parking areas is prohibited.

Future Direction

The City of Punta Gorda will continue to work towards the Goals, Objectives, and Policies set forth in this document. The City will implement the goals, objections and policies (GOP) by:

- Developing and implementing Master Stormwater Management Plan
- Managing stormwater runoff to minimize flooding of lands and the degradation of water quality
- Ensuring that stormwater management facilities are in place and available to serve all new development
- Maintaining and working towards improving our Community Rating System certification under the Federal Emergency Management Agency
- Ensuring stormwater management programs are adequately funded and implemented
- Managing development within the Federal Emergency Management Agency 100-year floodplain

- Undertaking a recently approved grant from the FEMA/DCA to move forward with a study and design to reduce the flooding of the downtown and nearby areas along the Peace River that normally flood

Challenges for the City are associated with the impact of development on the stormwater management system and the future annexation of vacant lands. The development review process, permit issuance, and level of service standards assist the City in offsetting the impact of development on the stormwater management system.

XVI. GOALS, OBJECTIVES AND POLICIES

Goal 3.1: To provide an efficient and cost effective water and sanitary sewer utility system to all residents of Punta Gorda and the unincorporated service area through the 2018 planning horizon, consistent with the Ten Year Water Supply Plan, in the most economically efficient and environmentally responsible manner.

Objective 3.1.1: The City of Punta Gorda will provide a safe and efficient water system to meet the present and projected future potable water needs.

Policy 3.1.1.1: Continue to utilize Shell Creek as a water source to meet the City's 20 year water demand needs.

Measurement*: The annual monitoring and implementation of the water use permit.*

Policy 3.1.1.2: The City of Punta Gorda will construct an off stream reservoir as an alternative water supply project as identified in the Southwest Florida Water Management District (SWFWMD) Regional Water Supply Plan

Measurement: *The completed planning, engineering and construction of the off stream reservoir.*

Policy 3.1.1.3: The City of Punta Gorda will comply with the conditions and requirements set forth in the City's existing water use permit.

Measurement: *Annual monitoring of the water use permit.*

Policy 3.1.1.4: Punta Gorda will evaluate the technical, financial, and regulatory feasibility of a water reuse system to offset demands on the potable system.

Measurement: *The completion of the water reuse study.*

Policy 3.1.1.5: The City of Punta Gorda will utilize and maintain the City's hydraulic water model to identify inefficiencies in the water distribution system and will develop water distribution system capital improvement projects to eliminate these deficiencies and improve the reliability in the water system.

Measurement: *Number of identified inefficiencies and capital improvements completed.*

Objective 3.1.2: The City of Punta Gorda will continue to provide a safe and efficient sanitary sewer system to meet the present and projected future utility needs.

Policy 3.1.2.1: The City of Punta Gorda will implement upgrades to its wastewater facilities as identified through the Wastewater Collection System Master Plan and other planning activities.

Measurement: *The completion of the Wastewater Collection System Master Plan and other relevant planning studies and the implementation of the recommendations.*

Policy 3.1.2.2: Punta Gorda will evaluate the technical, financial, and regulatory feasibility of a water reuse system to offset demands on the potable system.

Measurement: *The completion of the water reuse study.*

Policy 3.1.2.3: Expand the existing wastewater treatment plant by 2015 to meet the future sanitary sewer needs and wastewater projections.

Measurement: *The completion of the wastewater treatment plant expansion.*

Policy 3.1.2.4: Comply with the conditions and requirements set forth in the City's wastewater permit.

Measurement*: Annual monitoring of the wastewater permit.*

Policy 3.1.2.5: Evaluate the cost-benefit of the elimination of septic system areas within the Utility Service Area.

Measurement: *The number of septic tanks eliminated as a result of the area specific analysis.*

Policy 3.1.2.6: The City of Punta Gorda will identify inefficiencies in the wastewater collection system and develop wastewater capital improvement projects to eliminate these deficiencies and improve the reliability in the wastewater system.

Measurement: *Number of identified inefficiencies and capital improvements completed.*

Policy 3.1.2.7: Complete an inflow and infiltration study of the wastewater collection system by 2009 to increase the technical feasibility of the development of a reuse water system.

Measurement*: Completion of the inflow and infiltration study.*

Policy 3.1.2.8: Continue investment in capital improvement projects that reduce inflow and infiltration into the wastewater collection system to increase the technical feasibility of the development of a reuse water system.

Measurement: *The capital improvements projects completed that reduce inflow and infiltration in the wastewater collection system.*

Goal 3.2: The City of Punta Gorda will continue to plan for the delivery of water and waste water services to facilitate a compact and contiguous urban growth pattern.

Objective 3.2.1: Punta Gorda will adhere to the following planning principles regarding utility extensions.

Policy 3.2.1.1: Punta Gorda will develop and update a Water Supply Master Plan and a Water System Master Plan to meet present and projected needs for the five (5) year planning period and build-out planning period.

Measurement: *The completion of the Water Supply Master Plan and a Water System Master Plan.*

Policy 3.2.1.2: The City of Punta Gorda will review the Plans every five (5) years or more frequently if needs dictate.

Measurement: *Implementation of the five (5) year plan recommendations.*

Policy 3.2.1.3: The City of Punta Gorda will collaborate with the Peace River/Manasota Regional Water Supply Authority to develop joint projects such as the Regional Loop to increase the City's Water system reliability.

Measurement: *Number of joint agreements signed to further regional water supply goals.*

Policy 3.2.1.4: Utility extension over the next planning period will involve consideration of proximity to existing urbanized areas for the effect on the efficient use of existing and planned utilities infrastructure, the City's future land use needs, and the desire to encourage compact and contiguous growth.

Measurement: *The number of utility extension projects completed.*

Policy 3.2.1.5: In planning the extension of water and sewer lines, Punta Gorda will discourage increasing planned densities in unincorporated coastal high hazard areas that would encourage urban sprawl.

Measurement: *The number of utility extension proposals reviewed.*

Policy 3.2.1.6: In unincorporated areas served by water lines but not sewer service the City will consider connection of existing development to adjacent water distribution lines.

Measurement: *The number of new connections of water distribution lines to existing and new development.*

Policy 3.2.1.7: Water and sewer line extension proposals will be reviewed for compact and contiguous development and provision of services to land uses encouraging or increasing economic development efforts.

Measurement*: Number of line extension proposals reviewed.*

Objective 3.2.2: Coordinate with the Future Land Use map to ensure that development and building permits are issued based on adequate potable water availability and an adopted level of service.

Policy 3.2.2.1: Modify the existing level of service standard ordinance for potable water to 141 gallons per person per day or 287 gallons per ERU per day to meet ~~maximum~~ average day water demands.

Measurement: *Adoption of new level of service standard.*

Policy 3.2.2.2: Modify the existing level of service standard ordinance for wastewater to 83 gallons per person per day or 169 gallons per ERU per day to meet wastewater treatment capacity.

Measurement*: Adoption of new level of service standard.*

Policy 3.2.2.3: Review all land use amendments, zoning changes, or utility service area extensions to determine the availability of utility system capacity.

Measurement: *Number of applications reviewed.*

Policy 3.2.2.4: Deny the issuance of permits for new development that would result in exceeding the adopted water level of service standards.

Measurement: *Number of applications not issued due to lack of concurrency with adopted level of service standard.*

Goal 3.3: The City of Punta Gorda will develop conservation measures to assist in decreasing water consumption on a per capita basis.

Objective 3.3.1: The City of Punta Gorda will continue to evaluate and implement conservation measures to decrease per capita demand to a goal of 123 gpd as documented in the existing water use permit.

Policy 3.3.1.1: The City will evaluate the feasibility of developing a reuse system as outlined in the existing water use permit.

Measurement: *Completion of reuse feasibility study.*

Policy 3.3.1.2: Modify the City's existing Land Development Regulations to encourage water conservation and Florida friendly landscaping.

Measurement: *The inclusion of the water conservation provisions and Florida friendly landscaping requirements into the Land Development Regulations.*

Policy 3.3.1.3: Implement the Southwest Florida Water Management District (SWFWMD) emergency water shortage plan when necessary by implementing the appropriate watering restrictions during times of drought.

Measurement: *Implementation of water restrictions as required by SWFWMD.*

Policy 3.3.1.4 Continue to educate residents of water conservation use by providing updates in City communications.

Measurement: *Notices provided in water bills, City's website, or through local media outlets.*

Goal 3.4: The City of Punta Gorda will provide a safe and sanitary system for the collection and disposal of solid waste.

Objective 3.4.1: The City of Punta Gorda will provide a safe and efficient solid waste collection system to meet the present and projected future sanitation needs.

Policy 3.4.1.1: Continue to utilize the Zemel Road Landfill as a solid waste disposal site to meet the City's 20 year solid waste demand needs.

Measurement *The annual review of tonnage capacity remaining in the Zemel Road landfill.*

Policy 3.4.1.2: The City of Punta Gorda will continue to invest in capital equipment to for the safe and efficient collection of solid waste.

Measurement*: The number of capital equipment purchased.*

Policy 3.4.1.3: The City of Punta Gorda will meet either of the following two levels of service standards:

a. As a condition for building permit or development order issuance, the necessary solid waste facilities and services will be in place and available to serve that new development prior to the issuance of a certificate of occupancy; or
b. As a condition of building permit or development order issuance, the necessary solid waste facilities and services are guaranteed to be in place and available to serve that new development prior to the issuance of a certificate of occupancy. This guarantee may be in the form of an enforceable Development Agreement, adopted pursuant to Section 163.3220, *Florida Statutes*, or an Agreement or Development Order issued pursuant to Chapter 380, *Florida Statutes*.

***Measurement**: The number of building permits or development orders approved annually.*

Goal 3.5: The City of Punta Gorda will continue to participate in a county-wide recycling and waste diversion program which will result in a reduction of the amount waste disposed of at Zemel Road Landfill by at least thirty percent (30%).

Objective 3.5.1: The City of Punta Gorda will continue to encourage increased participation in recycling programs.

Policy 3.5.1.1: Punta Gorda will continue to assess of its recycling efforts and continue to develop programs to reduce the volumes of solid waste taken to the landfill. These programs may include, but are not limited to, curb-side recycling in single-family areas; multi-family and commercial recycling programs, as well as programs to collect and dispose of special wastes such as oil, batteries, and paint. The basis for the recycling program shall continue to be:

a. A City waste removal service that can dispose of 5.0 pounds of solid waste per resident per day, excluding recycled materials.
b. A City waste removal service that can provide for the recycling of 2.2 pounds of recyclables per resident per day.
c. A City waste removal service that can remove all yard waste to an appropriate shredding, milling or similar operation.

***Measurement:** The completion of a comprehensive report on recycled waste and the implementation of its recommendations.*

Policy 3.5.1.2: Punta Gorda will maintain or enhance the per capita amount of solid wastes and yard wastes recycled or otherwise not deposited in the landfill.

Measurement: *An annual report of recycled waste*

Policy 3.4.1.3: The City of Punta Gorda will increase the number of recyclable containers to its' customers to increase the amount of recycling material collected.

Measurement: *The increase in recyclable containers used in the program and the amount of material collected annually.*

Policy 3.5.1.4: The City will continue to comply with and exceed the County's adjusted recycling ceiling rates placed on specified categories.

Measurement*: The weight of the recyclables collected annually compared to the annual landfill tonnage.*

Policy 3.5.1.5: Punta Gorda will continue its public education programs to encourage residents and businesses in the City to participate in recycling efforts.

Measurement: *The number of public information messages on solid waste recycling provided to City residents and businesses.*

Policy 3.5.1.6: The City of Punta Gorda will institute a program to purchase products made with recycled materials when the purchases are cost effective.

Measurement: *The number of products purchased by the City made with recycled products.*

Objective 3.5.2: Punta Gorda will support Charlotte County efforts to increase the capacity of the Zemel Road Landfill site or transfer station sites

Policy 3.5.2.1.: Punta Gorda will support Charlotte County efforts to increase the capacity of the Zemel Road Landfill site or transfer station sites through the existing financing mechanism.

Measurement: *The annual amount of City taxes paid in support of the County landfill.*

Goal 3.6: The City of Punta Gorda will ensure the safe and efficient hazard waste collection and disposal system to meet the present and projected future needs.

Objective 3.6.1: The City of Punta Gorda will continue to encourage increased participation in hazard waste collection programs.

Policy 3.6.1.1: The City of Punta Gorda will continue to encourage residents and businesses to

participate in the County's hazardous waste programs.

Measurement: *The number of informational products distributed to the residents and businesses regarding hazardous waste programs.*

Policy 3.6.1.2: The City of Punta Gorda will continue to educate the residents regarding the Charlotte County drop off stations and their collection methods.

Measurement*: The number of educational brochures and announcements distributed to the City's residents.*

Goal 3.7: The City of Punta Gorda will provide a safe, efficient and cost effective stormwater management system which will improve and preserve the manmade and natural drainage systems, minimize the effects of non-point sources on the Charlotte Harbor Estuary and reduce the flooding problems in the community.

Objective 3.7.1: The City of Punta Gorda will provide a safe, efficient and cost effective stormwater management system to meet the present and projected future stormwater needs.

Policy 3.7.1.1: The City of Punta Gorda will develop and implement stormwater programs and practices to improve the quality and reduce the quantity of stormwater run-off before it is discharged into Charlotte Harbor and the Peace River as well as mitigate flooding of City lands.

Measurement: *The development of a Stormwater Plan for the City.*

Policy 3.7.1.2: The City of Punta Gorda will inventory stormwater structures, inventory storm related data; identify severe flooding and water quality issues; and develop a capital improvements program to implement the plan.

Measurement: *The implementation of a Stormwater Plan for the City.*

Policy 3.7.1.3: The City of Punta Gorda will continue to address stormwater quality through the implementation of the National Pollution Discharge Elimination System by:

a. Completing and implementing a Stormwater Plan.

b. Continuing to implement Best Management Practices (BMP) for stormwater management and flood control such as: streetsweeping, catch basin cleaning, swale reconstruction, annual inspection of facilities, etc. to advance water quality standards in Chapter 40-D.4, FAC or reduce flooding.

c. Continuing to require new construction and redevelopment to be covered by stormwater design requirements in 40-D.4, FAC, to meet these design requirements for water quality as specifically contained in the Basis of Review (BOR) described in Rule 40-D.4.091, FAC. For projects involving existing stormwater systems not required to be improved per the standards of 40-D.4 and involving a permit from the City's Development Review Committee (DRC), the DRC will require stormwater system improvements. (Examples of projects requiring DRC permits are expansions of cubicle content or substantial renovation of commercial structures.)

Measurement: *Progress report completed annually for maintenance to drainage facilities or structures, street sweeping, and other activities affecting stormwater.*

Policy 3.7.1.4: Punta Gorda will cooperate with Charlotte County in the development of stormwater facilities in drainage basins that overlap City boundaries.

Measurement: *Adoption of a joint agreement with Charlotte County for development of stormwater facilities that overlap jurisdictions.*

Objective 3.7.2: Punta Gorda will maintain or expand existing stormwater facilities in public rights-of-way or easements and require private and public developments to provide on site stormwater management facilities consistent with applicable regulations.

Policy 3.7.2.1: Punta Gorda will provide and maintain the City's swales and underground storm sewer systems.

Measurement*: Progress report completed annually for maintenance to drainage facilities or structures.*

Policy 3.7.2.2: Punta Gorda will provide and maintain stormwater facilities, in rights-of-way and easements, to one- and two-family structures in existing subdivisions that are exempted from current stormwater regulations as allowed by the City's annual capital improvement process.

Measurement: *Progress report completed annually for maintenance to drainage swales.*

Policy 3.7.2.3: Punta Gorda will enforce stormwater management regulations for all new development or redevelopment in accordance with methodologies approved by SWFWMD.

Measurement: *Number of DRC applications reviewed.*

Policy 3.7.2.4: Punta Gorda will continue to require developers to:

a. Provide for soil stabilization and erosion control devices during construction.
b. Provide stabilization of all stormwater facilities when completed.

c. Provide stormwater facilities that attenuate a 25-year, 24-hour design storm in accordance with SWFWMD methodologies.
d. Provide stormwater facilities such that the post development runoff rate does not exceed the pre-development runoff rate for the site. On developments that are less than two acres of impervious area and ten acres in total size, as a minimum water quality volumes shall be provided.
e. Provide certification by a professional engineer that the stormwater facilities were built according to approved plans and permits.

Measurement: *The number of DRC approvals granted requiring stormwater approvals, and number of building permits issued.*

Policy 3.7.2.5: New City Arterial and Collector Roadways shall be designed with the pavement centerline elevation at or above the design high water elevation resulting from a 25-Year frequency, 24-Hour duration rainfall event.

Measurement: *Number of new arterial and collector streets built in conformity to these requirements. Degree of conformity achieved by designed improvements to existing arterial and collector streets.*

Objective 3.7.3: Punta Gorda manages stormwater runoff through non-structural programs aimed at reducing property damage caused by flooding, improvements to water quality, and the protection of natural drainage systems

Policy 3.7.3.1: Punta Gorda will maintain or improve its classification under the National Flood Insurance Program (NFIP) Community Rating System by:

a. Acquiring additional open space in areas subject to storm damage or flooding.
b. Maintaining the City's natural drainage ways, canals, swales, retention and detention basins.
c. Maintaining programs and projects that address problems of repetitive property loss due to flooding.
d. Protecting natural drainage ways from impacts of land use and development practices on the flood mitigation characteristics of such drainage ways that may arise from sedimentation, re-directing flows, increasing potential run-off, etc.

Measurement: *The five year recertification by FEMA of the City class*

ratings and new City applications to improve its classification.

Policy 3.7.3.2: Punta Gorda will continue to implement regulations pursuant to participation in the Federal Emergency Management Agency's National Flood Insurance Flood Damage requirements that provide construction standards and minimum building elevations for new buildings and substantial improvements to existing buildings.

Measurement: *Annual number of building permits for which flood elevations and/or flood proofing is a requirement.*

Policy 3.7.3.3: Punta Gorda will continue to fund stormwater construction and maintenance programs through the general fund of the City or an alternative funding source approved by the City Council.

Measurement: *Annual Capital Improvements budget to fund stormwater and swale improvements*