

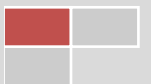
2040

# City of Punta Gorda Comprehensive Plan

#3

*Infrastructure  
Element*

Ordinance 1865-17  
April 5, 2017



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## I. EXECUTIVE SUMMARY

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: *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.

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 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 gallons per day (gpd) in 1996 to 122 gpd in 2005. Further reduction occurred in 2009 where the per capita demand was decreased to 113 gpd. It should be noted that the value in 2009 does not include treatment plant losses or water losses accrued in the aquifer storage recovery (ASR) system.

The *Potable 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. The City continues to 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 26 Article

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 Zemel Road Landfill is Charlotte County's only operational Class I landfill; it is located in South County approximately ten miles south of the City of Punta Gorda and one mile north of the Lee County line. The landfill property spans an entire section of 640 acres, and operates under a Class I permit issued by the Florida Department of Environmental Protection. It has sufficient capacity to serve Charlotte County until the year 2027, and there is ample space at the site to expand the landfill and extend its operational life well past 2050.

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 thirty-two (32) 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 to 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 onto 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 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 and 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 5. This classification results in a 25% 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 – PORTABLE WATER & 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. Potable Water projections extend to 2035. Additional projections including 2040 will be updated as the information is obtained.

### **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 & 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 documents changes from the Florida Legislature since the last update, 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.

Water supply requirements adopted previously 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

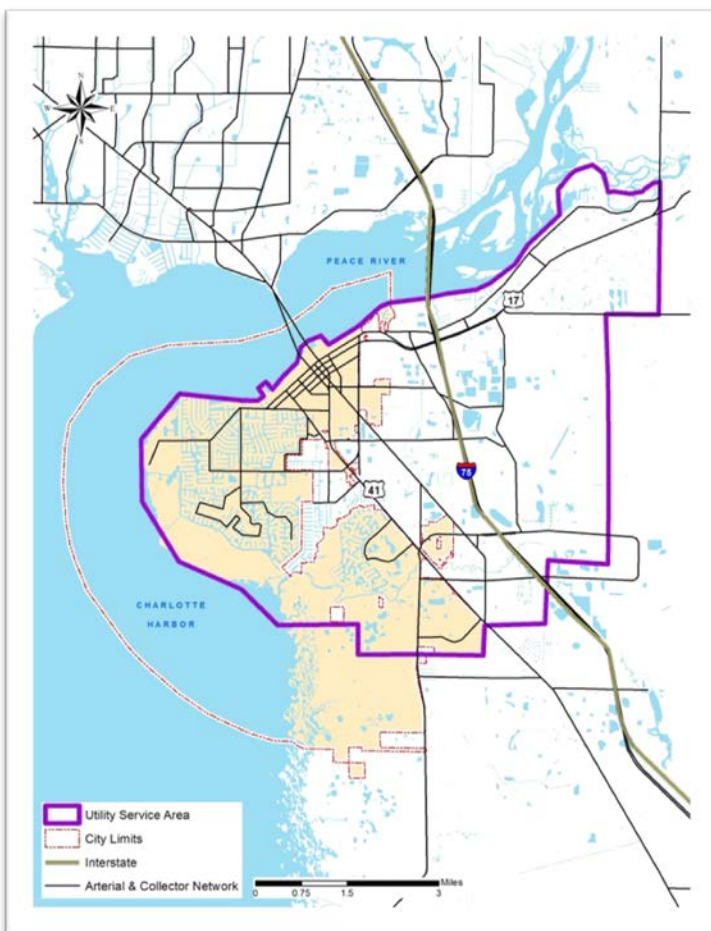
The City of Punta Gorda has adopted ordinances to provide regulation for definition of service areas, rates and fees, water emergencies, and water conservation. Ordinances relating to the City water and sewer utilities are included in Chapter 17 of the City Code of Ordinances. These ordinances regulate 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 #36 – City of Punta Gorda Utility Service Area and City Limits.



### **Map #36 - City of Punta Gorda Utility Service Area and City Limits**



### **IV. DATA AND ANALYSIS – PORTABLE WATER**

The City provides potable water to approximately 36,108 customers within the City's utility service area as shown on Map #36 - City's Utility Service Area and City Limits. 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. 20.000871.010) 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, with revisions, 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.

The City of Punta Gorda (City) developed a 10-Year Water Supply Facilities Work Plan (WSFWP) in accordance with guidelines from the Florida Department of Economic Opportunity and Section 163.3177 of Florida Statutes. The requirements of the WSFWP include:

- ❖ Update within 18 months of Southwest Florida Water Management District's (SWFWMD) board approval of the Regional Water Supply Plan (RWSP),
- ❖ Project a 10-year planning period for water supply facilities and alternative water supply needs,
- ❖ Identify projects to meet those future needs,
- ❖ Incorporate projects identified in the RWSP, and
- ❖ Identify conservation programs for potable water.

It is also required that the *Potable Water Element* and *Conservation Element* of the City's Comprehensive Plan are coordinated with the WSFWP.

#### Land Use and Water Supply Planning Linkages

City and Charlotte County zoning guidelines classify the City's utility service area land use. Map #5 Punta Gorda Future Land Use – 2040, illustrates the future land use designations within the City's utility service area. 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.

Land use based water demand projections were developed in the City of Punta Gorda Water and Wastewater Master Plan (Carollo, 2008). Future build-out percentages for the 5-year and estimated build-out year were developed based on anticipated growth and expected dates of construction of development projects within the City service area. Water demands were developed using the estimated number of developed acres within

the City's service area during each planning year, multiplied by a water use factor in gallons per minute per acre (gpm/ac). The water use factors were different for various classifications of land use such as residential, commercial, and mobile home parks, and were calculated based on actual historical usage data. The population and water demand projections were updated in the City of Punta Gorda Water Supply Master Plan Update (WSMPU) (Carollo, 2009). In 2013, the City developed an internal memorandum with revised water demand projections through 2033 using the methodology from the WSMPU while accounting for water use data through 2012.

#### Water Service Area

As identified in the City of Punta Gorda 2015 Water Supply Study Final Report provides water service to approximately 36,108 residents within the City's water utility service area. Water is withdrawn from Shell Creek Reservoir, and the raw water is pumped to and treated at the Shell Creek Water Treatment Plant (WTP). 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, hospital, and the Charlotte County jail. Industrial uses are minimal in the City's service area. Based on the City of Punta Gorda 2015 Water Audit, the total water use was distributed as follows:

- ❖ 69.84% residential
- ❖ 13.03% commercial/industrial/institutional

- ❖ 5.76% recreation/aesthetic
- ❖ 6.5% fire protection and other accounted uses, and
- ❖ 9.40% water loss

### Potable Water Planning Studies and Efforts

Due to the stressed state of natural groundwater resources in southwest Florida, there is an ever-increasing difficulty in identifying economical water supply sources that will receive regulatory approval and community support. The City is continuously developing studies and a number of planning efforts have been undertaken to develop the most reliable, cost-effective strategies to supply 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 Study in 2015 (Carollo)
- ❖ Water Supply Master Plan Update in 2009 (Carollo)
- ❖ Water and Wastewater Master Plans in 2008 (Carollo)
- ❖ Water Supply Master Plan in 2006 (Carollo)
- ❖ Reuse Feasibility Study in 2008
- ❖ City of Punta Gorda 2015 Public Supply Annual Report
- ❖ City of Punta Gorda Capital Improvements Program Fiscal Year 2016 -2020

These reports are comprehensive planning documents that include water demand projections, examination of existing water supply sources, information on facility capacities, analyses of future water supply alternatives and funding schedules.

### Existing Water Supply System

The following sections describe the City's water supply sources, treatment processes, and WTP and distribution infrastructure.

### ***Water Supply Sources***

Currently, the City uses surface water as the main raw water source for potable water supply. During low flow periods from the surface water source, the City uses aquifer storage recovery (ASR) wells as an alternative water supply. A pipeline connection to the regional system became operational in October 2012 and offers access to regional sources during emergency conditions. Further discussion of the City's water supply sources are provided in the following sections.

### Surface Water

The Shell Creek Reservoir is the primary potable water supply for the City's water system. This in-stream impoundment was created by the construction of Hendrickson Dam in 1965 and it receives water from Shell and Prairie Creeks. The Shell Creek system is included as a regional source in the SWFWMD 2015 Regional Water Supply Plan (RWSP) for the Southern Planning Region. The in-stream reservoir provides the City with water supply for treatment at the Shell Creek WTP. Improvements to the

dam embankments and downstream creek bed were completed along with replacement of the spillway in 2010 to ensure continued reliable operation and safety.

The City operates under the Individual Water Use Permit (WUD) No. 20.000871.010 issued by SWFWMD with expiration on July 31, 2027. This permit 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 SWFWMD 2015 RWSP for the Southern Planning Region shows that sufficient alternative water sources (sources other than fresh groundwater from the Upper Floridan aquifer [UFA]) exist to meet future demands and replace some of the current fresh groundwater withdrawals causing hydrologic stress.

Shell Creek currently experiences elevated levels of total dissolved solids (TDS), which creates water quality limitations in the raw water source. The TDS concentrations were found to be highly variable and seasonal. The months of August, September, and October typically have the lowest TDS concentrations throughout the year, with average TDS concentration less than 400 milligrams per liter (mg/L). Higher TDS concentrations are found during the months of April, May, and June with concentrations higher than 550 mg/L.

#### Potential Impacts of Shell Creek Minimum Flow and Levels (MFL)

In April 2010, SWFWMD published the Proposed Minimum Flows and Levels for the Lower Peace River and Shell Creek. SWFWMD

developed the MFLs based on the percent-of flow method, which determines the minimum flows for the Lower Peace River and Shell Creek.

Shell Creek, located in Charlotte County in the SWUCA, was impounded in the mid-1960s to create a reservoir to supply drinking water to the City of Punta Gorda. Minimum flows have not been adopted for Shell Creek. If it is determined that minimum flows in Shell Creek are not being met when adopted, a recovery strategy will be required. The quantity of water needed for restoration will be determined once minimum flow studies for Shell Creek have been completed.

#### Groundwater

A preliminary assessment was included in the City's 2009 WSMPU to evaluate the feasibility of developing brackish groundwater as a future water source. The evaluation was performed for a raw water quantity up to 8.75 mgd on an annual average basis and 11.25 mgd on a maximum monthly basis. Analyses concluded that the use of brackish groundwater as a raw water source for potable water has significant potential and will require RO treatment to meet public water supply standards. The City has completed preliminary design for a new RO treatment plant and anticipates bringing this new facility online in the last quarter of 2019.

#### Aquifer Storage and Recovery

The City has two operational ASR wells that can be used to provide additional water supply. The City uses its ASR wells to

supplement raw 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 water demand; therefore, the City uses recovered ASR water to supplement water from the reservoir. The City has a current permit until 2019.

The City plans to take the ASR wells offline after construction of the new brackish groundwater RO plant due to water quality limitations of the recovered water. Once the ASR wells are taken offline, the City will attempt to convert them to groundwater production wells for use at the new RO plant.

#### Emergency Capacity

The Peace River Manasota Regional Water Supply Authority (PRMRWSA) is developing the Regional Integrated Loop System, which is a series of transmission lines that transfer potable water within the PRMRWSA service area. The Phase 1 of this project recently was completed and included the construction of a 9-mile, 24-inch interconnecting pipe between the City and PRMRWSA, as well as a 0.5 million gallon (MG) storage tank and 6 mgd pump station. This interconnecting pipe represents an additional water supply for the City of Punta Gorda in the event of an emergency or other need and enables the regional supply to the City and the City supply to the region.

#### Raw Pump Stations

The Shell Creek raw water pump station is comprised of three pumps. Raw water pumps RW-1 and RW-3 each have an individual pumping capacity of 6.3 mgd, and when operating these two pumps in parallel the pumping capacity is 10 mgd. Raw water pump RW- 2 has a capacity of 6.5 mgd. Pump RW-2 is normally not operated in combination with RW-1 or RW-3. The City is planning a project in 2016-2017 that will upgrade the raw water pump station and replace the existing pumps with three pumps of equal size.

#### Water Treatment Facilities

Raw water withdrawn from the Shell Creek Reservoir is treated at the Shell Creek WTP, located east of Interstate-75 on Washington Loop Road. The City's WTP is permitted by Florida Department of Environmental Protection (FDEP) for 10 mgd of treatment capacity.

The Shell Creek WTP is a surface water treatment facility. The treatment processes utilized are 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 since its original construction date.

#### Booster Pump Stations

After treatment, finished water is pumped from the WTP to the distribution system for delivery to customers. The distribution system includes one booster pump station, the Bal Harbor

Booster Pump Station, located at the intersection of Aqui Esta Drive and Bal Harbor Boulevard. This pump station has two pumps in service and a total pumping capacity of 3,900 gpm.

Potable Water Storage Facilities

Storage facilities include storage at the WTP and two remote finished water storage tanks. The current storage capacity of the water system consists of 3.86 MG of ground storage at the WTP, a 1 MG elevated storage tank located on Burnt Store Road, and a 2 MG ground storage tank located at the Bal Harbor Booster Pump Station. Remote storage facility locations are provided for demand equalization, fire flow requirements, and emergencies.

Transmission and Distribution System

The City of Punta Gorda 10 Year Water Supply Facility Work Plan, contains a summary of existing potable water mains. However, it does not include the new 9-mile regional pipeline that crosses the Peace River and connects to the regional system.

**V. WATER DEMANDS**

The following sections describe the City’s water customers, existing and projected future water demands, level of service standards and water conservation programs

Water Customers

The City of Punta Gorda provides potable water services to customers within the City limits as well as some unincorporated areas of Charlotte County. The City’s utility service area is shown in Map #36. Table 3.1 - 2015 Average Potable Water Use summarizes the potable water distribution per land use reported in the City of Punta Gorda 2015 Water Audit.

**Table 3.1 - 2015 Average Potable Water Use**

Land Use Classification	Water Consumption (mgd)	Percent of Total Consumption (%)
Residential	3.15	69.84
Industrial/Commercial	0.59	13.03
Recreational/Aesthetic	0.26	5.79
Fire / Accounted	0.09	1.93
Unaccounted For	0.04	9.41
<b>Total</b>	<b>4.513</b>	<b>100</b>

Source: Carollo Engineers 2015

Historical Demands

Historical potable water demands increased steadily after the WTP came online in 1966. The City of Punta Gorda 10 Year Water Supply Facilities Work Plan, shows the average and peak month historical demands from 1966 through present. However the

water demand over the last ten years has remained relatively constant. The Plan also shows the annual and peak month water demand from 2003 to present. While there was a peak in 2006, the demand decreased in subsequent years and then maintained a demand of approximately 4.2 mgd from 2008 -2012. It should be noted that water demand information from 1966 to 2007 represents the raw water withdrawals (which include water treated and injected into the ASR wells that was not recovered) while the data from 2008 to present is finished water demand.

#### Current and Projected Demands

The City's 2009 WSMPU, developed water demand projections based on the SWFWMD population estimation methodology, historical water account data, and per capita water consumption. Recent growth indicators suggesting slower growth were also used to develop "slow growth" and "staged-growth" demand projections using the SWFWMD population methodology as a basis. These projections were compared with the land use based demand projections developed in the City of Punta Gorda Water and Wastewater Master Plan (Carollo, 2008). A comprehensive set of annual projections was selected in the 2009 WSMPU, based on the best available and most current information.

In 2015, City of Punta Gorda staff completed the 2015 WSMPU, an updated evaluation of the projected water demands. The City saw no growth in water demand between 2009 and 2012; therefore, the water demand projections from the City's 2009 WSMPU were adjusted to reflect recent water usage. Water demand projections for 2013 through 2035 are summarized in

Table 3.2 on an annual average, maximum month and peak day basis.

#### Selection Demand Projection Summary

The estimated water demand projected by the 10-year historical growth rate method, the linear regression method and the BEBR Low, Medium and High projection methods are compared in City of Punta Gorda 2015 Water Supply Study. The BEBR Medium method was selected as the projection method for this study. The BEBR Medium projection method has been used in previous reports for the City and was used for the SWFWMD 2015 Regional Water Supply Plan ([http://www.swfwmd.state.fl.us/files/database/site\\_file\\_sets/2675/2015\\_RWSP\\_SPR\\_GB\\_APPROVED\\_121415.pdf](http://www.swfwmd.state.fl.us/files/database/site_file_sets/2675/2015_RWSP_SPR_GB_APPROVED_121415.pdf)) as a reasonable water supply demand estimate. The TDS Blending scenarios were evaluated based on the projected populations and water demand using the BEBR medium projected method. Table 3.2 includes the 2015 to 2035 BEBR Medium Projections for the annual population and annual average, maximum month and peak day demand.

**Table 3.2 - Water Demand Projections (mgd)**

Year	Punta Gorda Service Area Population <sup>1</sup>	Average Annual Demand <sup>2</sup>	Maximum Month Demand <sup>3</sup>	Peak Day Demand <sup>4</sup>
2013 <sup>5</sup>	35,176	4.20	4.81	6.07
2014 <sup>5</sup>	35,414	4.31	5.32	6.45
2015	35,761 (35,857 actual)	4.36	5.80	7.37
2016	36,108	4.41	5.87	7.45
2017	36,455	4.45	5.92	7.52
2018	36,801	4.49	5.97	7.59
2019	37,147	4.53	6.02	7.66
2020	37,492	4.57	6.08	7.72
2021	37,803	4.61	6.13	7.79
2022	38,113	4.65	6.18	7.86
2023	38,426	4.69	6.24	7.93
2024	38,737	4.73	6.29	7.99
2025	39,047	4.76	6.33	8.04
2026	39,305	4.80	6.38	8.11
2027	39,560	4.83	6.42	8.16
2028	39,817	4.86	6.46	8.21



2029	40,072	4.89	6.50	8.26
2030	40,328	4.92	6.54	8.31
2031	40,546	4.95	6.58	8.37
2032	40,765	4.97	6.61	8.40
2033	40,985	5.00	6.65	8.45
2034	41,202	5.03	6.69	8.50
2035	41,420	5.05	6.72	8.53

Notes:

1. Based on BEBR Medium population projection growth in Charlotte County
2. Calculated using the average per capita water use amount of 122gpcd
3. Maximum 10 year maximum month PF (1.33) applied to average demand
4. Maximum 10 year peak day PF (1.69) applied to average demand
5. Actual functional populations and water demand

Source: Carollo Engineers 2015

The demand projections presented in Table 3.2 were used to conduct blending analysis for the Authority and RO projects. The BEBR Medium projections provide annual average demand, and the 10-year monthly Peaking Factors (PF's) (Table 3.3) were applied to the annual average demand for each month to estimate monthly demands.

**Table 3.3 - 10 Year Average Monthly Peaking Factors (PF's)**

Month	Peaking Factor
January	1.05
February	1.08
March	1.13
April	1.15
May	1.12
June	0.97
July	0.83
August	0.80
September	0.84
October	0.92
November	1.06
December	1.06

Source: Water Facilities Supply Plan Carollo Engineers 2015

#### Peak Water Demand Projections

Projected maximum month and peak day demands were evaluated for the City using the BEBR Medium population and

water demand projections. Future demands were estimated by applying historical 10-year maximum month and peak day PFs to the projected average daily demands.

#### Maximum Month Water Demand Projections

The 2015 Water Supply Study Final Report (Carollo 2015) identifies the maximum monthly demand and defines the average daily demand that occurs during the highest demand month within a year. Since 1966, the highest demands have occurred in May (33 percent) and April (29 percent) followed by March (10 percent). Over the last 10 and 20 years, the highest demands occurred in March and May followed by April. Demand data were not available for 2002, so the 20-year analysis extends back to 1995. The maximum monthly PF over the period of record (1966 to 2014) was 1.57 and the average was 1.29. The two highest monthly demands, 1.57 and 1.51, which occurred in May 1983 and April 2006, respectively, were excluded from the selection of the maximum PFs since these were the only PFs greater than 1.5 over the entire 49 year period of record. The maximum monthly PF was therefore 1.46 over the period of record (1966 to 2014), 1.35 over the last 20 years, and 1.33 over the last 10 years. The 10-year maximum monthly peaking factor was selected for the demand analysis. Though the monthly peaking factor has been higher, the 1.33 peaking factor better represents the most recent conditions in the distribution system.

The 10-year maximum monthly PF, 1.33, was used to project the maximum monthly demands through 2035. Table 3.2 Water Demand Projections summarizes the projected maximum monthly demands.

Discrepancies with SWFWMD Projections

SWFWMD developed population and water demand projections during the 2010 Regional Water Supply Plan Southern Planning Region Appendix 7 [http://www.swfwmd.state.fl.us/files/database/site\\_file\\_sets/2639/southern\\_planning\\_region.pdf](http://www.swfwmd.state.fl.us/files/database/site_file_sets/2639/southern_planning_region.pdf). In addition, SWFWMD has developed Community Planning Pages to assist counties and municipalities in developing comprehensive plans and 10-year water supply facilities work plans. A summary of the projected demands from SWFWMD as compared to the City's latest projections is presented in Table 3.4 – City of Punta Gorda and SWFWMD Demand Projections (mgd).

For the years 2010 and 2015 the discrepancy between the demands projected by the two entities can be explained by the timing, data, and methods used in calculating the demands. The City of Punta Gorda projections were developed using the staged-growth projection. This methodology uses two growth periods: (1) Slow growth (1.3 percent growth rate) from 2013 to 2017 and (2) average growth (2.9 percent growth rate) thereafter until 2033. The projected water demand is calculated using the average water demand from 2012 plus the BEBR Medium selected average annual growth rate of 0.75% as shown in Figure 3.1- Annual Average Demand Projection Comparison as shown in the City of Punta Gorda 2015 Water Supply Study Final Report.

**Table 3.4 - City of Punta Gorda and SWFWMD Demand Projections (mgd)**

Year	City of Punta Gorda	SWFWMD
2010	4.30 (actual)	5.41
2015	4.41	5.95
2020	4.94	6.57
2025	5.70	7.15
2030	6.57	7.55

Source: Carollo Engineers 2013

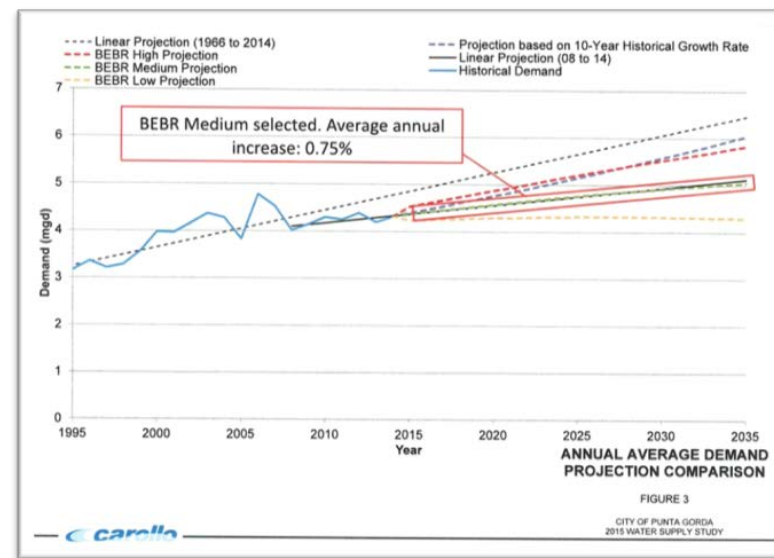


Figure 3.1 – Annual Average Demand Projection Comparison

## VI. LEVEL OF SERVICE STANDARDS & CONCURRENCY

Level of service (LOS) standards and concurrency in the City are adopted in this Comprehensive Plan. The LOS standards are implemented to meet water demands and assure water quality regulatory compliance. Potable water demands are expressed in terms of average daily demands, values that must be met on a regular basis without stressing the WTP or distribution system. In addition, the City must be able to treat and deliver water during occasional periods of peak demand without exceeding water infrastructure capacities. Peak demands are met by combining treatment plant capacity, distribution system storage and pumping facilities.

The City has recently updated its 2015 LOS requirements to 126 gpcd per person, or 249 gallons per equivalent residential units (ERUs) based on an occupancy factor of 1.98 persons per household (per 2010 Census data). The current LOS standards were determined assuming the continued use of the ASR wells. These standards will be modified to 125 gallons per person per day or 248 gallons per ERU per day, once the ASR wells are taken offline or converted into production wells. In addition, the LOS standard for water transmission capabilities requires at least 40 pounds per square inch (psi) of pressure to be maintained in the distribution system at peak hour conditions.

Concurrency management was established to ensure that new development will not reduce the City's utility services to below the established LOS. The City's procedures to request water

service connections are outlined in Chapter 26 Article 16 of the City Code of Ordinances.

### Water Conservation

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 implementation of conservation measures by the City has continually decreased the per capita demand factor from 145 in 1990, to 135 in 1996, to 122 in 2005. Currently the City has further decreased the per capita demand the per capita demand factor to 113 in 2009. It should be noted that the value in 2009 does not include treatment plant losses or water losses accrued in the ASR system.

Although the City is pleased with its water conservation efforts and decrease in per capita water demand over the past decades, 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 Water Conservation Practices**

### Tiered Water Rate Structure

The City currently has a moderately tiered rate structure based on consumption. The Inverted Block Rate structure used by the City encourages customers to use less water. In addition, City residents pay a different rate than customers outside of City limits. The billing structure including monthly changes, are described in Chapter 17 of the City's Code of Ordinances, and it is divided in the following 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

### City Ordinances

The City has implemented several water conservation ordinances.

- ❖ All new water service equipment or fixtures need to meet the requirements specified in the Building Code.
- ❖ Blowout type toilets and urinals shall be replaced with like-type fixtures.
- ❖ Watering restrictions - allows lawn irrigation two days per week. During times of water shortages, more stringent watering restrictions may be enforced based on the severity of the water shortage event and SWFWMD Water

Shortage Plan. Violation of watering restrictions is penalized by the City.

- ❖ Chapter 26 Article 12 of the City's Code of Ordinances indicates that artificial turf may be considered as an alternative to grass and groundcover. In addition, the Code requires the use of trees and shrubs that are native southern Florida species and a percent of these must be drought-tolerant species. These modifications to the City's Code allows for reduction in 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 Water Conservation Practices**

Some of the conservation measures that have been considered by the City and/or may be evaluated again in the future include the following: a more aggressive rate structure, additional public education and outreach, ordinances requiring water conserving architecture and landscaping, plumbing and fixture rebates and retrofits, and special educational programs for high water use customers.

### New Rate Structure

The City determined a need to increase its monthly water rates, fees, and charges to help fund future water supply projects. As a result, a steeper inclining block rate structure was implemented. In 2008, the cost differential between the lowest and highest block of water use (less than 10,000 and more than 80,000 gallons per month, respectively) was \$1.62 per 1,000 gallons consumed. The new 2015 water rates include a \$3.45 differential between the lowest and highest water usage blocks. A decrease in water demand is anticipated as a result of the new rate structure

### Education and Outreach Programs

The City has previously published a flyer which highlights the benefits and importance of conservation. This flyer is available on the City's website and the Utility Department office. The City is considering making this an on-going program. In addition, all customers receive annual consumer confidence report (CCR) where the City also includes information regarding water conservation.

### 'Green' Architecture/Florida-Friendly Landscaping

The City will continue to 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.

Some of the conservation measures that have been considered by the City and/or may be evaluated again in the future include the following: a more aggressive rate structure, additional public education and outreach, ordinances requiring water conserving architecture and landscaping, plumbing and fixture rebates and retrofits, and special educational programs for high water use customers.

## **VII. SUMMARY OF WATER DEMANDS, FACILITY CAPACITY, & PERMITS**

Table 3.5 provides a summary of water demands, facility capacity, and permitted quantities for the City's supplies and WTP. The annual average and peak supply for Shell Creek are based on the City's WUP through 2027.

The City's WUP was issued in 2007 with a minor modification in 2011 and does not include requirements outlined in the proposed Shell Creek MFLs. The WUP is subject to modifications to comply with the MFL requirements if/when they are established. MFL regulations will likely reduce the allowable withdrawal during the low flow conditions and will require the addition of an alternate water source to meet water demands. This alternative source will be brackish groundwater with treatment at a new RO facility. The new treatment facility will be brought online by approximately 2019 to aid in meeting proposed MFL regulations, improve blended water quality, and meet projected peak day water demands.

**Table 3.5 - Summary of Water Demands, Facility Capacity, and Permits**

Year	2018	2023	2027
Average Daily Demand (mgd) <sup>1</sup>	4.49	4.69	4.83
Peak Day Demand (mgd)	7.63	7.97	8.21
Available WTP Capacity (mgd)	10.00	13.00	13.00
New RO WTP Capacity (mgd) <sup>2</sup>	-	3.0	3.0
Facility Capacity Surplus (mgd) <sup>3</sup>	5.51	5.31	4.25
Annual Average Permitted Quantity (Shell Creek) <sup>4</sup> (mgd)	8.09	8.09	8.09
Annual Average Permitted Quantity (Groundwater) <sup>5</sup> (mgd)	-	5.0	5.0
Annual Average Permitted Surplus <sup>6</sup> (mgd)	3.43	8.40	8.26

Notes:

1. Based on water demand projections developed by City staff in 2013.
2. A new RO treatment facility will be brought online by approximately 2019 to provide additional treatment to improve blended water quality and meet peak day demands.
3. Calculated by subtracting Water Demand from Total WTP Treatment Capacity.
4. Current WUP expires in 2027.
5. Quantity of permitted groundwater for new RO facility is unknown at this time but is estimated at 5.0 mgd in order to provide rotational groundwater capacity.
6. Calculated by subtracting Water Demand from Total Supply.

Source: Carollo Engineers 2015

Projections show the current surface water supply, additional future brackish groundwater supply, and projected demand over time during a 15-year planning period. The projected demand in this represents annual average and peak demand based on the projections in Table 3.2. The water demand through a 10-year period is well below current and proposed future supplies.

### VIII. ALTERNATIVE PORTABLE AND REUSE WATER SUPPLY, TREATMENT, & DISTRIBUTION PROJECTS

Development of new water supplies will be compatible with the 2010 Regional Water Supply Plan Southern Planning Region. The following sections describe various projects identified for future potable water and reclaimed water supplies, treatment, and distribution.

#### SWFWMD RWSP

The following projects were identified in the 2010 Regional Water Supply Plan Southern Planning Region as located within the City's utility area jurisdiction. The projects are summarized by category along with the City's plans for developing them.

#### Surface Water

The 2010 Regional Water Supply Plan Southern Planning Region, identifies the Shell/Prairie Creek Public Supply project, which consists of a new intake structure, raw water pumping station,

new treatment facilities and associated piping, and an off-stream reservoir with a capacity of 6 billion gallons (BG) of raw water storage to capture additional water from the Shell/Prairie Creek system. The 6 mile regional interconnection between the City of Punta Gorda and the Peace River Facility could be used to transfer the additional water supply to other utilities in the region.

The City however is proceeding with an RO facility project to improve finished water TDS concentrations to help to comply with the anticipated MFL regulations, and meet its future peak demands. While the Shell/Prairie Creek Project has been identified by the SWFWMD and the PRMRWSA, the City began the final design, permitting and construction in April 2014 with anticipated completion of the RO facility in the 4<sup>th</sup> quarter of 2019.

Conjunctive use evaluations were performed to assess the use of groundwater to supplement surface water supply during dry weather conditions. These evaluations were performed to identify ways to reduce the cost of facilities and improve water quality and reliability. There are three options listed in the 2010 SWFWMD RWSP; however, the Shell/Prairie Creek Public Water Supply project described above is the one that directly affects the City of Punta Gorda.

The development of a conjunctive use groundwater source will improve the City's water supply yield, quality, and reliability. This will be accomplished through the City's RO treatment plant project.

### Interconnect/Improvements

The City of Punta Gorda potable water system has been recently interconnected to the PRMRWSA system. This interconnect consists of a 9 mile pipeline from the Shell Creek WTP to the PRMRWSA system. This interconnect is the initial phase of the Regional Integrated Loop System developed by the PRMRWSA, which includes a series of transmission pipelines to transfer water regionally. In addition, the 2010 Regional Water Supply Plan Southern Planning Region identifies the following interconnect project:

- ❖ Interconnect between the potable water systems of Charlotte County and the City of Punta Gorda.

The City currently has no direct connections with Charlotte County, but it connected indirectly through the new PRMRWSA pipeline. The City currently does not have plans to construct a direct interconnect with Charlotte County.

### Reclaimed Water

In 2014 the City updated the 2007 Reuse Feasibility Study to evaluate the technical and fiscal considerations of implementing a reclaimed water system. Due to the elevated nature of TDS in the City's raw water supply, as well as the presence of brackish groundwater infiltration into the wastewater collection system in some coastal areas, the TDS and chloride concentration of the City's wastewater makes it infeasible to establish a reclaimed water system at this time. The City continually makes improvements to its collection system to decrease brackish



groundwater infiltration to decrease the wastewater chloride concentration to move towards the goal of a reclaimed water system.

#### Brackish Groundwater

The City is designing and constructing a 4-mgd RO water treatment facility to treat brackish groundwater and to increase its treatment capabilities to meet future water demands, improves blended finished water quality, and comply with meeting anticipated MFL regulations during low flow periods in Shell Creek. An evaluation of this alternative is presented in the 2015 WSMPU. The implementation of the RO facility will require a modification of the existing WUP or a new groundwater WUP to add the new wells. In addition, the development of a wellfield management strategy will address potential changes in source water quality over time.

#### Conservation

The 2010 Regional Water Supply Plan Southern Planning Region identifies several suggested conservation programs that various utilities can implement. The City of Punta Gorda has several water conservation programs and plans already in place, as discussed previously.

#### PRMRWSA Integrated Regional Water Supply Master Plan

The PRMRWSA's Integrated Regional Water Supply Master Plan summarizes projects that will affect the City of Punta Gorda. This Master Plan includes the interconnecting pipe described in

Section 5.1.2. As described previously, this pipe allows the transfer of finished water between the Peace River Facility and the City's water distribution system.

#### City of Punta Gorda CIP

The City of Punta Gorda fiscal year 2016-2020 Capital Improvements Program (CIP) contains potable water projects budgeted for the next five years. The projects include improvements to the potable supply, distribution, treatment, and renewal and replacement (R&R) projects. Detailed descriptions of all proposed CIP projects with a capital cost equal or greater than \$100,000 are included in Appendix #6 - City of Punta Gorda Capital Improvement Program, Debt Service Obligations, & Project Total Expenditures.

## **IX. 10 YEAR WORK PLAN**

The City of Punta Gorda 10-Year Water Supply Facilities Work Plan includes projects from the current CIP. The 5-year CIP has approximately \$4.0 million in capital projects planned for potable water.

In addition, an alternative water supply project, which includes a new groundwater source and the RO plant, is identified in the CIP. However, no budget has yet been assigned to this project as the City is looking into different funding alternatives. No significant new projects are anticipated for the potable water supply during the period of 2019 to 2023. The approved CIP for fiscal years 2016-2020 is provided in Appendix #6 - City of

Punta Gorda Capital Improvement Program, Debt Service Obligations, & Project Total Expenditures.

As shown in the City's CIP, the City is committed to maintain its water distribution system infrastructure, replace aging infrastructure, and increase reliability through looping and increased diameter pipelines for additional capacity.

The City plans to continue to utilize its existing 10 mgd Shell Creek WTP, which will satisfy the City's projected peak day demand through approximately 2035. Concurrently, the City will continue with the implementation of water conservation practices to reduce future water demands and will also continue to take steps to work towards meeting their reuse goal.

Finally, the City plans to increase its water treatment capacity with the addition of a 4-mgd RO facility. This facility will be used along with the existing WTP to comply with the MFL regulations and meet future water demands and TDS standards. Currently, no budget has been assigned to this project in the CIP as the City is looking into different funding alternatives.

## **X. CONCLUSION**

The City has developed a 10-Year Water Supply Facilities Work Plan to document information needed for the City's Comprehensive Plan. This document will continue to be updated for future Comprehensive Plans.

The City of Punta Gorda water service area serves approximately 36,000 customers. The largest water demand within the service area comes from residential users that represent approximate 72 percent of the water consumption. The second largest water demand is from commercial, industrial, and institutional users; the water consumption from this group is approximately 12 percent (12%). The remaining percentage is distributed between recreational/aesthetics, fire protection and other accounted uses, and water loss.

The City currently uses surface water from the Shell Creek reservoir to supply potable water to the service area and has a permitted withdrawal average capacity of 8.088 mgd. SWFWMD has recently proposed MFLs for the Shell Creek, which, as proposed, will impact the City's ability to meet the water demand during low flow periods. A new emergency connection to the PRMRWSA regional water system was placed into service in October 2012. The City also is planning to add an RO facility to treat brackish groundwater in order to meet the MFL requirements as well as TDS standards.

The City's 5-year CIP (fiscal year 2016 – 2020) identifies about \$4.0 million in projects related to potable water. These projects include several water infrastructure improvements projects, permit renewals, and studies. In addition, an alternative water supply project, which includes a new groundwater source and an RO plant, was identified in the CIP. However, no budget has yet been assigned to this project as the City is looking into different funding alternatives.

The RO project as a supplemental water source for the SCF is expected to allow the City to meet water demands and the TDS standard through 2035. The Authority project could be expected to meet water demands and the TDS standard given that the SCF TDS remains at historical average values. The Authority Phase 1 pipeline project provides regional cooperation opportunities while the RO project provides confidence that the City will be able to meet the TDS standard at all times.

## **XI. DATA AND ANALYSIS - SANITARY SEWER**

The City provides wastewater service to approximately 25,450 residents within the City's utility service area. Map #36 - City of Punta Gorda Utility Service Area and City Limits, illustrates the City of Punta Gorda Wastewater 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.

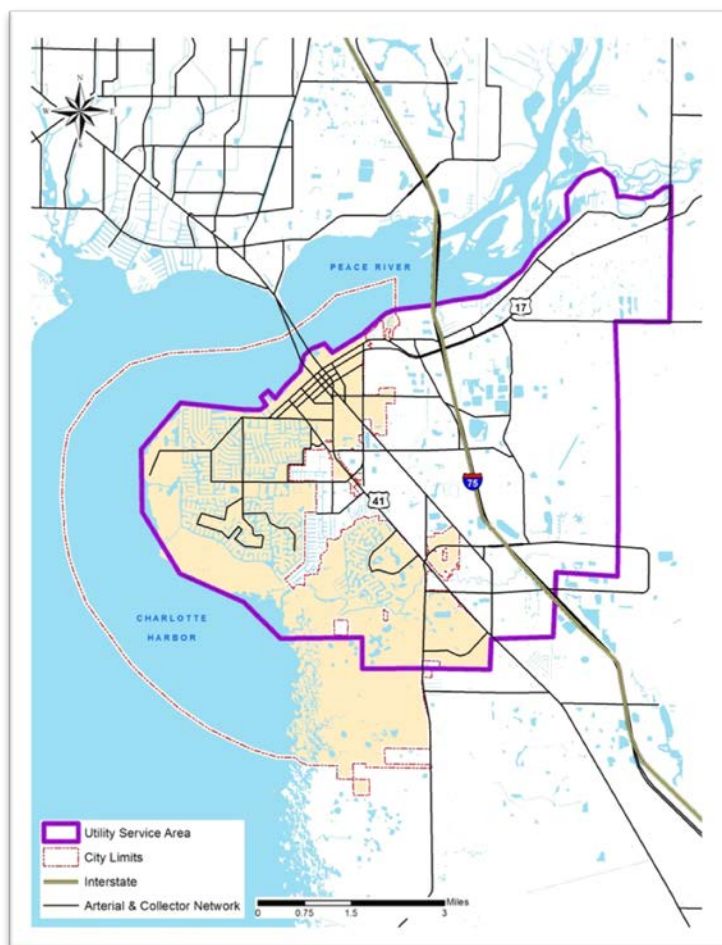
### ***Sanitary Sewer Planning Studies and Efforts***

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 2014 the City updated the 2007 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 2014 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 #36 - City of Punta Gorda Utility Service Area and City Limits



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. Results of the study address the feasibility of implementing a reuse system to treat and deliver reuse water for beneficial use as landscape irrigation water.

#### Inflow and Infiltration Study

The City annually completes 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 City of Punta Gorda Inflow and Infiltration Study annually identifies 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 City of Punta Gorda Wastewater Collection System Master Plan and hydraulic wastewater force main 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 September 21, 2019. 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. The City disposes of treated effluent by injection into a Class 1 injection well with a permitted capacity of 12 mgd. The injection well permit is renewed every five (5) years. Residuals are disposed of by land application on the WWTP site.

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	2/23/2021
FLA014067	Bay Palms MHP	25163 Marion Avenue	10,000	12/20/2020
FLA014070	Lazy Lagoon MHP	8320 Riverside Drive	70,000	10/18/2018
FLA014088	Palm & Pines Inc.	5400 Riverside Drive	15,000	12/23/2019
FLA014105	Pelican Harbor MHP	6720 Riverside Drive	20,000	3/29/2021
FLA014122	River Forest Village	4300 Riverside Drive	35,000	10/7/2017

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: FDEP Wastewater Facility List

## XII. SANITARY SEWER – LEVEL OF SERVICE

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 update 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 <sup>3</sup> (mgd)	Peak Day (mgd)
2008	2.18	3.03	6.11
2013	2.64	3.67	7.40
2018	3.49	4.85	9.78
2023	4.34	6.04	12.16
Build-out <sup>2</sup>	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

**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 Month <sup>1</sup> Flow (mgd)	3.03	3.67	4.85
WWTP 3MADF Permitted Capacity (mgd) <sup>2</sup>	4.0	4.0	7.02
WWTP Permitted Surplus (mgd) <sup>3</sup>	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. City WWTP will be expanded from 4 to 7 mgd (based on 3MADF) by 2015.

Source: verified by Utility Staff 2016

### 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.

### **XIII. 10- YEAR WORK PLAN - SANITARY SEWER**

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 and are ongoing, is provided in Table 3.9.

**Table 3.9 - Sanitary Sewer 10- Year Work Plan**

Fiscal Year	Project	Task	Funding Source
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.

## XIV.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.

## **XV. 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 Statutes. 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)***

#### 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.

## **Charlotte 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.

## **XVI. DATA AND 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 in the future as demand increases.

### 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 #37 - shows the location of the Zemel Road Landfill. It operates under a Class I permit issued by the Department of Environmental Protection (DEP). 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. According to the most recent Landfill Life Report, the Zemel Road Landfill has remaining capacity, which is deemed sufficient to serve Charlotte County until the year 2034. This is below the planning horizon of 2050, but the County has identified 170 acres within the existing 640-acre Zemel Road site for future use as disposal cells. It is estimated that these 170 additional acres will provide disposal capacity beyond the year 2050. The projection of landfill site life is based on engineering design, operational techniques, projected population, 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 Life Report is updated annually, as required by 62-701, F.A.C. This report identifies capacity based on population projections and the report estimates the remaining disposal capacity of the facility.

#### Map #37 - 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.

### 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 - 2012- 2017 Disposal Tonnage by User for the City of Punta Gorda**

	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17 Projected
<b>Residential</b>						
Total	5,714.26	5,660.05	5,473.22	5,386.28	6,381.88	6,200.00
Monthly Average	476.19	471.67	456.10	448.86	531.82	516.67
<b>Commercial</b>						
Total	3056.88	2915.73	3361.35	3671.64	3,647.52	4,300.00
Monthly Average	254.74	242.98	280.11	305.97	303.96	358.34
<b>Yard Waste</b>						
Total	2,892.14	2,952.31	2,778.09	2685.45	4,266.17	3,000.00
Monthly Average	241.01	246.03	231.51	223.79	355.51	250.00

Source: City of Punta Gorda 2016

### 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 approximately 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 Zemel Road Landfill, operated and managed by Charlotte County, has sufficient capacity to dispose of solid waste until



2035 and with future plans additional acres will provide disposal capacity beyond the year 2050.

Although the landfill and solid waste collection is sufficient to serve the City of Punta Gorda's needs for the next planning horizon, 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 expansion of the existing facility 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.

## **XVII. 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 to both the *Conservation and Coastal Management Elements* 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*.

## **XVIII. 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 Act 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 Southwest Florida Water Management District (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 Department of Environmental Protection (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/SWFWMMD 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

### Chapter 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.

### Chapter 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 were 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.

### Chapter 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

#### Department of 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.

## **XIX. 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 Florida Statutes, 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 # 19 *Conservation Element*.

### 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.

### 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 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. 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 Water 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.
- ❖ 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

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.

### **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



## XX. 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 2040 planning horizon, consistent with the Ten Year Water Supply Plan, in the most economically efficient and environmentally responsible manner.

Objective 3.1.1: City of Punta Gorda will provide a safe and effective water system to meet the present and effective water system to meet the present and projected future portable 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 continue to evaluate the technical, financial, and regulatory feasibility of a water reuse system to offset demands on the potable system.

*Measurement: The implementation of the water reuses study recommendations.*

**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 continue to upgrade the wastewater facilities as identified through the Wastewater Collection System Master Plan and other planning activities.

**Measurement:** *The implementation of the recommendations identified in the Wastewater Collection System Master Plan.*

**Policy 3.1.2.2:** Punta Gorda will continue to 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 evaluation every five (5) years as required by the SWFWMD permit.*

**Policy 3.1.2.3:** Expand the existing wastewater treatment plant when needed 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 annually to increase the technical feasibility of the development of a reuse water system.

**Measurement:** *Completion of the annual 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 update the Ten-Year Water Supply Facilities Work Plan within 18 months after the District approves updates to its Regional Water Supply Plan, pursuant to Section 163.3177(6)(c), F.S.

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

**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 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, curbside 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*