3

INFRASTRUCTURE

# Infrastructure Element

City of Punta Gorda Comprehensive Plan 2045

Ordinance XXXX

Date

# Table of Contents

# I. EXECUTIVE SUMMARY

~~The purpose of the~~The *Infrastructure Element* ~~is to~~ provide~~s~~ the policy framework~~for~~ necessary to guide the provision of public facilities and services. These provisions are calculated using ~~built directly upon correlated to~~ future land~~-~~use projections. The element is divided into three sections: P*otable Water ~~&~~ and Sanitary Sewer, Solid Waste,* and *Stormwater Management*. There are no aquifer recharge areas within ~~City~~ 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).

## Potable Water & Sanitary Sewer

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 with a focus on water quality, diversity of supply, and enhancing overall system resiliency. ~~, design, and construction.~~

Evaluation of p~~P~~otable w~~W~~ater and~~&~~ s~~S~~anitary s~~S~~ewer infrastructure needs are determined through a 10-year plan that addresses future demand~~needs~~ and requirements ~~necessary~~ in order to meet the established level of service standards. Levels of service (LOS) standards are formulated using projections of ~~set based on~~ current usage patterns ~~that can be projected forward~~ to determine the capacity requirements of~~necessary to meet~~ existing and future development. This c~~C~~omprehensive p~~P~~lan 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.

Consistent with S~~s~~tate legislation, the City's planning efforts ensure that public utilities~~,~~ are available at the time of new development. This is accomplished through the maintenance of a concurrency management system, outlined in Chapter 26, Article 16 of the *City Code of Ordinances*, which ensures that the impact of new development will not reduce the City's utility services to below the established LOS~~levels of service~~.

Another critical tool used to accommodate future growth is ~~The City considers~~ water conservation. The City ~~a~~ benefit~~s~~~~cial method to~~from increased relative system capacity through reductions in per capita water demand, as measured in gallons per day (gpd). The reduced growth rate in total water demand as a result of~~:~~ ~~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.~~ the City's water conservation efforts and the policy guidance from the Southern Water Use Caution Area (SWUCA) have decreased per capita use from 145 gallons per day (gpd) in 1990, to 133 gpd in 2020. ~~Although the City has made considerable~~While this progress in its conservation effort is significant, the City is committed to further reducing individual levels of potable water consumption. Future conservation efforts will ~~likely~~need to be more proactive, focusing ~~us~~ on education and outreach that~~to~~ increases public awareness of the benefits of water conservation.~~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 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 the capacity needs requirements 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 that addresses future needs and requirements necessary to meet the established level of service standards.

## Solid Waste

The purpose of theThe Solid Wasteis section *Solid Waste Section* is to ensureanalyzes the that necessary sanitation facilities and services are in placecurrently available to determine whetherthat provide for thecurrent needs are met and that anticipated growth can beof current and future populations in the City of Punta Gorda iscan be accommodated. The Solid Waste sSection also details the City's curbside collection and disposal processes services for solid waste, recyclables, yard waste, and hazardous waste.

The City utilizes the Charlotte County operated Zemel Road Landfill, which is the only solid waste for solid-waste disposal.operational landfill in Charlotte County. This Landfill is Charlotte County's only operational Class I landfill. Located in South Charlotte County, the facility is approximately ten miles south of the City of Punta Gorda. Spanning 640 acres, the landfill has sufficient capacity to serve Charlotte County until the year 2027. In addition to the currently certified capacity, there is ancillaryddditional space on-site to expand the landfill, extending its operational life well past 2050.

## Stormwater Management

The Zemel Road Landfill is Charlotte County's only operational Class I landfill.; it 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* ManagementThie Stormwater Managements Ssection guides the City's existing stormwater management programs and provides a framework for future programs. with minimal boundary changes since beginning with the time of Plan plan adoption; Tthe 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. Of the 32xx square miles of total land area, almost 50 percentyy percent of the land is held in conservation by various State and local

governmental entities, providing a huge ecological benefit to the cCity.

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 State and local regulations are in place to regulate moderate surface water management systems and alterations to existing surface water management systems them whichthat 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 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 sSection 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 anticipated future development on the stormwater management system, and the future future annexations within the City's Annexation study area, and the resiliency of the these systems over time due to continued sea level rise and other natural disasters. of vacant lands. The development review process, permit issuance, and level of service standards assist the City in offsetting the impact of development on the stormwater management system. The City of Punta Gorda will continue to employ those goals, objectives, and policies set forth in this element for the implementation of a comprehensive management plan.

## *II.* INTRODUCTION – POTABLE WATER AND& SANITARY SEWER

The Potable Water and Sanitary Sewer sSection is an important component of the *Infrastructure Element*. This section provides the policy framework It is necessary to support development of a reliable, cost-effective strategy for supplying potable water and sewer service, with a focus on water quality, diversity of supply, and enhancing overall system resiliency. 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.~~ pPotable wWater projections extending to 2040~~35~~. ~~Additional projections including 2040 will be updated as the information is obtained.~~

## Purpose:

The ~~purpose of the~~ Potable Water and Sanitary Sewer section ~~Infrastructure Element is to~~ identifiesy the facilities and means at the City's disposal to meet the current demand. The existing conditions and population projections are used to extrapolate future demand and whether the City has the capacity to meet its anticipated exigencies. It is the purpose of this section to outline strategies to meet all demand to the letter of LOS standards, while mitigating strain to existing environmental systems. Added weight is given to programs that bolster Punta Gorda's resilience in the face of disastrous events, promote sustainable practices of water extraction and replacement that cause limited disruption to the hydrologic cycle, and, overall, ameliorate water quality degradation. ~~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~~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 – P~~O~~RTABLE WATER AND& SANITARY SEWER

The City must construct and operate potable water and sanitary sewer facilities in accordance with all applicable federal, state, and local regulations. Most existing regulations are based on federal guidelines mandated by the United States Environmental Protection Agency (EPA). This section 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~~ chapter 403.086, *Florida Statutes*, and ~~Chapter~~ Rule 62-600, Florida Administrative Code. Separate standards for on~~-~~site sewage treatment and disposal systems are established in ~~Chapter~~ Rule 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.

## State Regulations

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~~safeguarding 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, *Florida Statutes*

In order to comply with the federal regulations for water quality, the State of Florida has adopted legislation pursuant to ~~Chapter~~ 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 Rule Chapters 62-550, 62-555, 62-699, and 64E-8 of the Florida Administrative Code.

Chapter 153, ~~Section~~ section 125.01(5), *Florida Statutes*

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

Rule 62-600, *Florida Administrative Code*

Rule 62-600, *Florida Administrative Code*, the "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 wastewater treatment (ATW) standards were deemed necessary by FDEP. It also establishes criteria for the discharge of wastewater to certain wetlands.

Senate Bill 712

The Florida Legislature's Senate Bill 712, the "Clean Waterways Act", was passed in 2020 and is now Chapter 2020-150, Laws of Florida. The bill carries a wide range of water quality protection provisions aimed at minimizing the impact of known sources of nutrient pollution and strengthening regulatory requirements. The Clean Waterways Act created the Wastewater Grant Program to construct, upgrade, or expand wastewater facilities, provide advanced wastewater treatment, and convert septic-to-sewer, and dedicated historic funding to increase alternative water supply and restore and protect Florida's springs. It dedicated funding to increase water quality monitoring and identify new ways to treat, predict, and respond to blue-green algal blooms. This bill also dedicated funding for resilience projects to protect communities

from flooding and sea level rise, red tide monitoring and cleanup, and land acquisition for the Florida Wildlife Corridor.

Executive Order 23-06

On January 10, 2023, the Governor signed executive Order 23-06 to enhance environmental protection and expedite water quality projects. Executive Order 23-06 builds off of the Clean Waterways Act by continuing to invest in water quality improvement, protecting water resources, building resilient communities, and preserving conservation lands. It expands the Wastewater Grant Program funding from septic-to-sewer conversions and advanced wastewater treatment projects to projects that address the impacts of stormwater and agricultural runoff and aging wastewater infrastructure that increases nutrient loading to surface groundwater. The order also seeks to reduce the frequency and severity of blue-green algal blooms and red tide, as well as provide expedited hurricane recovery relief and support the completion of comprehensive vulnerability assessments for all of Florida's municipalities.

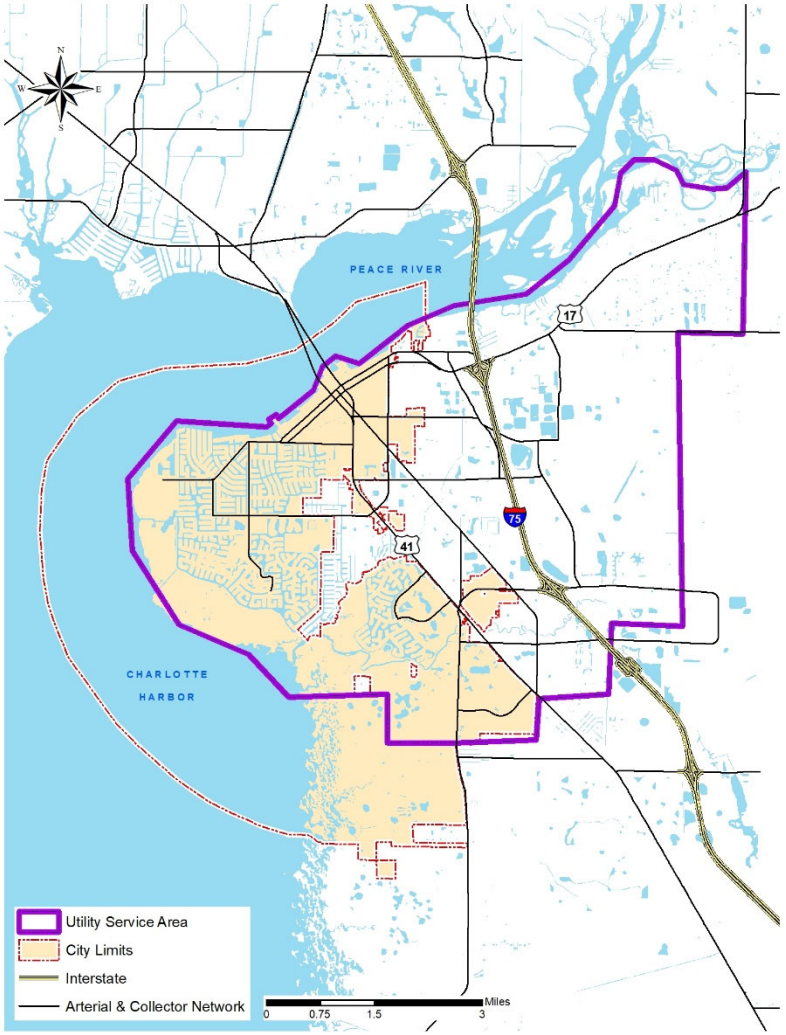
## Local Regulations

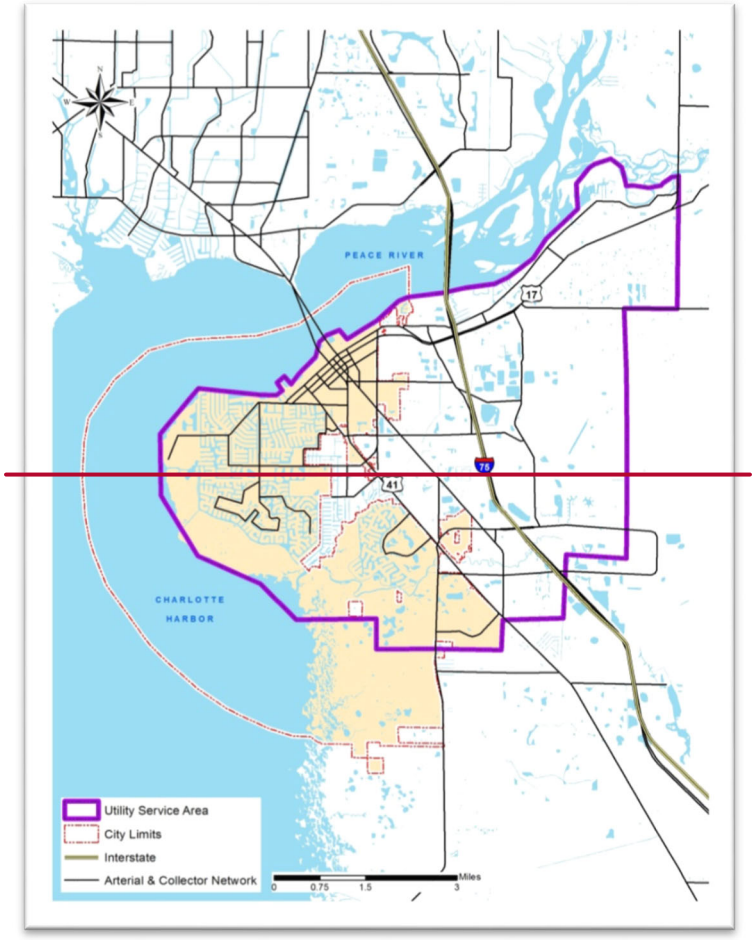
The City of Punta Gorda has adopted ordinances to provide regulation for definition of service areas, rates and fees, water emergencies, and water conservation. Ordinances relating to the City water and sewer utilities are included in Chapters 17 and 26 of the City Code of Ordinances. These ordinances 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, this ordinance 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 ~~L~~limits are shown on Map #376~~6~~ – City of Punta Gorda Utility Service Area and City Limits.

Map #3~~7~~6 - City of Punta Gorda Utility Service Area and City Limits




## *IV.* DATA AND ANALYSIS – PO~~R~~TABLE WATER

The City provides potable water to approximately ~~36,108~~39,875 customers within the City's utility service area as shown on Map #37~~6~~ - City's Utility Service Area and City Limits.

Historically, the City relied solely on the Shell Creek Reservoir for the totality of its potable water supply. Since the mid-to-late 2000s, the City has worked to diversify its water supply sources in order to increase the resiliency of its potable water supply. From 2006 to 2008, South Florida experienced a severe drought, bringing water supply diversity to the forefront of legislative concerns and prompting City Council to begin planning for a reverse osmosis (RO) facility in 2009.

Water supply is provided by two sources, surface water and brackish ground water. An additional third source is available and will be discussed later. Surface 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 also withdraws brackish ground water from a wellfield located at the WTP property and treats it at a new reverse osmosis desalination facility constructed in 2020. The City's water use permit (Permit No. 20.000871.~~010~~012) 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. These quantities include both the surface and ground water sources. The existing water use permit, ~~with revisions, was issued~~most recently modified on ~~July 31~~October 20, ~~2007~~ 2020.~~and~~ expires on July 31, 2027.

The City's Shell Creek surface WTP is permitted by Florida Department of Environmental Protection (FDEP) for 10 mgd of treatment capacity. The reverse osmosis facility is permitted for 4 mgd of treatment capacity. After treatment, water from each treatment system is combined in ground storage tanks and ~~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 – 2045~~0~~, 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.

The City regularly evaluates and updates it future water demand projections. Most recently, the City worked with a consultant and SWFWMD to review and develop water demand projections through 2040 based on anticipated population growth and historical water usage trends. These projections and the calculation methodology are described in detail in the City of Punta Gorda Review of the Proposed Lower Shell Creek Minimum Flow and Level (MFL) (Carollo, 2021). ~~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~~Public Supply Annual Report, 2020, the City provides water service to approximately 39,875~~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, other~~and~~ businesses; and institutional uses such as the County schools, hospital, and the Charlotte County ~~jail~~Jail. Industrial uses are minimal in the City's service area. Based on the ~~City of Punta Gorda 2015 Water Audit~~City's 2020 Public Supply Annual Report, the total water use was distributed as follows:

- 71.61 percent~~69.84%~~ residential,
- 11.16 percent~~13.03%~~ commercial/industrial/institutional,
- 5.23 percent~~.76%~~ recreation/aesthetic,
- 2.8 percent~~6.5%~~ fire protection and other accounted uses, and
- 9.21 percent~~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.

- Review of the Proposed Lower Shell Creek MFL in 2021 (Carollo)
- City of Punta Gorda Capital Improvements Program Fiscal Year 2016 -2020
- City of Punta Gorda 2015 Public Supply Annual Report
- Water Supply Study in 2015 (Carollo)
- Water Supply Master Plan Update (WSMPU) in 2009 (Carollo)
- Water and Wastewater Master Plans in 2008 (Carollo)
- Reuse Feasibility Study 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~~ The City uses surface water and brackish groundwater as its~~the main~~ raw water sources 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 201~~2~~3 and offers access to regional sources during peak demands and emergency conditions. Further discussion of the City's water supply sources are provided in the following sections.

### Surface Water

The Shell Creek Reservoir is one of the ~~primary~~ potable water ~~supply~~ supplies 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~~2020 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, for the two water sources combined. In 2020, the average raw water withdrawal rate was 6.376 mgd.~~.~~

The SWFWMD ~~2015~~ 2020 RWSP for the Southern Planning Region shows that sufficient alternative water sources (sources other than fresh groundwater from the Upper Floridan ~~aquifer~~ Aquifer, or ~~[~~UFA~~]~~) exist to meet future demands and replace some of the current fresh groundwater withdrawals causing hydrologic stress. The City's brackish groundwater supply is one of these alternative water sources.

As a surface water treatment facility, the Shell Creek WTP 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~~are 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.

### Raw Pump Station

The Shell Creek raw water pump station is comprised of three pumps, two duty and one standby. The pumps at the raw water intake have a capacity of 3,740 gallons per minute (gpm) and when operating two pumps in parallel the pumping capacity is approximately 10.8 MGD.

## 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. A Minimum Flow and Level (MFL) is being developed by SWFWMD to restore a more natural downstream flow. In March 2020, SWFWMD published the Proposed Minimum Flows for the Lower Peace River and Lower Shell Creek, Draft Report (SWFWMD, 2020). The report was evaluated by a peer review panel, and SWFWMD has presented the proposed MFL City Utilities staff.~~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.~~

The City retained a consultant to evaluate the potential impacts of the proposed Shell Creek MFL on the City's water supply reliability through 2040. The study determined that the City will have sufficient water supply to meet projected demands approximately 99.7 percent of the time using its own water supply sources. During peak demands and when the MFL is most restrictive, the City may need to transfer water from the Peace River Regional Water Supply Authority (PRMRWSA). The City will be working with SWFWMD to develop a modification to its WUP that will allow the MFL to be met for the next 20-year period. Additional results of the study are described in the City of Punta Gorda Review of the Proposed Lower Shell Creek Minimum Flow and Level (Carollo, 2021).

## 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 had~~s~~ significant potential and would~~ill~~ require reverse osmosis (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.~~

Over the past ten years, the City evaluated, designed, and constructed a 4 mgd RO facility to treat brackish groundwater to be blended with the Shell Creek WTP water. This 4 mgd RO facility became operational in July 2020. This has allowed the City to continue to use the Shell Creek WTP while meeting secondary drinking water standards.

## Aquifer Storage and Recovery

The City previously managed~~has~~ two operational ASR wells that ~~can~~ could be used to provide additional water supply. The City ~~uses~~ used 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. When the City elected to construct a brackish groundwater wellfield and RO treatment system, it was decided to convert the ASR wells into groundwater production wells to serve as raw water supply to the RO system. These wells were therefore converted and are now permitted as groundwater supply wells. ~~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~~)~~ developed~~is developing~~ the Regional Integrated Loop System, which is a series of transmission lines that transfer potable water within the PRMRWSA ~~service~~ regional area. ~~The~~ Phase 1A of this Regional Integrated Loop System was constructed in 2013. The Phase 1A pipeline is a ~~project recently was completed and included the construction of a~~ 9-mile, 24-inch transmission~~interconnecting~~ pipeline interconnecting a PRMRWSA distribution station in southern DeSoto County with the City of Punta Gorda's distribution system. In addition, construction of the Phase 1 pipeline was completed in 2020. The Phase 1 pipeline is a 7-mile, 24-inch transmission main connection between the PRMRWSA system and the City's WTP. ~~between the City and PRMRWSA, as well as a 0.5 million gallon (MG) storage tank and 6 mgd pump station. This~~ These interconnecting pipelines provide access to regional ~~represents an additional~~ water supply ~~for the City of Punta Gorda~~ in the event of an emergency or other need. The pipelines allow ~~and enables~~ the region~~al~~ to supply ~~to~~ the City and the City to supply ~~to~~ the region under emergency conditions.

## ~~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 surface water withdrawn from the Shell Creek Reservoir is treated at the Shell Creek WTP, located east of Interstate-75 on Washington Loop Road. The Shell Creek~~City's~~ WTP is permitted by the 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.

Brackish groundwater is withdrawn from the City's wellfield, located on the Shell Creek WTP site. Groundwater is treated with reverse osmosis and is chlorinated and blended with surface water in the finished water storage tanks. The reverse osmosis facility capacity is 4 mgd.

## 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~~5.86 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 the City's ~~existing~~ potable water pipelines ~~mains~~. ~~However, it does not include the new 9-mile regional pipeline that crosses the Peace River and connects to the regional system.~~ As of 2023, there were 269 miles of water mains, with pipe sizes ranging from 1 inch to 30 inches.

## 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 #3~~7~~6. Table 3.1 - 2020~~15~~ Average Potable Water Use summarizes the potable water distribution per land use reported in the City of Punta Gorda 2020~~15~~ Public Supply Annual Report ~~Water Audit~~.

Table 3.1 - 2020~~15~~ Average Potable Water Use

| Land Use Classification | Water Consumption (mgd) | Percent of Total Consumption (%) |
|---|---|---|
| Residential | 3.~~15~~80 | ~~69.84~~71.61 |
| Industrial/Commercial | 0.59 | ~~13.03~~11.16 |
| Recreational/Aesthetic | 0.~~26~~28 | 5.~~79~~23 |
| Fire / Accounted | 0.~~09~~15 | ~~1.93~~2.80 |
| Unaccounted For | 0.~~04~~49 | 9.~~41~~21 |
| Total | ~~4.513~~5.30 | 100 |

Source: ~~Carollo Engineers 2015~~City of Punta Gorda 2020 Public Supply Annual Report

### 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~~ 2010 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.~~ Since 2014, the City has seen steady annual increases in potable water demand, resulting in a total potable usage of 5.30 mgd in 2020.

~~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 as part of the recent proposed MFL evaluation. ~~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.~~

Peaking factors for the past five years were also calculated to determine the variation in demand for maximum month and peak day demand conditions. The peaking factor is multiplied by the annual average demand to calculate the demand for the maximum month of demand as well as for the peak day demand.

The highest maximum month peaking factor over the past five years occurred in November 2016 at 1.27. The peak day peaking factor is up to 1.5 times the annual average. These peaking factors were applied to the projected annual average demands to calculate the estimated annual average, maximum month, and peak day demand projections.

~~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. W~~The estimated population and ptable water demand projections for ~~2013~~ 2020 through ~~2035~~ 2040 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) 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 - City Water Service Area and Potable Water Demand Projections ~~(mgd)~~

| Year | Punta Gorda Service Area Population[1] | Average Annual Daily ~~Demand[2]~~ Demand (mgd) | Maximum Month Daily ~~Demand[3]~~ Demand[1] (mgd) | Peak Day ~~Demand[4]~~ Demand[2] (mgd) |
|---|---|---|---|---|
| ~~2013[5]~~2020 | ~~35,176~~39,857 | ~~4.20~~5.34 | ~~4.81~~6.58 | ~~6.07~~8.05 |
| ~~2014[5]~~2021 | ~~35,414~~40,825 | ~~4.31~~5.28 | ~~5.32~~6.71 | ~~6.45~~7.93 |
| ~~2015~~2022 | ~~35,761~~41,290 ~~(35,857 actual)~~ | ~~4.36~~5.34 | ~~5.80~~6.79 | ~~7.37~~8.02 |
| ~~2016~~2023 | ~~36,108~~41,761 | ~~4.41~~5.40 | ~~5.87~~6.86 | ~~7.45~~8.11 |
| ~~2017~~2024 | ~~36,455~~42,236 | ~~4.45~~5.47 | ~~5.92~~6.94 | ~~7.52~~8.20 |
| ~~2018~~2025 | ~~36,801~~42,717 | ~~4.49~~5.53 | ~~5.97~~7.02 | ~~7.59~~8.29 |
| ~~2019~~2026 | ~~37,147~~43,094 | ~~4.53~~5.58 | ~~6.02~~7.08 | ~~7.66~~8.37 |
| ~~2020~~2027 | ~~37,492~~43,473 | ~~4.57~~5.63 | ~~6.08~~7.15 | ~~7.72~~8.44 |
| ~~2021~~2028 | ~~37,803~~43,856 | ~~4.61~~5.68 | ~~6.13~~7.21 | ~~7.79~~8.51 |
| ~~2022~~2029 | ~~38,113~~44,242 | ~~4.65~~5.73 | ~~6.18~~7.27 | ~~7.86~~8.59 |
| ~~2023~~2030 | ~~38,426~~44,632 | ~~4.69~~5.78 | ~~6.24~~7.34 | ~~7.93~~8.66 |
| ~~2024~~2031 | ~~38,737~~44,909 | ~~4.73~~5.81 | ~~6.29~~7.38 | ~~7.99~~8.72 |
| ~~2025~~2032 | ~~39,047~~45,188 | ~~4.76~~5.85 | ~~6.33~~7.43 | ~~8.04~~8.77 |
| ~~2026~~2033 | ~~39,305~~45,468 | ~~4.80~~5.88 | ~~6.38~~7.47 | ~~8.11~~8.83 |
| ~~2027~~2034 | ~~39,560~~45,751 | ~~4.83~~5.92 | ~~6.42~~7.52 | ~~8.16~~8.88 |
| ~~2028~~2035 | ~~39,817~~46,035 | ~~4.86~~5.96 | ~~6.46~~7.57 | ~~8.21~~8.94 |
| ~~2029~~2036 | ~~40,072~~46,284 | ~~4.89~~5.99 | ~~6.50~~7.61 | ~~8.26~~8.99 |
| ~~2030~~2037 | ~~40,328~~46,534 | ~~4.92~~6.02 | ~~6.54~~7.65 | ~~8.31~~9.03 |
| ~~2031~~2038 | ~~40,546~~46,786 | ~~4.95~~6.06 | ~~6.58~~7.69 | ~~8.37~~9.08 |
| ~~2032~~2039 | ~~40,765~~47,039 | ~~4.97~~6.09 | ~~6.61~~7.73 | ~~8.40~~9.13 |

| | | | | |
|---|---|---|---|---|
| ~~2033~~2040 | ~~40,985~~47,293 | ~~5.00~~6.12 | ~~6.65~~7.77 | ~~8.45~~9.18 |
| ~~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~~

1. ~~Actual functional populations and water demand~~ Maximum month daily demand is 1.27 times the average annual daily demand.

~~5.~~2. Peak day demand is 1.5 times the annual average daily demand.

Source: Carollo Engineers ~~2015~~2021

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

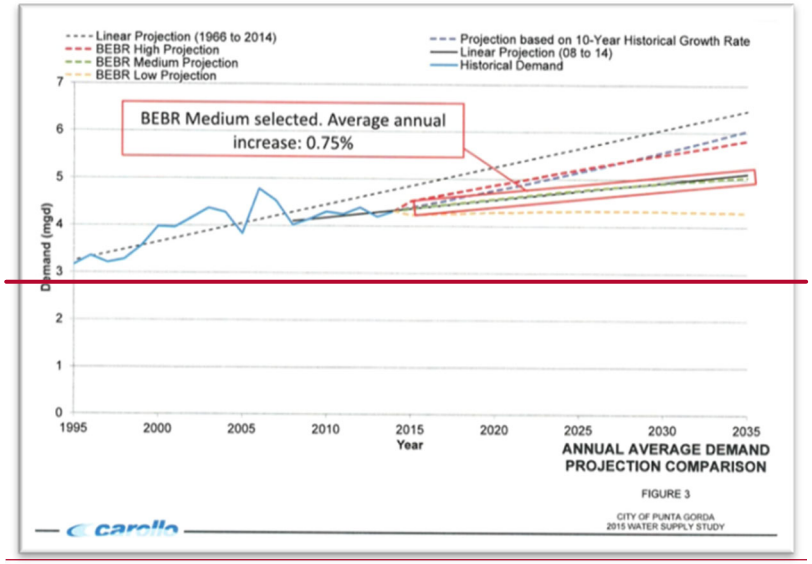
SWFWMD developed population and water demand projections during the 2010 Regional Water Supply Plan Southern Planning Region Appendix 7 http://www.swfwmd.state.fl.us/files/database/site_file_sets/2639/southern_planning_region.pdf. In addition, SWFWMD has developed Community Planning Pages to assist counties 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.

Potable water service must be available prior to the approval of any new customers or proposed development. The City's potable water ~~has recently updated its 2015~~ LOS requirement~~s~~ is to provide~~126~~ 141 gallons of potable water per day~~gpcd~~ per person, or ~~249~~ 287 gallons per equivalent residential unit~~s~~ (ERU~~s~~), on an annual

average basis.The current permitted water supply capacity is 8 MGD, with average utilization of 5.456 MGD, leaving 2.544 MGD unused. This surplus has the potential to be distributed to an additional 11,563 equivalent residential units (ERUs), assuming a 220 gpd ERU rate. 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 have continually decreased the per capita demand factor from 145 in 1990, to 135 133 in 1996, to 122 in 20052020. 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 couldplans 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 inverted Block block Rate 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 city limits. The billing structure including monthly changes, are is 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 sizecustomer charge
- 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* (Code) 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., Tand the City has continued to fund the program.

## *Future Water Conservation Practices*

The City of Punta Gorda continues to consider and evaluate additional water conservation measures in an attempt to further reduce their per capita water usage and peaks in demand. Potential conservation measures evaluated in the past include public education and outreach to counsel on the importance of conservation, implementing ordinances requiring water conserving architecture and landscaping, additional plumbing and fixture rebates and retrofits, and special educational programs for high water use customers. The City may evaluate these programs for their possible effectiveness.

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 andat 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 may discourages water conservation and recommend revisions. 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 ~~CAPASITY~~CAPACITY, & PERMITS

Table 3.~~5~~ 3 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 that expires in~~through~~ 2027.

The City's WUP was issued in 2007 with a ~~minor~~ modification in ~~2011~~ 2018 to add the City's brackish water wellfield for conjunctive use with existing surface water treatment. ~~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)[1]~~ | ~~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)[2]~~ | ~~-~~ | ~~3.0~~ | ~~3.0~~ |
| ~~Facility Capacity Surplus (mgd)[3]~~ | ~~5.51~~ | ~~5.31~~ | ~~4.25~~ |
| ~~Annual Average Permitted Quantity (Shell Creek)[4] (mgd)~~ | ~~8.09~~ | ~~8.09~~ | ~~8.09~~ |
| ~~Annual Average Permitted Quantity (Groundwater)[5] (mgd)~~ | ~~-~~ | ~~5.0~~ | ~~5.0~~ |
| ~~Annual Average Permitted Surplus[6] (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.~~
~~2. Calculated by subtracting Water Demand from Total WTP Treatment Capacity.~~
~~2. Current WUP expires in 2027.~~
~~2. 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.~~
~~2. Calculated by subtracting Water Demand from Total Supply.~~
~~Source: Carollo Engineers 2015~~

Table 3.3 – Summary of Water Demands, Facility Capacity and Permits

| | Actual | Projected | | |
|---|---|---|---|---|
| Year | 2020 | 2025 | 2030 | 2040 |
| Annual Average Demand (mgd) | 5.34 | 5.53 | 5.78 | 6.12 |
| Annual Average Permitted Quantity (mgd) | 8.088 | 8.088 | 8.088 | 8.088 |
| Annual Average Permitted Surplus (mgd) | 2.748 | 2.558 | 2.308 | 1.968 |
| Peak Day Demand (mgd) | 8.05 | 8.29 | 8.66 | 9.18 |
| Available WTP Capacity (mgd) | 14.00 | 14.00 | 14.00 | 14.00 |
| WTP Capacity Surplus (mgd) | 5.95 | 5.71 | 5.34 | 4.82 |

Projections ~~show~~ demonstrate that the current surface water and groundwater supplies~~y, additional future brackish groundwater supply, and~~ will meet the City's projected demand over time during a 20~~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 PO~~R~~TABLE AND REUSE WATER SUPPLY, TREAT~~E~~MENT, & DISTRIBUTION PROJECTS

Development of new water supplies and regional transmission projects have been~~will be~~ compatible with the ~~2010~~ 2020 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~~ 2020 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 or addressing them.

### Surface Water

The 2020 Regional Water Supply Plan identifies Shell Creek as an existing water supply for the City of Punta Gorda. The Plan also suggests that an additional 14.4 mgd may be available from Shell Creek. However, this flow is seasonal in nature and may require an additional reservoir to support reliable water supply during times of low rain fall or drought. In addition, proposed MFL regulations will further decrease available withdrawals during dry periods. The City does not plan to expand its use of the Shell Creek surface water supply during the current planning period.

~~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 4th 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.~~

Interconnect Improvements

The PRMRWSA has developed the Regional Integrated Loop System, which is a series of transmission lines that transfer potable water within the PRMRWSA. Phase 1A of the Regional Integrated Loop System was constructed in 2013. The Phase 1A pipeline is a 9-mile, 24-inch transmission pipeline interconnecting a PRMRWSA distribution station in southern DeSoto County with the City of Punta Gorda's distribution system.

In addition, construction of the Phase 1 pipeline was completed in 2020. The Phase 1 pipeline is a 7-mile, 24-inch transmission main connection between the PRMRWSA system and the City's WTP. These interconnecting pipelines provide access to regional water supply in the event of an emergency or other unforeseen circumstance. The pipelines allow the region to supply the City and the City to supply to the region under emergency conditions.

~~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.~~

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, which decreases the wastewater chloride concentration, in an effort to move towards the goal of a reclaimed water system.

Brackish Groundwater

The 2020 Regional Water Supply Plan identifies the City's new brackish groundwater wellfield and RO treatment facility. This facility was constructed with cooperative funding from SWFWMD and was brought online in 2020.~~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~~ 2020 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.

Advanced Wastewater Treatment

Even though reclaimed water is a beneficial resource, its distribution is limited. Some watersheds, such as those designated by the FDEP as laying within a basin management action plan (BMAP), cannot accept reclaimed water unless it has been given advanced treatment. Processing water with advance wastewater treatment (AWT) makes it safer to discharge into fresh and saline water bodies in case of excess production. Water reclamation facilities can treat their water to federal and state standards in a variety of ways, which the City may consider implementing in lieu of a cost-benefit analysis. Should the waters surrounding Punta Gorda become part of a BMAP, or industrial or agricultural water supply demand increase, funding AWT may become politically and financially feasible.

~~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.~~

## ~~XIII.~~IX. 10-YEAR WORK PLAN

The City of Punta Gorda 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 projects. Detailed descriptions of all proposed CIP projects with a capital cost equal or greater than $100,000 are included in Appendix #5 - City of Punta Gorda Capital Improvement & Capital Outlay Programs.

~~The City of Punta Gorda 10-Year Water Supply Facilities Work Plan includes projects from the current CIP.~~ The 5-year CIP identifies~~has~~ approximately $154.0 million in capital projects planned for potable water.

These projects include filter rehabilitation at the WTP, improvements at the Burnt Store Road storage facility, water main replacements, and various repair and reconstruction (R and R) projects.~~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~~2021-2025 is provided in Appendix #5~~6~~ - City of Punta Gorda Capital Improvement & Capital Outlay Programs~~, 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.~~

## ~~XVI.~~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 39,875 residents~~36,000 customers~~. The largest water demand within the service area comes from residential users that represent approximate ~~72~~ 71.61 percent of the water consumption. The second largest water demand is from commercial, industrial, and institutional users.~~:~~ T~~t~~he water consumption from this group is approximately 11.16~~2~~ percent ~~(12%)~~. The remaining 17.23 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 and a brackish groundwater wellfield to supply potable water to its~~the~~ service area and has a permitted withdrawal average ~~capacity~~ of 8.088 mgd. SWFWMD ~~has~~ recently published~~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~~Pipeline connections to the PRMRWSA regional water system provide a means for emergency water supply purchase.~~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 5-year CIP identifies approximately $15.0 million in capital projects planned for potable water. These projects include filter rehabilitation at the WTP, improvements at the Burnt Store Road storage facility, water main replacements, and various repair and reconstruction projects.

~~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.~~

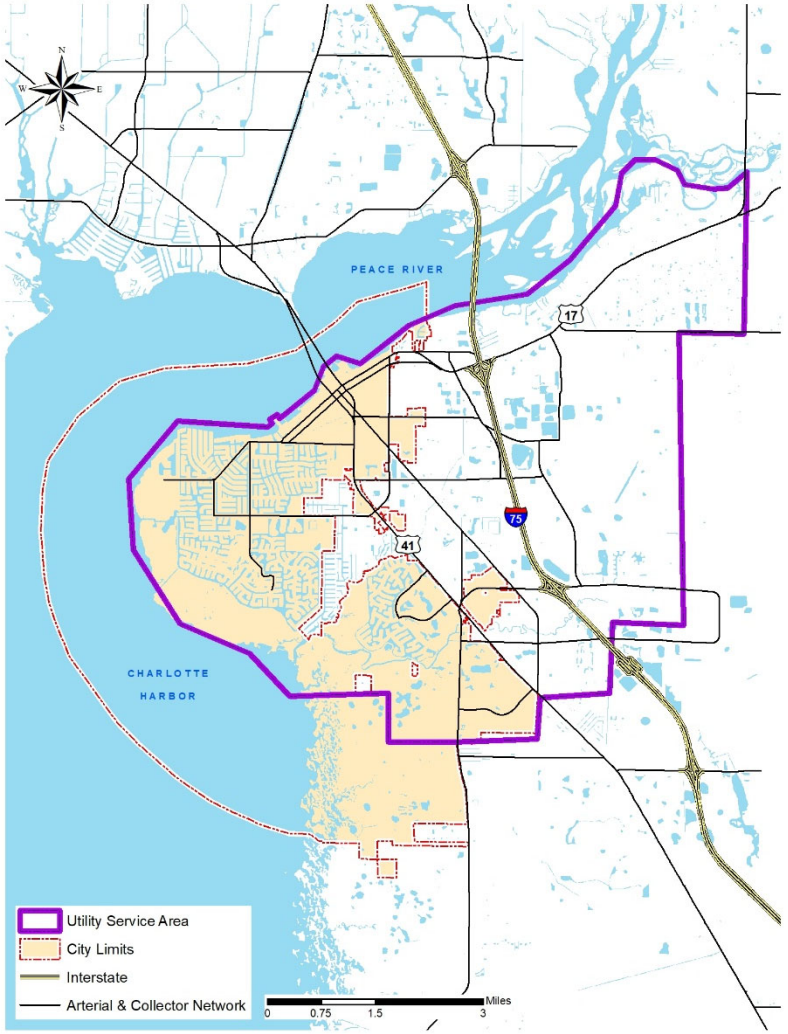
## ~~XIX.~~XI. DATA AND ANALYSIS - SANITARY SEWER

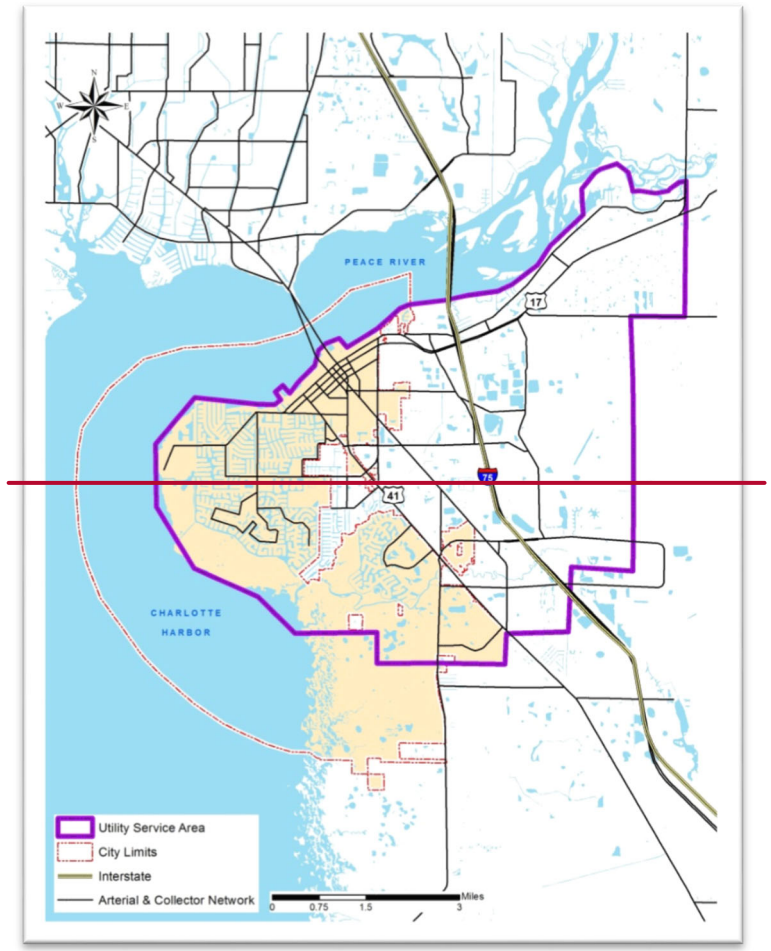
The City provides wastewater service to approximately 26,000~~25,450~~ residents within the City's utility service area. Map

#3~~7~~6 - City of Punta Gorda Utility Service Area and City Limits, illustrates the City of Punta Gorda ~~Wastewater System Infrastructure~~utility service area. 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 is considering a~~has~~ plan~~s~~ to convert some of these areas to community, sanitary sewer systems within the 5- to 10-year planning period based on recently completed septic-to-sewer planning project documents.

Wastewater is collected via relatively small~~-~~diameter gravity mains and is transported by gravity flow to approximately ~~139~~ 120 City utility~~ and privately~~ owned lift stations in the collection system. The flow is then pumped to the Master Pumping Facility on West Henry Street near Maud Street and Booster Pumping Facility on East Henry Street near the ~~Charlotte County~~Punta Gorda 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.

Map #3~~7~~6 - City of Punta Gorda Utility Service Area and City Limits






## *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.

~~103BU~~Wastewater Treatment Plant Alternatives Evaluation Summary Report

In 2019, the City completed an evaluation of improvement alternatives to achieve a treatment capacity of 4 MGD annual average daily flow (AADF) and hydraulic capacity of 12 MGD peak hour flow (PHF) at the City's WWTP. Based on the evaluation performed, it was recommended that the City upgrade the WWTP by adding a new 4 MGD AADF secondary treatment process, a new 5 MGD filter system, an additional chlorine contact tank, and an expansion of the effluent pumping system to 12 MGD. The City plans to proceed with a WWTP improvements project, with construction completion estimated in 2024.

Sewer Master Plan

In 2018, the City worked with a consultant to evaluate the portions of the City's service area that are not currently connected to the City's sanitary sewer system. The purpose of the study was to develop a plan to implement an affordable and reliable wastewater collection and treatment system for these areas. The septic-to-sewer plan was initiated to improve the water quality in the Charlotte Harbor. After development of the Sewer Master Plan, a second phase to evaluate the financial impacts and potential funding sources was completed.

Charlotte Park Septic-to-Sewer Preliminary Design Report

After completion of the Sewer Master Plan, the City retained a consultant to evaluate two available collection system options for the Charlotte Park portion of the service area. This report was completed in 2021 and recommended vacuum sewer as the most cost-effective method for providing a wastewater collection system to this area. The City will continue to evaluate potential septic-to-sewer options and funding mechanisms for the portions of the service area that are not currently connected to the City's wastewater collection system.

### 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. 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. The City continues to evaluate has investigated the potential for a reuse system. in the past; however However, a reuse system was is 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.

~~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~~ completeds ~~a~~n comprehensive Inflow and Infiltration Study in 2008 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~~ identifieds 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 on an annual basis, ~~as discussed in the *Capital Improvements Element* of this Comprehensive Plan~~.

### Wastewater Collection System Master Plan

The City ~~is~~ worked ~~ing~~ with an engineering consultant to complete a ~~n on-going~~ City of Punta Gorda Wastewater Collection System Master Plan in ~~and hydraulic wastewater force main system model. This project was completed in August~~ 2008. The primary goal of this project ~~is~~ was 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 documented existing conditions in the collection system and ~~will~~ madeke 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 120~~139~~ City utility ~~and privately~~ owned lift stations. Many of the lift stations are "gravity-lift" pumping stations and do not directly pump into force mains.; ~~l~~instead, they pump into downstream gravity lines that transport wastewater to additional lift stations, which eventually pump the wastewater into the principal~~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 leased from the Florida Fish and Wildlife Conservation Commission, located ~~seven~~ six miles east of the ~~City~~ 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 current permitted annual average daily flow treatment~~The WWTP is currently rated at a~~ capacity of the WWTP is 4 mgd. ~~based on 3-month annual average daily flow by FDEP (Permit No. FLA118371). The existing permit expires on September 21, 2019.~~ The City of Punta Gorda operates under Permit No. FLA118371. The permit was most recently renewed on September 22, 2019 with renewal required on or before September 21, 2024.

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 under-drained 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~~MGD. The injection well permit was most recently renewed on January 7, 2021 and expires on January 7, 2026. The injection well permit must be~~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~~ city limits and within unincorporated Charlotte County. Some of these facilities may connect ~~in~~to the City's wastewater system within the 10-year planning horizon. Information for these facilities is listed in Table 3.6.

## Table 3.~~46~~ - 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~~4/24/2026 |
| FLA014067 | Bay Palms MHP | 25163 Marion Avenue | 10,000 | ~~12/20/2020~~12/20/2025 |
| FLA014070 | Lazy Lagoon MHP | 8320 Riverside Drive | 70,000 | ~~10/18/2018~~5/9/2023 |
| FLA014088 | Palm & Pines Inc. | 5400 Riverside Drive | 15,000 | ~~12/23/2019~~12/23/2025 |
| FLA014105 | Pelican Harbor MHP | 6720 Riverside Drive | 20,000 | ~~3/29/2021~~3/29/2026 |
| FLA014122 | River Forest Village | 4300 Riverside Drive | 35,000 | ~~10/7/2017~~10/7/2022 |

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

## ~~XX.~~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~~ The ordinance states that the City shall provide ~~190~~ 83 gpd of wastewater capacity for residential use ~~s~~or 169 gallons per equivalent residential unit (ERU) for non-residential as a minimum LOS. The WWTP has a 4 MGD permitted treatment capacity, with a twelve month average of 2.84 MGD for the year 2022. The unused surplus treatment capacity available at that rate can accommodate 5,272 ERUs, assuming each ERU is equivalent to 220 gpd. If all zones of the Septic-to-Sewer Master Plan were implemented (1,340 lots), there would still be an estimated 3,932 ERUs of new growth development that can be accommodated by the WWTP's capacity. ~~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 3.5~~7~~. These projections ~~were developed during~~are based on the City's latest Capacity Analysis Report Update (CDM, 2019) and 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~~include connection of some 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~~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~~MGD, respectively.

## Table 3.5~~7~~ - Wastewater Flow Projections

| Year[1] | Average Daily Flow (mgd) | Maximum 3-Month Average Daily Flow[2] (mgd) | Peak Day[3] (mgd) |
|---|---|---|---|
| ~~2008~~2020[4] | 2.~~18~~57 | ~~3.03~~2.70 | ~~6.11~~5.27 |
| 2021~~13~~ | 2.81~~64~~ | 3.~~67~~12 | 7.~~40~~87 |
| 2025~~18~~ | 3.01~~49~~ | 3.33~~4.85~~ | 8.43~~9.78~~ |
| 2029~~3~~ | 3.20~~4.34~~ | 3.55~~6.04~~ | 8.96~~12.16~~ |
| Build-out[5]~~2~~ | 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.~~2021 through 2029 are based on City of Punta Gorda Wastewater Capacity Analysis Report Update (CDM, 2019).
2. The average daily flow for the 3-month period of highest flows.
3. Based on historical maximum day peaking factor of 2.8 from the Wastewater System Master Plan (Carollo, 2008)
~~1.~~4. Actual 2020 flows.
~~2.~~5. Based on evaluations completed during the Wastewater System Master Plan, the build-out wastewater flow was estimated based on land use types and historical data. ~~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.
~~2. 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 permitted capacity to accommodate existing and near-term flow projections through a 10-year period. The existing WWTP is currently permitted for 4 mgd AADF. ~~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 is completing a WWTP upgrades project to provide additional treatment reliability and rehabilitation of some unit processes. The City will also continue to maintain and expand its collection system infrastructure, such as lift stations and force mains, 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 3.6~~8~~ provides a summary of the City's ~~existing and~~ projected wastewater flows, WWTP capacity, and permitted capacity. ~~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.~~ The WWTP, as permitted, has sufficient capacity to meet projected flows through at least a 10-year period. Before 2030, the City will begin planning for an expansion of the facility to continue providing wastewater treatment to accommodate future projected flows.

**Table 3.6 – Projected Wastewater Flows and Facility Capacity**

| Year | 2020 | 2021 | 2025 | 2029 |
|---|---|---|---|---|
| Average Daily Flow (mgd) | 2.57 | 2.81 | 3.01 | 3.2 |
| WWTP Permitted Capacity (mgd) | 4.0 | 4.0 | 4.0 | 4.0 |
| WWTP Permitted Surplus (mgd) | 1.43 | 1.19 | 0.99 | 0.80 |

~~Table 3.8 - Summary of Wastewater Flows and Facility Capacity~~

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

~~Notes:~~
~~0. The average daily flow for the 30-day period of highest flows~~
~~0. 3MADF is defined as the average daily flow during the 3 consecutive highest flow months. Comparing maximum~~
~~0. month flow with 3MADF provides a conservative estimate of meeting permitted quantities.~~
~~0. Permitted surplus compares maximum month flow projections with the permitted 3MADF flow.~~
~~0. 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 ~~1~~26 of the City *Code of Ordinances*.

The City utilizes two tracks~~an established procedure~~ to approve new sewer service connections in the City's utility service area. One of these tracks is for development proposals outside the city limits. The other track is for development proposals within the city limits. Either track starts with a ~~To~~ request for wastewater service that~~,~~ a developer must complete through the~~a~~ Request for Utility Availability Form ~~with the City~~.

For development projects within~~In addition,~~ the City, the next step in the ~~completes a~~ concurrency review occurs at the time of site plan approval through the Development Review Committee (DRC) application process.~~a developer proposal.~~ The zoning official will review the request and the City ~~utilities~~ 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. 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 standard.

For development projects outside the city limits, after the Request for Utility Availability Form is submitted, the City evaluates the

availability and capacity of services. This evaluation includes an analysis of the location of the proposed utility service request and its potential impacts on existing infrastructure such as pipelines, storage tanks, and pump station capacity. The availability and potential LOS impacts are then discussed with the applicant. ~~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.

Emergency Operational Recovery

In the aftermath of Hurricane Ian, the Utilities Department drafted an after-action report of key learnings and statistics surrounding the storm and devised a plan regarding what can be done to restore operations as promptly as possible. The report stated that in the event of a future storm, crews will isolate water mains in wooded areas before the weather event. Water Distribution will also make it part of their standard operating procedure to isolate large communities fed by master metes to help with water loss. Crews will slowly open valves and let private systems fill, and if there are numerous leaks, the system will be turned off until the leaks are repaired.

## ~~XXI.~~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.~~

The City of Punta Gorda CIP contains wastewater collection and treatment projects budgeted for the next five years. The projects include improvements to the WWTP, collection system, and R&R projects. Detailed descriptions of all proposed CIP projects with a capital cost equal or greater than $100,000 are included in Appendix #5 - City of Punta Gorda Capital Improvement & Capital Outlay Programs.

The 5-year CIP identifies approximately $78.2 million in capital projects planned for the sanitary sewer. These projects include a major rehabilitation and upgrade project at the WWTP, force main replacements, and various repair and replacement projects. The approved CIP for fiscal years 2023-2027 is provided in Appendix #5 - City of Punta Gorda Capital Improvement & Capital Outlay Programs.

As shown in the City's CIP, the City is committed to maintaining its wastewater collection system, replacing aging infrastructure, and increasing reliability through rehabilitation of its WWTP.

### ~~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.~~

## ~~*XXII.*~~*XIV.* INTRODUCTION – SOLID WASTE

Management of solid waste has a direct bearing on a community's quality of life for contemporary residents and posterity. Proper waste disposal safeguards human health~~ and is, therefore, one of the most expensive municipal services~~. It is an absolute requirement for developed areas and, because of its sheer volume, consumes land, necessitating government expenditure for land acquisition to accommodate reasonable landfill capacity. In order to ensure that landfills produce the minimal level of environmental degradation~~;~~ tighter environmental regulations for landfills have been implemented over the preceding decades. Additionally,~~,~~ recycling and landscape debris composting have been added to the mix to reduce landfill capacity needs. However, ~~mandates, and~~ recycled goods market stability introduces another cost factor in the provision of these services. ~~the creation of a stable market for recycled goods.~~ The growing expense of waste disposal is further compounded by increased~~d~~ in collection ~~the transportation~~ costs in terms of labor, fuel and capital equipment.~~of a mechanized collection system~~. As the population increases, landfills reach capacity and new facilities are costly and difficult to site. Therefore, the objective of waste management has progressed from a narrow focus on efficient waste removal and disposal to include the broader aims of waste avoidance, minimization, and recycling options.

### 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~~city in an environmentally responsible an economically remunerative manner. This section identifies and describes the operations of waste collection within the city and describes the City's use of the Charlotte County Landfill. Thi~~s~~is section~~e element~~ also outlines the City's plan for solid waste disposal over the life of the ~~comprehensive~~ Comprehensive ~~plan~~Plan.

### Relationship to the City's Comprehensive Plan

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

- The *Future Land Use Element* designates the locations and intensities of development that~~ 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 service~~e~~ 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.

## ~~XXIII.~~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. §6901 et seq. (1976)

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

#### *Legislation*

House Bill 7135

In 2008, the Florida Legislature enacted House Bill 7135, which created Section 403.7032, *Florida Statutes*. This established a new statewide recycling goal of 50% for 2014 and 75% to be achieved by 2020. Also, the statute directed the Florida Department of Environmental Protection (FDEP) to develop a program designed to achieve this goal and submit it to the Legislature for approval. FDEP submitted its 75% Reduction Report in January 2010. According to the FDEP 2014 Solid Waste Report, Florida's average recycling rate in 2014 was 50%, well above the 40% target rate specified in the Florida Statute. Eighteen counties led the way with recycling rates in 2014 between 50% and 70%. As of January 1, 2015, the Department also recognized 29 businesses and other organization with recycling rate of at least 50%. At least 20 state, county, and city governmental agencies reported a 2013 recycling rate of at least 50%.

#### *Florida Statutes*

Chapter 187

Chapter 187, ~~of the~~ *Florida Statutes*, details the ~~state's~~ State's comprehensive plan. The policies call~~ed~~ for:

- The reduction of landfilled wastes of thirty percent (30%) ~~by 1994~~;
- County-wide solid waste collection systems that~~which~~ discourage littering and illegal dumping;
- Initiation of programs to develop or expand recyclable material markets;
- Strengthening and enforcing~~ement 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, such as~~:~~ identifying~~ication~~, developing~~ment~~, and encouraging~~ement of~~ environmentally sound wastewater treatment and disposal methods; and

- Encouraging~~ement of~~ strict enforcement of hazardous waste laws and swift prosecution of violators.

Chapter 403

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

### *Florida Administrative Code (Fla. Admin. Code)*

Rule~~Chapter~~ 62-701

Rule~~Chapter~~ 62-701, *Fla. Admin. Code*, outlines specific ~~s~~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~~ ~~s~~State, ~~f~~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~~ 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~~ city and other ~~such~~ places where~~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 c~~C~~ounty. The ordinance implements the programs required by the Federal and State governments, as well as the goals, objectives, and policies identified in the C~~c~~omprehensive P~~p~~lan.

## Other Regulatory Plans

Strategic Regional Policy Plan (SRPP)

The Southwest Florida Regional Planning Council assists local governments and S~~s~~tate 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 spurs~~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.

# ~~XXIV.~~XVI. DATA AND ANALYSIS – SOLID WASTE

## Inventory

The City of Punta Gorda provides curbside collection services for all solid waste, recyclables, and yard waste using a hybrid system of both internal staff and contract services.

The City provides solid waste collection twice a week for all residential customers. Collection is conducted by City staff and City-owned vehicles. For commercial customers, the City also offers collection services up to six days per week, so long as this activity does not deprive other customer of service. ~~However,~~ In addition some individual commercial properties /~~ or~~ businesses utilize private 3rd party providers for specialized solid waste collections, primarily through compactor services. All solid waste collections, residential and commercial, are hauled to the ~~The City utilizes Charlotte County's 640 acre~~ Zemel Landfill.~~;~~ This landfill is owned and operated by Charlotte County on 640 acres, approximately 6 miles south of the city. The Zemel facility is the only landfill operating in Chralotte~~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 also provides once a week yard waste collection to all residential and commercial customers by employing City staff and vehicles. These materials are hauled to a 370 acre, non-hazardous waste and construction debris landfill facility operated privately by ~~currently contracts with~~ Southwest Florida Land Developers (SLD) Waste Connections.~~;~~ This facility is also located approximately 6 miles south of the city on Zemel Road immediately adjacent to the Charlotte County landfill~~utilizing the competitive bid process for disposal of yardwaste~~.

The City also provides on demand solid waste collection for bulk items. This service also utilizes City staff and vehicles. Items collected by this service are hauled, depending on their content, to one of the two landfills on Zemel Road.

The City uses contract services for the curbside collection of recyclables. These services are available to all residential customers and to commercial customers upon request. These services are provided by a single private contractor via a competitive bid process for the entire city. This contract is currently held by Waste Management and is set for expiration and rebidding.

Hazardous waste disposal is available to the c~~C~~ity's residents in two ways. There are a limited number and type of items, including electronic waste, tires, waste oil and batteries, which the City collects via a curbside, special recycling service provided in an on-demand basis to residential customers. For all hazardous waste disposal, including those items that may be picked up curbside via the special recycling service, may be taken to the~~at the County's~~ Mid-~~-~~County Mini-Transfer Station owned by Charlotte County and 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.~~

In order to further reduce the improper introduction of bio-hazardous materials into the household waste or recycling streams, the City offers two specialized-item, disposal programs. The first of these specialized, bio-hazard disposal programs is a medicine drop-off box for unused or expired prescribed medications, over-the-counter medications, and vitamins. The second specialized, bio-hazard disposal is the Home Sharps Collection Program. Both of these programs are offered through the City of Punta Gorda Fire Department at the City's main public safety building at 1410 Tamiami Trail.

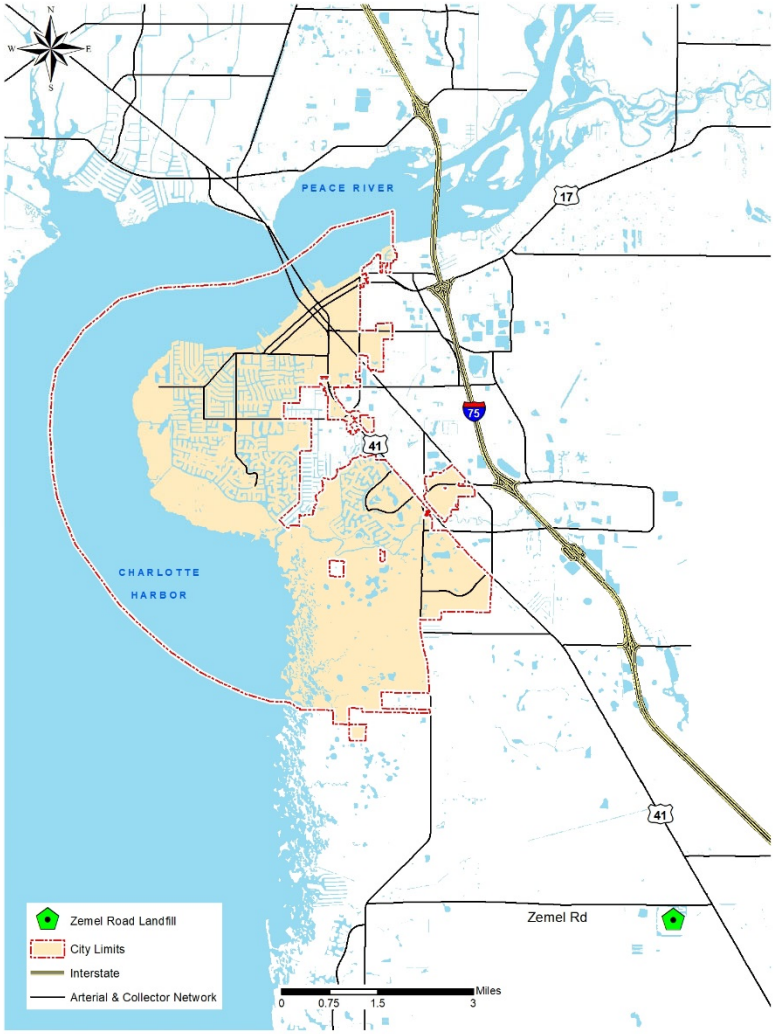
Zemel Road Landfill

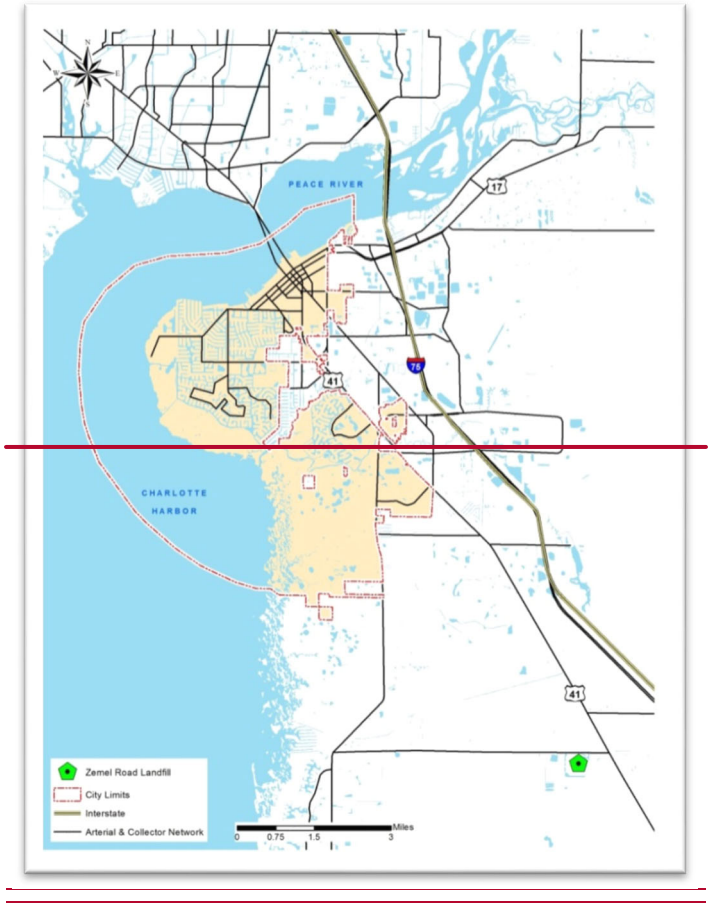
The Zemel Road Landfill is the only solid waste operational landfill in Charlotte County. It is located approximately 6 miles south of the city limits, ~~outside of the City's southern boundaries,~~ about one mile north of Lee County and just west of U.S. 41. Map #3~~8~~7 - shows the location of the Zemel Road Landfill. The County has operated a landfill at this site since 1975. This facility is currently operating ~~It operates~~ under a Class I permit issued by the Florida Department of Environmental Protection (FDEP). This permit allows the use of~~Charlotte County to use~~ 1102 acres for disposal cells. This current disposal area is projected to be in use until 2039. In addition to the current disposal area, there are an additional 190 acres available for future expansion. The remaining 340 ~~538~~ acres of the 640 acre site are devoted to wetlands mitigation, ~~future disposal cells, and~~ temporary holding areas for specific wastes, an administration building, and other facilities. The Landfill Life Report is updated annually, as required by 62-701, *Fla. Admin. Code*. This report identifies capacity based on population projections and the report estimates the remaining disposal capacity of the facility. ~~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 #~~38~~7 - 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 is~~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 yard waste. 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 a dumpster depending on the property's configuration and amount of refuse generated~~ion~~. Trash c~~C~~ompactor service is provided by Waste Management.
- Yard waste: Vegetative waste is collected at the curbside and may be placed in containers marked by yard waste labels or placed in bundles not exceeding certain sizes. Dumpsters may be designated for the use of yard waste 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 the curbside or by the dumpster depending on property configuration and the amount of 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~~ 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~~ near Murdock, on Veterans. Tires may be taken to the Charlotte County Landfill on Zemel Road for disposal.

Table 3.7~~11~~ identifies the amount of waste generated within the c~~C~~ity by user.

Table 3.7~~11~~ - 2012-2017 Disposal Tonnage by User for the City of Punta Gorda

| | FY 17/18~~12~~ | FY 18/19~~13~~ | FY 19/20~~14~~ | FY 20/21~~15~~ | FY 21/22~~16~~ | FY 22/23~~17~~ Projected |
|---|---|---|---|---|---|---|
| Residential | | | | | | |
| Total | ~~5,714.26~~6,762.81 | ~~5,660.05~~6,921.98 | 7,025.93~~5,473.22~~ | 7,085.67~~5,386.28~~ | 7,214.82~~6,381.88~~ | 3,449.06~~6,200.00~~ |
| Monthly Average | ~~476.19~~563.57 | ~~471.67~~576.83 | ~~456.10~~585.49 | 590.47~~448.86~~ | 601.24~~531.82~~ | 191.61~~516.67~~ |
| Commercial | | | | | | |
| Total | ~~3056.88~~3,968.10 | ~~2915.73~~4,053.10 | ~~3361.35~~3,413.05 | 3,855.10~~3671.64~~ | 3,956.17~~3,647.52~~ | 1,538.87~~4,300.00~~ |
| Monthly Average | ~~254.74~~330.68 | ~~242.98~~337.76 | ~~280.11~~284.42 | 321.26~~05.97~~ | 329.68~~03.96~~ | 85.49~~358.34~~ |
| Yard Waste | | | | | | |
| Total | ~~2,892.14~~3,553.40 | ~~2,952.31~~3,766.51 | ~~2,778.09~~3,845.21 | 3,688.65~~2685.45~~ | 3,710.80~~4,266.17~~ | 356.66~~,000.00~~ |
| Monthly Average | ~~241.01~~296.12 | ~~246.03~~313.88 | ~~231.51~~320.43 | 307.39~~223.79~~ | 309.23~~55.51~~ | 19.81~~250.00~~ |

Source: City of Punta Gorda 2023~~16~~

Level of Service (LOS)

The adopted LOS standard is 7.2 pounds of solid waste per person per day. The Sanitation Department reports that~~,~~ in 2022 the City collected 7,214.82 tons of waste from 19,981 residents, translating to approximately 2.18 pounds per resident per day. The department also collected 3,710.8 tons of yard waste that year from residents, equaling around 1.18 pounds per resident per day. Taken together, each house ~~currently~~ generate~~d~~s approximately 3.3~~42.39~~ pounds of refuse and yard waste per day. ~~week which indicates 5.28 waste generated per person per day~~This figure~~, which~~ is below the adopted level of service of 7.2 pounds of total waste 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~~ 2039 within the currently permitted 110 acres of disposal cells. In addition, the Zemel Road Landfill has another 170 acres available for supplementary disposal cells. This ~~and with future plans additional~~ ancillary ~~acres~~ acreage 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 throughfor the next planning horizon, the issue of landfill site expansion is of importance. Through the Conservation and Recreation Lands (CARL) Pprogram, the State and County have acquired significant portions of the lands thatwhich 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.

## XXV.XVII. INTRODUCTION – STORMWATER MANAGEMENT

Punta Gorda is a coastal community. Its geographic location makes it prone to natural disasters, particularly flooding. As a result, the stormwater management system the City has in place must be able to accommodate deluge events to protect public health and safety, by keeping roadways navigable for emergency vehicles and stagnant water from accumulating.

Stormwater infrastructure serves the dual purpose of expediently removing excess water from a given area and treating stormwater before it is released into surrounding waterbodies. Public Works engineers must manage and balance these competing objectives. An optimal stormwater management system not only facilitates human activity, it protects the environment from contamination contained in runoff. Effective stormwater infrastructure stymies pollutants from inundating our water supply and estuarine ecosystems unobstructed.

This section, required by Rule 9J-5.011—(1)—(h), *Florida Administrative Code*, contains existing regulations and programs thatwhich 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 qualitiesfeatures.

### 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 Sections to the comprehensive Comprehensive plan Plan

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

- 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, adaptation to sea level rise, and surface & and 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*.

## ~~XXVI.~~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

Senate Bill 712

The Florida Legislature's Senate Bill 712, the "Clean Waterways Act", was passed in 2020 and is now Chapter 2020-150, Laws of Florida. The bill carries a wide range of water quality protection provisions aimed at minimizing the impact of known sources of nutrient pollution and strengthening regulatory requirements. Stormwater-related pollution represents one of the largest potential contributors of nutrients throughout the state. The Clean Waterways Act directed the Florida Department of Environmental Protection and water management districts (WMDs) to update stormwater design and operation regulations under Part IV, chapter 373, *Florida Statutes*, using the latest scientific information.

Executive Order 23-06

On January 10, 2023, the Governor signed executive Order 23-06 to enhance environmental protection and expedite water quality projects. Executive Order 23-06 builds off of the Clean Waterways Act by continuing to invest in water quality improvement, protecting water resources, building resilient communities, and preserving conservation lands. It expands the Wastewater Grant Program funding from septic-to-sewer conversions and advanced wastewater treatment projects to projects that address the impacts of stormwater and agricultural runoff and aging wastewater infrastructure that increases nutrient loading to surface groundwater. The order also seeks to reduce the frequency and severity of blue-green algal blooms and red tide, as well as provide expedited hurricane recovery relief and support the completion of comprehensive vulnerability assessments for all of Florida's municipalities.

### *Florida Administrative Code (FAC)*

~~Chapter~~ Rule 40D-2

~~Chapter~~ Rule 40D-2, *Florida Administrative Code*, "Basis of Review~~;~~", includes stormwater system design criteria~~;~~ as well as technical and administrative information for applicants and permits. The Southwest Florida Water Management District's (District) Year-round water conservation measures are part of the District rules (Rule 40D-22, *Florida Administration Code*). The rule primarily focuses on allowable irrigation practices, including lawn and landscape watering that are in place where there is no drought

or other declared water shortage. The District generally uses the term "measures" instead of "restrictions" to distinguish the year-round practices from stricture watering limitations that can be imposed during a water shortage. These practices are meant to reduce wasteful irrigation habits and to help conditions lawns for drought survival.

~~Chapter~~ Rule 40D-4 ~~and Chapter 40D-40~~

~~Chapter~~ Rule 40D-4 ~~and Chapter 40D-40~~, *Florida Administrative Co*de, "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 Rule 40D-8

~~Chapter~~ Rule 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~~ Rule 62-302

~~Chapter~~ Rule 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. The rule e~~E~~stablishes minimum criteria for each surface water classification in order to protect public health and enhance the quality of waters of the s~~S~~tate.

~~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.~~

Rule 62-330

Rule 62-330, *Florida Administrative Code*, "Environmental Resource Permitting", applies to activities that involve the design of a stormwater management system, requiring them to have a permit.

~~Chapter~~ Rule 62-340

~~Chapter~~ Rule 62-340, *Florida Administrative Code*, "Delineation of Wetlands and Surface Waters", provides the methodology for delineating wetlands and surface waters. ~~Chapter~~ Rule 62-4, *Florida Administrative Code*, "Permits~~;~~", FDEP/SWFWMD contains the rules regarding permit standards (standards for issuing dredge and fill, stormwater, and water quality permits). It provides for the classification and exemption of certain waterbodies for permitting purposes and includes water quality standards. The rule also provides that permits cannot be issued for sewage facilities that directly discharge to an Outstanding Florida Water (OFW) that~~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 R. 62-600, *Florida Administrative Code*.

~~Chapter~~ Rule 62-40

~~Chapter~~ Rule 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~~ Rule 62-43

~~Chapter~~ Rule 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~~ Rule 62-600

~~Chapter~~ Rule 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 wastewater treatment (ATW) standards were

deemed necessary by FDEP. It also establishes criteria for the discharge of wastewater to certain wetlands.

### ~~Chapter~~ Rule 62-620

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

### ~~Chapter~~ Rule 62-625

~~Chapter~~ Rule 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~~state. The goal of the Act is to prevent harm to the water resources of the ~~State~~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 FDEP, 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 Florida 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~~ 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 one (1) acre and above and includes those municipalities not included under Phase I.

Coastal and Heartland National Estuary Partnership [formerly known as Charlotte Harbor National Estuary Program] (CHNEP)

In 1995, Charlotte Harbor was accepted into the National Estuary Program, which was originally hosted~~is administered~~ locally by~~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).

Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act)

On April 20, 2010, an explosion on the Deepwater Horizon oil rig drilling in the Gulf of Mexico caused the largest offshore oil spill in the United States, exacerbating the effects of previous natural disasters. On July 6, 2012, the President signed into law the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act). The Act established the Gulf Coast Restoration Trust Fund in the U.S. Treasury Department. As provided in the RESTORE Act, activities, programs, and projects that are eligible for grants awarded under the Direct Component (eligible activities) include: infrastructure projects benefitting the economy or ecological resources, including port infrastructure, as well as projects that advance coastal flood protection and related infrastructure.

## *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; and
- 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, FDEP, FFWCC, and advisory committees associated with the SWIM program.

## Outstanding Florida Waters (OFW)

The Outstanding Florida Waters ~~program~~ (OFW) Program 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 (Rule~~Chapter 17-3.041(1)~~62-302.700, *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 that~~which~~ would degrade a downstream OFW. The rules also require that dredge and fill projects ~~which~~ that 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~~ 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~~ 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 FDEP'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~~ chapter 403, *Florida Statutes*, currently implemented by the SWFWMD and FDEP under ~~Chapter~~ chapter 373, *Florida Statutes*.

### Florida Department~~Department~~ of Environmental Protection (FDEP) Surface Water Sampling Program

The FDEP 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~~ city ~~Location~~ locations 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 FDEP's STORET ~~Data~~ data ~~System~~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~~ 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: Resilience

### Charlotte County Master Stormwater Management Plan

The completion of the Charlotte County Stormwater Management Plan (MSMP) assisted the City's ~~Stormwater~~ stormwater ~~Management~~ management by identifying drainage ~~those~~ basins associated with the ~~City~~city. The three basins identified in South County were determined to be less dependent on structural controls, and were identified as basins ~~which~~ that 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~~ city by providing proper water conveyance ~~throughout the City~~. The ~~city~~ 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 in~~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 preemptively~~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.

### Boca Grande Water Quality Improvement Project

The Governor of Florida approved the Boca Grande Water Quality Improvement project for $1 million in grant funding from the Department of Economic Opportunity. The project will create two stormwater ponds to further treat the runoff from the surrounding neighborhood prior to being discharged to the North Fork of Alligator Creek and Charlotte Harbor. The drainage system upgrades will align this neighborhood with the rest of the City in ridding the community of standing water within 72 hours of the

last rainfall event. The reduction in time that standing water exists will provide a reduction in habitat for mosquitoes, increase property values and increase quality of life for the residents of the area. The total estimated construction cost is approximately $5.7 million for the project. The project is being funded through a Florida Department of Economic Opportunity Community Development Block Grant, a Southwest Florida Water Management District grant and the 1% Local Sales Tax Program.

Living Shorelines

In 2019, the City, in concert with the CHNEP and Taylor Engineering, started the Living Shorelines project. Creating a living shoreline is an adaptation strategy that protects Punta Gorda from dynamic wave action. The project is part of larger efforts to re-establish oyster habitat along the shoreline, stabilize the shore during flood events, protect the adjacent environment during a disaster, and improve water quality.

Wastewater Mutual Aid Program

The City of Punta Gorda and surrounding municipalities established a mutual aid program to provide a method whereby water and wastewater utilities, sustaining physical damage from natural or manmade disasters, could obtain emergency assistance in the form of personnel, equipment, materials, and other associated equipment necessary to maintain water and wastewater facilities. The purpose of this agreement is to enhance local ~~build~~ resiliency through marshaling regional resources in the face of natural or human disasters.~~.~~

Adaptation Planning

The City of Punta Gorda remains committed to adaptation planning and creating a resilient built environment. In 2009, an assessment of regional and local vulnerabilities was conducted. During that time, the City used public participation games, individual interviews, pre- and post-workshop surveys, and other tools to identify vulnerabilities. The 2009 plan identified 54 vulnerabilities, ranked by citizens during a series of public workshops. The citizens also reached a consensus on adaptation actions for the City to implement which corresponded to the listed vulnerabilities. ~~;~~The vulnerability assessment was conducted to address public infrastructure within the city limits, with an emphasis on coastal flooding impacts to critical facilities and historic properties. The purpose of a vulnerability assessment is to help a municipality or community identify and prioritize structural and social assets that are likely to be impacted by future coastal flooding and sea level rise. Vulnerability assessments are broken into three components: exposure analysis, sensitivity analysis, and focus area identification and mapping. This analysis also forms the basis for complying with the “Peril of Flood” statute requirements. Upon preliminary completion of the vulnerability exposure analysis, the City engaged stakeholders and citizens to provide input in the next steps.

In

2017, the City made an update of vulnerabilities, which identified three specific adaptation focus areas ~~(maps)~~ and added a living shorelines element to the adaptation strategy mix. The City plans to conduct a

~~2023~~ vulnerability assessment update in 2023 to be consistent with State r~~R~~equirements (2040 and 2070) and the stipulations of the living shoreline pilot project. All of the strategies developed by the City are made in effort to implement the overarching vision of a community that can withstand and overcome, structurally and economically, any disaster that befalls it.

# ~~XXVII.~~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 the h~~H~~ydrologic c~~C~~ycle. Natural processes that~~which~~ control stormwater are in constant change. ~~.~~ S~~s~~treams 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 ~~Statues~~statues, 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 Comprehensive Plan adoption, the City of Punta Gorda encompasses approximately 32~~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~~ city's drainage basins lie within the nearly pristine Charlotte Harbor State Buffer Preserve to the south of the urbanized area of the ~~City~~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~~ city is looked upon favorably by the FDEP and is an accepted and approved method of removing pollutants before entering into the ~~state~~ State's waterbodies.

## Land Use and Effects of Urbanization on Stormwater Management

The proximity of the City of Punta Gorda~~,~~ to~~along~~ the shores of the Charlotte Harbor Estuary~~,~~ can ~~be~~ greatly impact~~ed~~ the estuary with~~by~~ contamination~~nts~~ from stormwater run~~-~~off. Encompassing approximately 4,360 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 estuary's~~ie~~s ecosystem.

As a watershed urbanizes, components of its natural stormwater systems (i.e., natural depression~~al~~ storage, wetlands, ~~floodplains~~and 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 that ~~which~~ clog~~s~~ waterways, smother~~s~~ bottom living aquatic organisms, and increase~~s~~ turbidity, thereby decreasing light penetration into water bodies, which reduces beneficial aquatic vegetation such as sea grasses.
- Oxygen demanding substances that~~which~~ consume the oxygen within water bodies, sometimes creating an oxygen deficit that leads to fish kills.
- Nutrients (e.g. nitrogen and~~,~~ phosphorus) that~~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 (such as lead, cadmium, chromium, copper, and zinc), which can disrupt the reproduction of fish and shellfish and accumulate in their tissues.
- Petroleum hydrocarbons (such as oils, greases, and polyaromatic hydrocarbons) which are toxic to many aquatic organisms.
- Coliform bacteria and viruses that~~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 thatwhich 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 thatwhich include:

- Installation of inlet placards at all inlets that discharge into surface water bodies;
- Street-sweeping programs 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 and& hold debris and sediment before entering into State water bodies; and
- 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 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~~ city is relatively difficult and expensive due to the ~~City's~~ 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 the quality of discharge should be consistent with the recommendations being developed by the ~~Charlotte~~ Coastal and Heartland~~Harbor~~ National Estuary Partnership~~rogram~~ (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 relevant~~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 less than or equal to a six-inch~~<6"~~ depth at the outside edge of the 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~~ state of Florida. In the ~~City~~city, flood effects are local issues, impacting a neighborhood or community, and~~but~~ can impact a large area, affecting entire river basins and multiple states. The ~~City~~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 participates in both~~is rated by~~ the NFIP and~~under~~ the Community Rating System (CRS). The ~~Community Rating System~~ voluntary CRS 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 lower~~s~~ insurance costs. FEMA, through the CRS program, rates each community on a scale from one to ten, with one being the best obtainable rating. The City of Punta Gorda has maintained a ~~class~~ rating of Class 5~~6~~ since 2016. This classification results in a ~~20~~25% reduction in ~~residents'~~ flood insurance rates for qualifying properties within the city.

### Maintenance of Public Stormwater Management Facilities

The Public Works Engineering ~~Department~~ and Right-of-Way Divisions are~~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~~ 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 Modified T~~t~~ype 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 r~~R~~oadways shall be designed with the lowest pavement elevation at or above the design high~~-~~water elevation, resulting from a 25-y~~Y~~ear frequency, 24-h~~H~~our duration rainfall event, distributed in accordance with a Soil Conservation Service (SCS) Technical Release ~~-~~55 (TR-55) Modified Type 2 ~~modified~~ storm, assuming an antecedent moisture condition of 2.

- Local rResidential sStreets shall be designed with the pavement centerline at or above the design high- water elevation resulting from a 5-yYear frequency, 24-hHour duration rainfall event, assuming an antecedent moisture condition of 2.
- Parking fFacilities shall be designed with a maximum temporary detention depth of 0.75 feet, resulting from a 5-yYear frequency, 24-hHour duration rainfall event, distributed in accordance with a SCS TR-55 Modified Type 2 modified storm, assuming an antecedent moisture condition of 2. Retention storage above parking areas is prohibited.

## Future Direction

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

- Developing and implementing a Master Stormwater Management Plan,
- Planning for the strategic implementation of system modifications to mitigate the risks associated with sea level rise,
- 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, and
- 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.

## ~~XXVIII.~~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 2045~~0~~ planning horizon, consistent with the ~~Ten Year~~ Water Supply Facilities Work Plan 2021 Update, 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 demand ~~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 3.1.1.1~~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.~~ Continue to use the newly constructed brackish groundwater wellfield and reverse osmosis treatment facility in order to provide additional treatment capacity and reliability to the system.

***Measurement:** The annual monitoring and compliance with the water use permit. ~~The completed planning, engineering and construction of the off stream reservoir.~~*

**Policy 3.1.1.2~~3~~:** The City of Punta Gorda will comply with the conditions and requirements set forth in the City's existing water use permit for the Shell Creek reservoir.

***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 3.1.1.3~~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 of~~in~~ the water system.

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

**Policy 3.1.1.4:** The City will maintain a diverse water supply to maximize its resiliency.

***Measurement:** Capacity of various water sources relative to total annual average daily demand.*

**Policy 3.1.1.5:** The City will maintain a wellfield management plan for withdrawal points to ensure sustainable production of the wellfield as part of its water use permit, issued by the SWFWMD.

***Measurement:** Track management plan updates and maintenance of SWFWMD water use permit.*

**Objective 3.1.2:** The City will put in place emergency planning strategies, to be enacted during or after an emergency event, that maintain or restore the operations of water and wastewater facilities.

**Policy 3.1.2.1:** The City will identify and map key infrastructure (networks, pipelines, or points of production or distribution) that may be affected in the event of an emergency.

***Measurement:*** *Annual updates of inventory and mapping of key infrastructure vulnerable to emergencies.*

**Policy 3.1.2.2:** The City will recommend or require standby power generators for critical infrastructure in case of extended power outages, based on FDEP regulatory standards.

***Measurement:*** *Inventory of standby power generators relative to critical infrastructure that require these systems.*

**Objective 3.1.3:** 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 3.1.3~~2~~.1:** The City of Punta Gorda will continue to upgrade the wastewater facilities as identified ~~through the Wastewater Collection System Master Plan~~in the WWTP Alternatives Evaluation Summary Report and other planning activities.

***Measurement:*** *The implementation of the recommendations identified in the ~~Wastewater Collection System Master Plan~~WWTP Alternatives Summary Report.*

**Policy 3.1.3~~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~~ water use permit.*

**Policy 3.1.3~~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 3.1.3~~2~~.4:** Comply with the conditions and requirements set forth in the City's wastewater permit.

***Measurement****: Annual monitoring of the wastewater permit.*

~~**Policy 3.1.32.5:** Evaluate the cost-benefit of the eliminationon of septic system areas within the Utility Service Area and pursue alternative funding strategies to implement the recommendations.~~**e**

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

**Policy 3.1.3~~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 3.1.3~~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 3.1.3~~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.*

**Policy 3.1.3.9:** Continue to monitor regulatory requirements that may necessitate the implementation of advanced wastewater treatment systems.

***Measurement:*** *Annual assessment of regulatory requirement changes and determination of impacts.*

**Objective 3.1.4:** The City will enact water quality protections aimed at minimizing the impact of known nutrient pollution sources by seeking funding to construct, upgrade, or expand water facilities, provide advanced wastewater treatment, convert septic-to-sewer, and dedicate funding to increase alternative water supply.

**Policy 3.1.4.1:** The City will continue to identify, examine, and address impacts from nonpoint sources, including septic systems, package plants, and aging wastewater infrastructure within the utility service area that increases nutrient loading to surface groundwater.

***Measurement:*** *Inventory and mapping of wastewater infrastructure (City Utility or privately owned), which may contribute to nonpoint source pollution.*

**Policy 3.1.4.2:** Strategically engage with State agencies, legislators, and stakeholders to identify the most effective and beneficial water quality improvement projects.

***Measurement:*** *Record of the engagement strategies, including meetings, lobbying efforts, and other similar activities.*

**Policy 3.1.4.3:** Continue to seek grant monies for and prioritize septic-to-sewer conversions.

***Measurement:*** *Documentation of projects for which grant applications have be submitted.*

**Policy 3.1.4.4:** Partner with State and Federal agencies to improve long-term comprehensive planning that ensures sustainable growth while protecting our natural resources, including prioritizing sewer connections and advanced wastewater systems that can sustain increased population demands.

***Measurement:*** *Record of intergovernmental meetings and correspondence.*

**Objective 3.1.5:** The City will take emergency preparedness measures to ensure that water and sewer services maintain or regain operations as efficiently and expediently as possible in the event of a natural or man-made disaster.

**Policy 3.1.5.1:** Identify and map key infrastructure and vulnerable areas that may be affected by flooding.

***Measurement:*** *Map and inventory of such areas and infrastructure including periodic updates.*

**Policy 3.1.5.2:** Create an emergency action plan that incorporates strategies to be deployed during and immediately after a disaster event to maintain water and wastewater facilities, including provisos for: a) regaining power to water pumps and water and wastewater facilities via standby power generators; b) participating in programs or inter-local agreements with organizations and governments that provide emergency assistance in the form of personnel, equipment, materials, and other necessary materiel.

***Measurement:*** *Annual updates to emergency action plan.*

**Policy 3.1.5.3:** The City will participate in programs with other municipalities or governments that facilitate the availability of wastewater services after a natural or man-made disaster.

***Measurement:*** *Record of all active intergovernmental agreements.*

**Policy 3.1.5.4:** The City will continue to participate in the Regional Mutual Aid Program.

***Measurement:*** *Record of continued participation in the Regional Mutual Aid Program.*

**Objective 3.1.6:** The City will enact programs, mandated by the FDEP, that protect drinking water from contamination.

**Policy 3.1.6.1:** Continue to conduct activities to comply with the Cross Connection Control Program requirements that survey and inspect all commercial and residential connections to the City's system to prevent backflow or "back siphonage".

***Measurement:*** *Annual report of Cross Connection Control Program actions taken.*

**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~~ section 163.3177(6)(c), ~~*F.S.*~~*Florida Statutes.*

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

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

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

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

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

**Policy 3.2.1.2~~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 3.2.1.3~~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~~ 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:** Maintain~~odify~~ 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:*** *Review~~Adoption of new~~ level of service standard for new development.*

**Policy 3.2.2.2:** Maintain~~odify~~ 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****: Review~~Adoption of new~~ level of service standard for new development.*

**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 per ERU, 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~~ about water conservation ~~use~~ by providing updates in City communications.

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

**Policy 3.3.1.5:** Follow the SWFWMD's water conservation measures to reduce irrigation demands by adoption of City ordinance.

***Measurement:*** *Documentation of said ordinance and record of actions taken to ensure compliance.*

**Goal 3.4:** The City of Punta Gorda will provide a safe and sanitary system for the collection, ~~and~~ disposal, reuse, and recycling 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 amount~~number~~ of capital equipment purchased.*

**Policy 3.4.1.3:** The City of Punta Gorda will meet either of the following two level~~s~~ 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~~ section 163.3220, *Florida Statutes*, or an ~~Agreement~~ agreement or Development Order issued pursuant to ~~Chapter~~ chapter 380, *Florida Statutes*.

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

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

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

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

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

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

**Policy 3.5.1.2:** Punta Gorda will maintain or ~~enhance~~ increase the per capita amount of solid waste~~s~~ and yard waste~~s~~ that are recycled or otherwise not deposited in the landfill.

***Measurement:*** *An annual report of recycled waste.*

**Policy 3.~~4~~5.1.3:** 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.*

**Policy 3.5.1.7**: The City will conduct a waste audit to evaluate potential reductions in the amount and cost of waste removal.

***Measurement:*** *Record of waste audit.*

**Objective 3.5.2:** Punta Gorda will support Charlotte County's 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's 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~~to 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's drop-off stations and their collection methods.

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

**Policy 3.6.1.3:** The City will continue to collect medical waste (i.e. sharps and pills) and facilitate their disposal through the fire and police departments.

***Measurement:*** *Annual report of continued medical waste program.*

**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 mitigate flood risks to the community from both storm events and sea level rise~~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 flood risks~~ing 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 and nuisance 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 identify water quality issues based on the existing stormwater system and develop capital improvements program to improve the quality of water within the area.

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

**Objective 3.7.2~~Policy 3.7.1.3~~:** The City of Punta Gorda will continue to implement the National Pollutant Discharge Elimination System as a means of addressing stormwater quality~~ through the implementation of the National Pollution Discharge Elimination System by:~~.

~~Completing and implementing a Stormwater Plan.~~

~~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.~~

~~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 3.7.2.1:** The City will complete and implement a Stormwater Plan.~~

***Measurement:*** *Existence of a Stormwater Plan and record of its continued implementation.*

**Policy 3.7.2.2:** The City will continue to implement best management practices (BMPs) for stormwater

management and flood control, such as street-sweeping, catch-basin cleaning, swale reconstruction, annual inspection of facilities, etc. to advance water quality standards or reduce flooding.

***Measurement:*** *Annual report of these activities.*

**Policy 3.7.2.3:** The City will continue to require new construction and redevelopment to be covered by stormwater design requirements in Rule 40D-4, *Fla. Admin. Code*, and meet design requirements for water quality as specifically contained in the Basis of Review (BOR) for Environmental Resource Permit Applications within the SWFWMD, described in Florida Administrative Code Rule 40D-4.091. For projects involving existing stormwater systems not required to be improved per the standards of R. 40D-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 3.7.2~~1~~.4**: Punta Gorda will cooperate with Charlotte County in the development of stormwater facilities in drainage basins that overlap ~~City~~ city boundaries.

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

**Objective 3.7.3~~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 3.7.3~~2~~.1**: Punta Gorda will continue ~~provide and maintain~~to maintain the City's swale~~s and underground storm sewer~~ systems.

***Measurement****: Progress report completed annually for ~~maintenance to drainage facilities or structures~~swale restoration program.*

**Policy 3.7.3.2**: The City will develop a maintenance system for the underground stormwater conveyance infrastructure.

***Measurement:*** *The development of a stormwater infrastructure maintenance plan.*

**Policy 3.7.3~~2~~.3~~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 3.7.3~~2~~.4~~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 3.7.3~~2~~.5~~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~~size, 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~~3.6~~5~~**: New or reconstructed City a~~A~~rterial and c~~C~~ollector r~~R~~oadways shall be designed with the pavement centerline elevation at or above the design high-~~-~~water elevation resulting from a 25-y~~Y~~ear-~~-~~frequency, 24-h~~H~~our-~~-~~duration rainfall event, and the anticipated impacts of sea level rise within the capital maintenance lifecycle shall be considered for mitigation through a cost-benefit analysis.

***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 3.7.4~~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 3.7.4~~3~~.1**: Punta Gorda will maintain or improve its classification under the National Flood Insurance Program (NFIP) Community Rating System (CRS) 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~~because of 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's class ratings and new City applications to improve its classification.*

**Policy 3.7.~~4~~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.~~4~~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.*

**Objective 3.7.5:** The City will implement a stormwater management plan to mitigate the effects of flooding on the water quality of the Charlotte Harbor Estuary and the surrounding waters, and reduce the impact of stormwater on urban land uses.

**Policy 3.7.5.1**: Maintain wastewater treatment plant operations that do not discharge to a surface water body, complying with stormwater pollution prevention (SWPP).

***Measurement:*** *Annual report of wastewater treatment plant discharge operations.*

**Policy 3.7.5.2:** The City will design and implement, through ordinance, best management practices aimed at reducing nutrient and total suspended solid loads to receiving waters.

***Measurement:*** *Documentation of said ordinance and record of actions taken to ensure compliance.*

**Policy 3.7.5.3:** Punta Gorda will reduce tidal flooding by maintaining check valves in stormwater management systems within the Adaptation Areas identified in the 2018 City of Punta Gorda Adaptation Plan Update.

***Measurement:*** *Annual report of maintenance activities for existing check valves within the Adaptation Areas.*