IV.
PUBLIC FACILITIES

GREEN COVE Springs

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IV. PUBLIC FACILITIES ELEMENT

A. INTRODUCTION

The purpose of the Public Facilities Element is to determine ways to provide for future potable water, stormwater, wastewater, solid waste, and aquifer recharge protection requirements for the City in correlation with the principles and guidelines for future land use.

1. Geographic Service Area & Interlocal Agreement

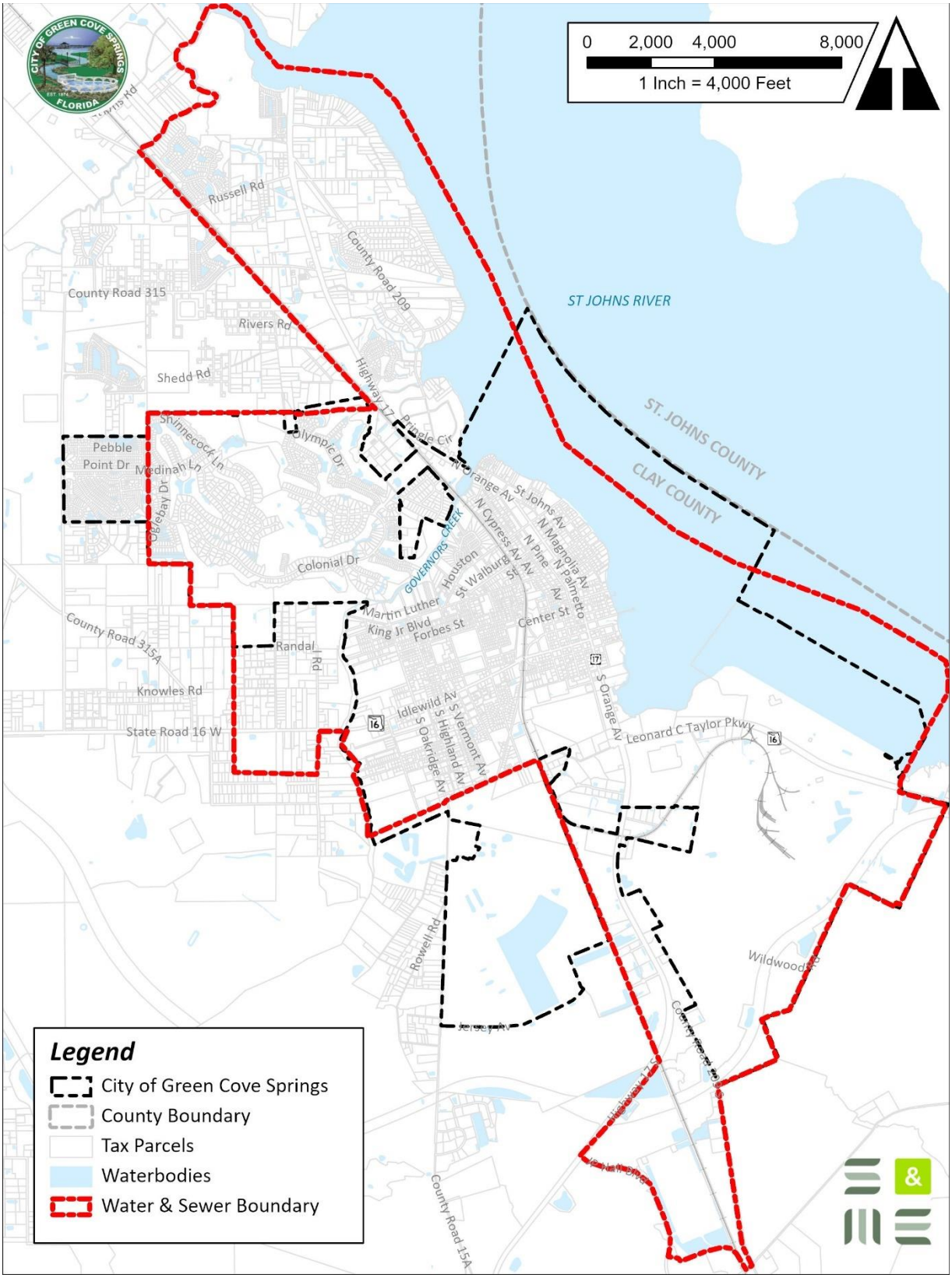
The Clay County Utility Authority was established in October 1994, by Chapter 94-491, Laws of Florida, Special Acts of 1994, giving CCUA jurisdiction over unincorporated areas of Clay County adjacent to the City of Green Cove Springs corporate and jurisdictional limits. The City of Green Cove Springs and the Clay County Utility Authority entered into an Interlocal Agreement in March 1998.

This agreement allows the City of Green Cove Springs to provide water and wastewater utility services in the area depicted in Map IV-1. The agreement allows the Authority to reserve 200 Equivalent Residential Connections each of water and wastewater to provide bulk services to anticipated Authority customers outside the City's service area. CCUA provides water and sewer services to any area within City Limits that is not also within the utility boundary, specifically Magnolia West and the proposed Ayrshire development, as depicted in Map IV-1.

The City will continue to provide utilities within the City limits and the existing service area. The City will coordinate any future extension of the service area with Clay County.

Other City services, including stormwater, solid waste, and aquifer recharge, are limited to the City Limits, as depicted in Map IV-1.

Map IV-1. Geographic Service Area



Source: City of Green Cove Springs, 2021

B. SANITARY SEWER

1. Regulatory Framework

Federal. The Federal Water Pollution Control Act (PL 92-500) is the controlling national legislation related to the provision of sanitary sewer service. The goal of this act is the restoration and/or maintenance of the chemical, physical and biological integrity of the integrity of the nation's waters. The act established the national policy of implementing area-wide waste treatment and management programs to ensure adequate control of sources of pollutants. Under Section 201 of PL 92-400, grants are made available to local governments to construct facilities to treat "point sources" of pollution, which include effluent from sewage treatment processes. The U.S. Environmental Protection Agency is responsible for implementing the act.

State. The Florida Air and Water Pollution Control Act, Chapter 403, F.S., is the state's primary environmental and pollution control statute and regulates sewage treatment plants and the discharge of treated wastes.

The "Standards for Individual Sewage Disposal Facilities" contains rules of the Florida Department of Health for individual sewage disposal facilities. These apply to permit application review standards for the location, design and construction of individual systems.

The Florida Department of Environmental Protection (DEP) has rules for the regulation of wastewater facilities (Chapter 17-6, F.A.C.) which treat flows exceeding 5,000 gallons, per day (gpd) for domestic establishments, 3,000 gpd for food service establishments, and where the sewage contains industrial, toxic or hazardous chemical wastes.

Local. The City of Green Cove Springs owns and operates the sanitary sewer facilities, which serves most of the City. Clay County Utility Authority (CCUA) serves a small portion of land, annexed into the City in 1999 and an additional 560 acres that have been annexed in 2021. The City and the authority entered into an Interlocal Agreement in 1998 to determine the service area. There are 365 units that are on septic tanks within the service area however only about 10 of those septic tanks are located within the City limits. The City requires all new development to connect to the central sewer system.

2. Public and Private Wastewater Facilities

Within Green Cove Springs, the City owns the only public wastewater facilities and provides service for most residences and businesses in the City. A small residential area adjacent to Foster Lane is currently being served by septic tanks. In total however, there are a very small number of septic tanks (approximately 10) in use within the City limits, however, within the City water / sewer service area there are approximately 365 units with septic tanks.

The corporate limits of the City of Green Cove Springs, excluding the Magnolia West development and Ayrshire Development are located within the City's sewer service area. Clay County Utility Authority (CCUA) serves the Magnolia West development, annexed into Green Cove Springs in 1998. Magnolia West is a 163-acre development consisting of 535 residential units located on the north side of the City. CCUA shall also serve the Ayrshire Development which is a proposed subdivision for 2,100 single family homes. These are the only two major developments that are served by the Clay County Utility Authority inside the City limits.

3. Wastewater Treatment

Wastewater generated by the City is treated at one of two wastewater treatment plants. Wastewater from the Northern and Core City sections are treated by the Harbor Road Wastewater Treatment Facility (WWTF) which has a treatment capacity of 0.75 million gallons per day (MGD). Wastewater from the South and Reynolds Industrial areas of the city are treated by the South WWTF which has a capacity of 0.35 MGD. The wastewater is collected throughout the city by a combination of gravity and force main piping systems which includes 38 sewage pumping (lift) stations.

In 2015 the City completed a Wastewater Master Plan which involved an extensive review of the future needs for wastewater treatment. From this master plan, the City developed a five-year plan to combine all wastewater treatment at the Harbor Road WWTF by constructing a new advanced wastewater treatment (AWWT) facility. By design, AWWT plants reduce the concentration of nitrogen in the effluent to approximately three (3) parts per million (ppm) and concentration of phosphorus to one (1) ppm (the importance of reducing nitrogen and phosphorus discharges is more fully described below in the Reclaimed Water section). The plant will be designed and built in phases as the City grows.

In 2015 the City began an evaluation to determine the most effective method to upgrade their wastewater treatment facilities. The evaluation included the following;

- Facilities Plan – complete evaluation of potential new plant sites including land values (cost), suitability of land for effluent application (ability to percolate water), costs of line extensions, etc.
- Complete evaluation of latest technology and efficient / effective plant types
- Analysis of the City's finances in general
- Capital Finance Plan
- Water, sewer, reclaimed Water Master Plans
- Water, sewer, reclaimed Water Rate Studies

From that evaluation a decision was made to consolidate our treatment facilities at the Harbor Road site, mothballing the South Wastewater Treatment Facility (WWTF). Some of the primary drivers of that decision were proximity to reclaimed water customers & future growth, existing river outfall, size of the site and other factors.

Once again utilizing FDEP SRF funding /grant programs, the following activities have been completed;

- Planning Study (Complete & Paid in Full)
    - $80,000.00 total cost / $28,000.00 grant (35%), $52,000.00, 0.05% interest, 20-year loan
- Design, Permitting & SSES (Complete)
    - $2,261,200 total cost / $1,490,835 grant (66%) / $770,365.00, 0.05% interest, 20-year loan
- Phase I Construction (Complete)
    - $6,120,600 total cost / $4,063,425 grant (66%) / $2,057,175.00, 0.05% interest, 20-year loan

Phase I Construction includes reclaimed water plant improvements, new electrical system and upgrades to Master Lift Stations #2 and #4. The upgrade to Lift Station #2 will support the pumping of the sewage from the South WWTF to Harbor Road and mothballing the facility.

Phase II Construction of the new 1.25 million gallon per day (MGD) advanced wastewater treatment facility at the Harbor Road site began in April of 2021. The total cost of the project is $15.6 million. The city received 20-year loan and grant funding from the FDEP-SRF program, and a SJRWMD Cost Share Grant for the financing. The new facility will produce highly effective nitrogen and phosphorus removal in addition to doubling the capacity to produce reclaimed water

4. Residuals (Sludge) Treatment

Treated solids collected from the wastewater treatment process are referred to as "residuals" or sludge. The sludge is dewatered (dried) and taken to the Clay County Rosemary Hill Landfill for final disposition.

5. Effluent Disposition

The treated water from a wastewater treatment plant is referred to as "effluent". The effluent from the City's wastewater treatment plants meets (actually exceeds) the State and Federal regulatory requirements. The final effluent is discharged one of two ways - into lakes at Magnolia Point Golf and Country Club for irrigation (called reclaimed water or reuse) or directly into the St. Johns River.

6. Reclaimed Water

As mentioned above, an excellent use of effluent from the wastewater treatment plants is for irrigation, called reclaimed water. Use of reclaimed water provides two primary benefits – reducing drinking water withdrawals from the Floridian Aquifer and reducing nutrient discharges to the St. Johns River.

The Floridian Aquifer is located in limerock approximately 1000 feet below the ground. This excellent source of water is a very precious and limited resource. During heavy irrigation periods (spring, summer) nearly fifty percent (50%) of the water produced by the City is used for irrigation. Utilizing reclaimed water for irrigation reduces withdrawals from the Floridian Aquifer and preserves this precious drinking water for human consumption.

Nutrients (primarily nitrogen and phosphorus) which are naturally occurring in wastewater (and wastewater effluent), have been found to contribute to algae growth in surface water (lakes, streams, rivers). When these nutrients are discharged into surface water algae blooms occur which reduces oxygen levels and affect naturally occurring plants and animals. Sending the plant effluent to irrigation reduces discharge of the effluent, and ultimately nutrients, to the St. Johns River.

In 2017, the City completed the North Grid Reclaimed Water Main which provided piping to distribute reclaimed water to the Edgewater Landing and Black Creek Village developments. The pipe will also support any future developments in the norther service territory. The total cost of the project was 2 million dollars. The City utilized the St. Johns River Water Management District (SJRWMD) Cost Share Program to secure a 33% ($666,000.00) grant. The balance was paid through retained earnings and did not require a loan. The equipment to actually place reclaimed water in the pipe and to the customers is included in the Wastewater Phase I & II Construction projects described above.

7. Wastewater Collection

In 2018 the City completed a Sanitary Sewer Evaluation Survey (SSES) of the Core City wastewater collection (underground pipes, manholes, etc.) system. The lines were cleaned and videoed, and accurate maps produced of the system. From the videos areas in need of repair were identified and prioritized, and a strategic capital improvement program created. The City received significant grant funding from the Florida Department of Environmental Protection (FDEP) State Revolving Fund (SRF) to complete this task.

Table IV-1. Wastewater Collection & Transmission Basin Summary

Basin ID	Pump Station Location	WWTP Service Area*	PS Discharge Location	Treatment Location
1	SR 16 West near Cemetery	North-Core	P.S. #4 Collection System	HRWWTP
2	Palmetto Ave & Golfair St	South-Reynolds	SWWTP	SWWTP
3	Gum St & St Johns Ave	North-Core	P.S. #4 Collection System	HRWWTP
4	Lamont St	North-Core	HRWWTP	HRWWTP
5	Vermont Ave & East St	North-Core	P.S. #4 Collection System	HRWWTP
6	Middleburg Ave	North-Core	P.S. #4 Collection System	HRWWTP
7	Governor Cir	North-Core	P.S. #4 Collection System	HRWWTP
8	Gum St at Public Works	North-Core	P.S. #4 Collection System	HRWWTP
9	City Hall at Walnut St	North-Core	P.S. #4 Collection System	HRWWTP
10	Electric Dept. at Harbor Rd	North-Magnolia	HRWWTP	HRWWTP
11	Magnolia Layne Shopping Ctr	North-Magnolia	HRWWTP	HRWWTP
12	North End of Enterprise Way	North-Magnolia	HRWWTP	HRWWTP
13	Constancia Drive (Magnolia)	North-Magnolia	HRWWTP	HRWWTP
14	Muirfield opposite Inverness	North-Magnolia	HRWWTP	HRWWTP
15	Colonial Dr & Stonebriar	North-Magnolia	HRWWTP	HRWWTP
16	Cherry Hill Ct (Colonial Dr)	North-Magnolia	P.S. #15 Collection System	HRWWTP
17	Preston Trail (Shoal Creek)	North-Magnolia	P.S. #16 Collection System	HRWWTP
18	Shinnecock	North-Magnolia	P.S. #14 Collection System	HRWWTP
19	North of SR 16 E (Reynolds)	South-Reynolds	SWWTP	SWWTP
20	JP Hall Industrial Park	South-Reynolds	P.S. #2 Collection System	SWWTP
21	Food Lion Warehouse	South-Reynolds	P.S. #2 Collection System	SWWTP
22	HRWWTP	North-Magnolia	HRWWTP	HRWWTP
23	SWWTP	South-Reynolds	SWWTP	SWWTP
24	Pegasus (Reynolds)	South-Reynolds	P.S. #19 Collection System	SWWTP
25	SWWTP Lab Bldg	South-Reynolds	SWWTP	SWWTP
26	Winn Dixie US 17 North	North-Upper	HRWWTP	HRWWTP
27	Calico Jack (The Cove)	North-Core	P.S. #4 Collection System	HRWWTP
28	Olympic Drive	North-Magnolia	P.S. #13 Collection System	HRWWTP
29	Hickory Knolls	North-Upper	HRWWTP	HRWWTP
30	Five Oaks	North-Upper	HRWWTP	HRWWTP

Source: City of Green Cove Springs Public Works Department

**Defined in the Wastewater Master Plan*

8. Septic Tanks

Septic tank systems provide on-site wastewater treatment for both residential and small-scale commercial development. Effluent from septic tank systems is discharged to the drain field where it is allowed to percolate into the soil. Soil permeability and depth to the water table may be limiting factors on septic tank performance and may require construction of elevated drainage field grounds to ensure adequate performance.

As noted previously, there are a few residences and commercial establishments currently being served by septic tanks. The City does not plan to extend sewer lines to these areas since there has been no evidence of septic tank failure. None of the septic systems are located in hydric soils.

9. Impact on Adjacent Natural Resources

The City's treatment of wastewater effluent consists of the chlorination for disinfection purposes. Effluent that is discharged to surface waters (St. Johns River) is dechlorinated to eliminate the potentially toxic effects of chlorine on the ecosystem. The disinfected effluent from the treatment train flows to an effluent box and out of the plant through a 15-inch vitrified clay outfall. Sludge from the plant is stabilized through aerobic digestion for a minimum of 15 days in the treatment unit and then dewatered and landfilled.

10. General Performance of Facilities Based on Adequacy of LOS

The Level of Service (LOS) of 120 gallons per capita per day is utilized primarily in establishing total flows expected over the planning period. The average per capita usage is 89.1 GPCD as set forth in the 2020 fiscal year. The Wastewater Master Plan was completed in 2015. Staff has estimated that build out for the wastewater service area will require approximately an additional 2.9 MGD capacity.

11. Population Projections

This table shows the population projections for the City's service area.

Table IV-2. Wastewater – Projected Flow

Year	Service Area Population*	LOS per capita (GPD)	Total Projected Flow (MGD)
2025	11,860	120	1.4232
2030	14,150	120	1.698
2035	15,300	120	1.836
2040	18,360	120	2.2032

Source: City of Green Cove Springs, Mittauer & Associates

**Service Area Population includes the population in the City limits and portions of unincorporated Clay County which are within the Utility Service Area.*

12. Projected Improvements

The City of Green Cove Springs has programmed the improvements for the next five years to maintain the level of service. Projects in the first three years of the five-year schedule are programmed and funded. Project in the fourth and fifth year of the five-year schedule will be funded through City revenues and anticipated grant awards.

Table IV-3. Wastewater – Projected Improvements

Project	FY 2021-2022	FY 2022-2023	FY 2023-2024	FY 2024-2025	FY 2025-2026
Rehab Sewer Lines	100,000	0	151,875	142,155	0
New Meter Reading Infrastructure and Software	75,000	0	0	0	0
Equipment – Plant & Lift Station Repair	50,000	50,000	50,000	60,000	60,000
Equipment - Vehicles	40.000	95,000	0	0	0
Lift Stations	50,000	50,000	75,000	75,000	0
Treatment Plant Improvements	13,860,000	925,000	2,775,000	500,000	0
Totals	14,135,040	1,120,000	3,051,875	777,155	0

Source: City of Green Cove Springs Public Works Department

C. SOLID WASTE

1. Regulatory Framework

Federal. The potential environmental impacts of solid waste facilities have led to the development of an extensive network of permitting requirements at the federal and state levels. Impacts on air and water quality are reviewed by the U.S. Environmental Protection Agency (EPA) and where dredging and filling might occur, by the U.S. Army Corps of Engineer (COE).

For hazardous waste, the national Resource Conservation and Recovery Act (RCRA) of 1976 directed the EPA to develop a national program to regulate and manage hazardous waste and provide incentives for states to adopt consistent programs. The national Comprehensive Emergency Response and Compensation Liability Act (CERCLA), passed in 1980, provided the EPA with authority and funds to respond to incidents requiring site clean-up and emergency mitigation (the EPA "Superfund" program). This Act also defined the liability of businesses engaged in hazardous waste generation, transport and disposal, and provided enforcement processes.

State. At the State level, the Florida Resource Recovery and Management Act (Sec. 403.7, F.S.), passed in 1980, adopted federal guidelines and directed the DEP to develop and implement a hazardous waste management program. This Act provided for: 1) adoption of federal hazardous waste definitions; 2) a system to monitor hazardous waste from generation to disposal; 3) an annual inventory of large hazardous waste generators; 4) permit requirements regulating treatment, storage and disposal of hazardous waste; 5) funds for hazardous waste spill and site clean-up; 6) hazardous waste management facility site selection procedures; and, 7) fines and penalties for violators.

Amendments to the Florida Act in 1983 provided directions and funds to establish a cooperative hazardous waste management program between local, regional and state levels of government. These changes included provisions for county-level hazardous waste management assessments and site selection for hazardous waste management facilities at the county, regional and state levels.

The DEP regulates solid waste facilities by the permitting of the construction and operation of such facilities. The Clay County Commission currently owns the landfills in the County and is responsible for their operation

and maintenance. The County is also responsible for siting and permitting any new landfills needed for future populations.

Clay County is required by the State legislature to provide for the solid waste disposal needs of both the unincorporated portions of the County and the incorporated entities in the County.

Local. The City of Green Cove Springs is responsible for the collection of garbage and trash for both residential and commercial areas in the City if under the City contract.

2. Terminology

The definition of solid waste encompasses garbage, rubbish, refuse and other discarded solid or semi-solid materials which are products of domestic, industrial, commercial, agricultural and governmental operations.

Solid waste does not include solid or dissolved materials in domestic sewage or other major pollutants in water resources, such as silt, dissolved solids in industrial wastewater effluent, dissolved materials in irrigation return flows or other common water pollutants.

3. Services & Service Area

In 1994, the City contracted out commercial collection to a private contractor. At that time, a recycling program began in conjunction with Clay County. To reduce tonnage and tipping fees, yard waste was no longer taken to the landfill. A mulching program was started. However, due to the accumulation of mulch and the lack of a site to continue the program, mulching was discontinued within a few years.

In April, 1997, the City entered into an Interlocal Agreement with Clay County whereby the City assesses a $7.00 per month fee to residential customers for Class I debris disposal in lieu of the tonnage tipping fees for each delivery of Class I solid waste. The City pays tipping fees for delivery of Class II and III debris. This has greatly reduced the costs of collection by the City. The governing precepts of the Interlocal Agreement between Clay County and the City of Green Cove Springs was updated and adopted in September 2002

The City's Public Works Department provides a collection service to the entire City. Commercial locations which can use the City-provided Garbage Can (65- or 95-gallon commercial grade Otto can or similar brand) without overflow and all residences with the City's municipal limits are provided curbside collection. The City established a Solid Waste Franchise System in 2014 to manage commercial containerized collection and construction and demolition collection. Commercial locations in need of containerized collection may choose from a list of non-exclusive franchises available on the City Website under the Solid Waste Division.

The City's Public Works Department provides residential curbside recycling using a two-bin system. The two-bin system was implemented in November 2017 to reduce contamination of recycled material and simplify the City's separation of recycled material.

Table IV-4. Solid Waste Customers

Type	# of Customers
Commercial	221
Residential	2,701

Source: City of Green Cove Springs Customer Service Department (April 28, 2021)

4. Design Capacity, Current Demand, and Level of Service

The City operates 2 packer vehicles, 20 yards each, one Recycle truck that is 16 yards and Two 2-ton 16 yards trash claw truck. The City's collection facilities will, from time to time, need to be replaced as equipment and trucks become worn out.

In 2021 there were an estimated 2,701 residential customers and 221 commercial customers. Based on The Cities ADG financial system City collected approximately 4,290. tons of Class I and 68 tons of Class III, 11 tons of white goods, 1,339 tons of yard waste, 1 ton of tires and 203 tons of recycling per year of trash. This equates to approximately 4.53 pounds per day per capita.

Based on the above historical information and the estimated population in 2020, Table IV-5 shows the estimated amount of solid waste generated by the City as well as the amount projected. The current Level of Service (LOS) is calculated in a "pounds per person per day" unit.

Table IV-5. Solid Waste Generation Rate 2020-2045

Year	Projected Population	Pounds per Year	Pounds per Day per Person
2020	9,786	17,859,450	5
2025	11,859	21,642,675	5
2030	14,143	25,810,975	5
2035	16,297	29,742,025	5
2040	18,363	33,512,475	5
2045	18,768	34,251,600	5

Source: City of Green Cove Springs Public Works Department

The City's collection system is adequate for the planning period according to the City's Solid Waste Department. The population is not expected to increase to such a degree that the Department would be under-staffed and under-equipped. The City has indicated that the regular replacement and repairs of equipment will always be a factor in providing adequate and consistent services to its population

5. Facility Inventory

Clay County's only Class I facility, Rosemary Hill Landfill, has been closed pursuant to the DEP regulations. However, through an Interlocal Agreement, the City of Green Cove Springs transports residential solid waste to the Rosemary Hill Landfill. Commercial solid waste is transported to landfills that have contracted with the individual hauler. Clay County then transfers the solid waste to landfills in Nassau County, Florida and Camden County, Georgia. Rosemary Hill continues to be used as a Class III Landfill. Other facilities within Clay County have been closed in accordance with the DEP regulations. Clay County has the necessary future reserve capacity provided by an independent contractor.

Per the Clay County, there is capacity to handle the unincorporated and incorporated areas of Clay County at the landfills.

6. Impact on Adjacent Natural Resources

As with older landfills, the environmental impacts of landfills were not properly assessed when the landfills were originally permitted and subsequently constructed.

Landfills were not constructed with adequate liners, if any at all, nor was stormwater runoff controlled in a manner which would prevent receiving waters from being polluted. Additionally, poor monitoring of the

types of waste entering the landfill led to an unknown number and type of hazardous materials being dumped in landfills. As a result, legislation has changed the way landfills are constructed, where they can be built, how they will be monitored and, how, if at all, they will operate. Due to the new environmental permitting regulations, many landfills are being closed down due to leachate leaking into groundwater resources and/or in stormwater runoff. Most times, the landfills are closed versus "repaired" due to the prohibitive cost of bringing the landfills into operating compliance.

The old Rosemary Hill Class I landfill has been closed and is under a consent order by the DEP. The County will need to add more monitoring wells and conduct other post-closure activities over the next 20 years. The County collects leachate from the landfills and then recycles it over the landfill.

7. Hazardous Waste Generators and Sites

In 1985, the Legislature amended Section 403.7225, F.S., to require counties to update their Hazardous Waste Management Assessment every 5 years. The County must forward waste generation and management information obtained from this procedure to the Florida Department of Environmental Protection. (FDEP). Annual site verification of 20 % of the generators on the master list will continue to be required.

A review of the FDEP hazardous waste files indicates 12 potential hazardous waste generators and sites in the City limits. These are identified in Table IV-6 by the owner responsible as well as the location.

The Former Lee Field Naval Air Station, now part of the Reynolds Industrial Park, is being studied by the U.S. Army Corp of Engineers. The Corps is conducting quality control at former Department of Defense sites and their findings, to date, indicate there is no indication of heavy metals in the underground storage tanks and little or no petroleum contamination of the groundwater. Based on preliminary findings, the Corps is continuing to monitor the sites due to some readings of tests. They have not pinpointed any source of contamination but if contamination is found, the policy of the Corps would be to remove the source.

As will be noted in the Potable Water section later in the report, Reynolds Industrial Park has a potable water facility within the Park as well as several wellheads. The Corps indicated that the sites they are testing are not within 200 feet of the wellheads, however, 1 well had a limited benzene contaminant but it has not been a consistent reading and the cause or source of the benzene has not been determined. The benzene reading was still within the EPA's and DEP's acceptable limits for potable water.

Table IV-6. Hazardous Waste Generators and Sites

Type	Address	Owner
Confirmed Contamination - Underground Storage Tank	100 N Orange Ave	H & H
Hazardous Waste Generator	SR 16 & Railroad	CSX Transportation
Hazardous Waste Generator	Reynolds Industrial Park	Beetle Plastics
Hazardous Waste Generator	Reynolds Industrial Park	Hope Corguard Inc.
Hazardous Waste Generator	5 Esplanade Ave	Clay County Road Dept
Confirmed Contamination - Underground Storage Tank	Center Street	Clay County Schools Transportation Dept
Asbestos Site	Reynolds Industrial Park	S.R. 16 and Hwy 17
Hazardous Waste Generator	Reynolds Industrial Park	H & S Fiberglass

Source: City of Green Cove Springs, Clay County

8. Improvements

The City does actively pursue a resource recycling program which reduces the amount of solid waste being disposed of in the landfill in accordance with state statutes. The City has set aside funding in its capital improvements for solid waste improvements. The City has projected $330,000 in capital improvements for the Solid Waste Program for FY 2022/23, $180,000 in improvements of FY 2024/25 and $350,000 in improvements for FY 2025/26.

D. STORMWATER

1. Regulatory Framework

Federal. Section 208 of the Federal Water Pollution Control Act (PL92-500, 1972) is the directing federal law with respect to water pollution abatement. In implementing the Act, the Environmental Protection Agency (EPA) identified pollutants carried in stormwater runoff as a major source of water contamination. To achieve the pollution abatement goals of the Act, EPA provided assistance to state and local governments to develop Areawide Water Quality Management Plans, or "208 Plans" as they are commonly known. These 208 Plans studied a broad range of potential water pollution sources, including stormwater, and focused on identifying pollutant sources and abatement needs as well as development of regulatory programs to ensure implementation. At present, there are no federal regulations for stormwater management concerning the quantity of stormwater runoff

State. The Florida Department of Environmental Protection (DEP) has adopted a Stormwater Rule (Ch. 62-330, F.A.C.) to fulfill part of the state's responsibilities under Section 208 of the Federal Water Pollution Control Act. The Rule's basic objective is to achieve 80-95 percent removal of stormwater pollutants before discharge to receiving waters. This Rule requires treatment of the first inch of runoff for sites greater than 100 acres in size and the first 1/2 inch of runoff for sites 100 acres or less in size.

Treatment is generally accomplished through retention or through detention with filtration. Retention requires the diversion of the required volume of runoff to an impoundment area with no subsequent direct discharge to surface waters. Pollutant removal by settling and by percolation of the stormwater through the soil is almost total. Detention facilities are typically within the line of flow of the drainage system. Stormwater from a site passes through the detention facility and is filtered prior to discharge to remove pollutants.

Implementation of the Stormwater Rule is achieved through a permitting process. The DEP has delegated permitting responsibility to the regional water management district with jurisdiction over the Clay County Area. Exemptions to the permit requirements are provided for: 1) facilities serving individual sites for single family, duplex, triplex or quadruplex units; 2) facilities serving dwelling unit sites which are less than 10 acres in total land area, have less than 2 acres of impervious area, and which comply with local stormwater management regulations or discharge to a permitted regional facility; and 3) facilities for agricultural or silvacultural lands which have approved management plans.

Pursuant to F.S. 403.0891, the State, the water management districts, and local governments have a responsibility to develop mutually compatible stormwater management programs.

Region. Water management districts must establish district and, where appropriate, watershed or drainage basin stormwater management goals which are consistent with the goals adopted by the State and plans adopted pursuant to the Surface Water Improvement and Management Act (F.S. 373.41-373.4595).

Local. Local governments shall consider the water resource implementation rule, district stormwater management goals, plans approved pursuant to the Surface Water Improvement and Management Act.

The City of Green Cove Springs requires drainage systems for subdivisions to be in accordance with the Florida DOT drainage manual. The City Engineer must review and approve the developer's design of the drainage infrastructure as well as final disposal of stormwater. Detention/retention ponds and basins shall be designed and constructed to meet the DEP and SJRWMD standards.

Encouraging all residents to acquire needed permits from the SJRWMD is the strongest recommendation that the City can promote for strengthening the City's drainage program. The lack of staff to adequately oversee this process will be a challenge for the City in the future.

2. Terminology

Natural drainage systems are defined by the topography of an area. The largest feature of a natural drainage system is the drainage basin or watershed. The boundary of the basin is called the basin divide, which is a line where the natural land elevation directs runoff from the basin toward a common major drainage feature, such as a river, lake or bay. The major drainage feature is often called the receiving body and the smaller features are its tributaries.

Manmade drainage facilities are artificial constructs designed to store or convey stormwater runoff. Swales, ditches, canals and storm sewers are typical conveyance structures, collecting stormwater runoff and directing it toward downstream receiving waters. Stormwater storage structures are generally classified as either detention or retention facilities. Detention facilities are designed to temporarily impound runoff and release it gradually to downstream portions of the drainage system through an outlet structure. Retention facilities are impoundments that release stormwater by evaporation and by percolation into the ground, with no direct discharge to surface waters.

3. Natural Drainage Features, Land Uses Served, and Geographic Service Area

Existing land uses served by the drainage facilities are primarily urban. Generally, stormwater runoff is drained by Governors Creek west and north, the St. Johns River to the east and a woodland area to the south. Both Governors Creek and the woodlands eventually drain to the St. Johns River. In the Industrial Park, the topography is generally lower than the rest of the City. The highest elevation in the Industrial Park is only 20 feet and slopes to 10 feet near the edges of the St. Johns River. Most of Reynolds Park is drained by the River. The Magnolia Point PUD's topography ranges from a low elevation of 25 feet to its highest elevation at 50 feet. Runoff is directed towards Governors Creek and adjacent wetlands.

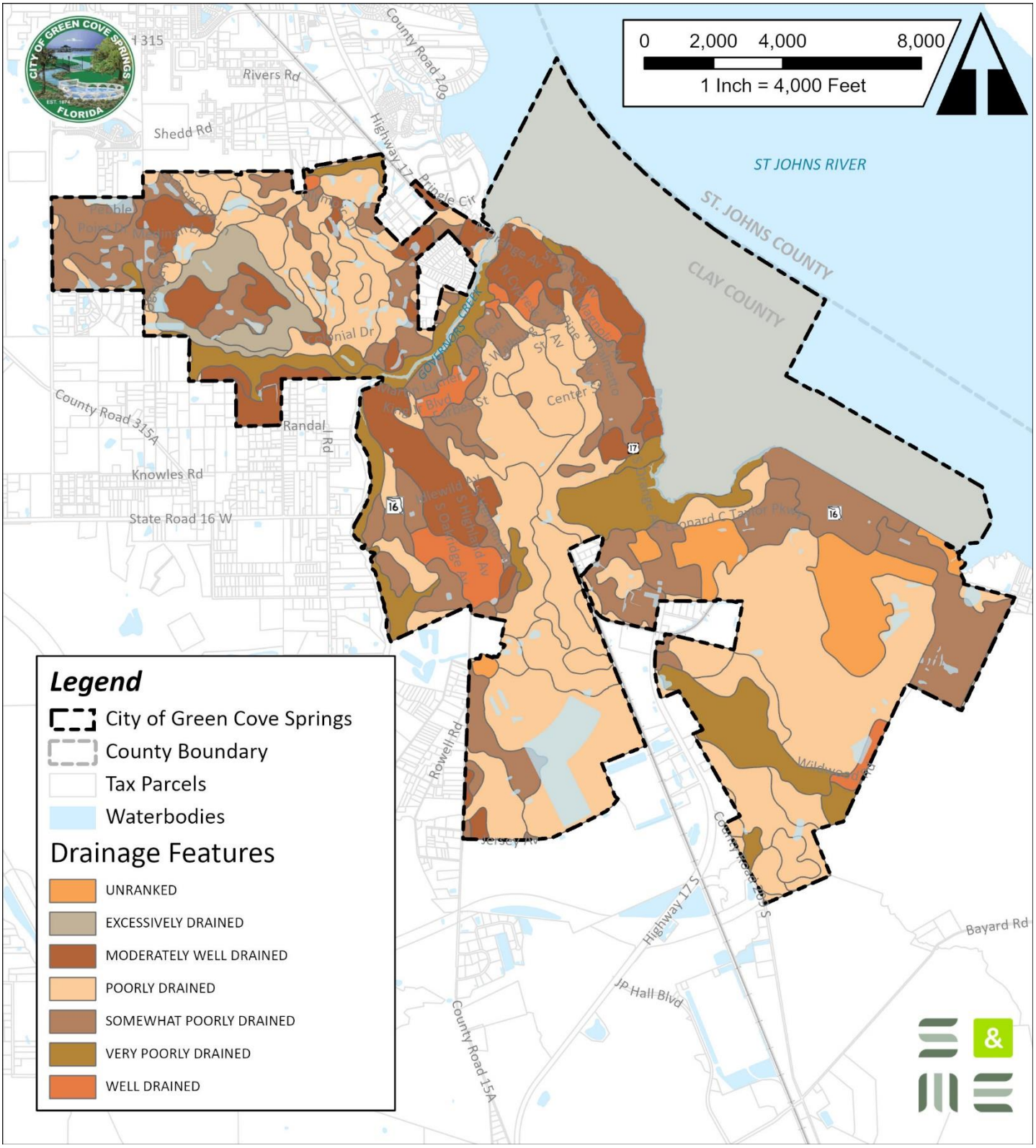
Existing land use within the Core City of Green Cove Springs is predominantly urban with higher development densities, including commercial development, along the major highways. The average existing imperviousness within the drainage study area is about 21 percent. Imperviousness for future development conditions, based on current zoning designations, is not expected to exceed 32 percent. Much of the City is situated on soils with relatively low infiltration and percolation rates. These combined factors contribute significantly to the drainage problems occurring in the City.

Drainage facilities in Reynolds Industrial Park have served primarily industrial uses. Any redevelopment of Reynolds Park will require the property to improve the drainage as part of the development plan. In Magnolia Point, the drainage facilities serve a residential/golf course development.

The Public Works Department maintains City streets and storm drainage facilities. The City drainage is divided into three areas. To the north is Magnolia Point Golf and Country Club, to the south is the Reynolds Industrial Park and in the center is the Core City. Magnolia Point and Reynolds Industrial Park storm water and drainage is the responsibility of the private entity owners. The City is responsible for the Core City. The drainage

facilities consist of open swales, pipes of various types and ages, catch basins, manholes, sediment traps/ baffle boxes and stormwater ponds.

Map IV-2. Drainage Features



Source: City of Green Cove Springs, S&ME, Natural Resources Conservation Service 2021

4. Public and Private Stormwater Facilities

The Public Works Department of the City of Green Cove Springs maintains City streets and storm drainage facilities. The Department is responsible for operation and maintenance of all public stormwater management facilities in the City. Private facilities include those developed on private commercial lots, newly developed stormwater facilities, and the following specifically:

- Stormwater facilities in Magnolia Point Golf and Country Club, Magnolia West, the Preserve, Cottages on Cove, and Reynolds Industrial Park are privately owned and maintained.
- County and School Board maintain drainage facilities on their property.
- Florida Department of Transportation is responsible for drainage along S.R. 16 and U.S. Hwy. 17.

Proposed subdivisions, including the Ayrshire development, will privately own their stormwater facilities through homeowner's associations or other entities, unless an exception is made to current practice.

5. Design Capacities, Current Demand, Level of Service

Pipe materials include VCP, CMP of all types, RCP, PVC water and sewer pipes and CPP. Many drainage basins have no treatment, while newer systems meet current requirements of the SJRWMD. Local area flooding occurs in several areas of the Core City. The City is currently required to follow the NPDES stormwater rules, and has completed mapping of the stormwater system

City crews, without benefit of design, installed many of the older systems on a piecemeal basis with action taken to try to correct individual problems without looking at the larger picture. In many cases, pipe was installed at slopes insufficient to transport suspended materials resulting in sedimentation in the pipes. Joints in pipes did not receive proper treatment resulting in infiltration of water and soil, which results in potholes above these bad pipe joints. Different pipe materials were joined with no way to make the joint watertight, also resulting in infiltration and potholes. City crews are constantly repairing pipes trying to improve the overall system one repair at a time. Grant requests are being used to improve the system on a larger scale.

A grant was received to develop a stormwater pond to prevent stormwater from reaching the old landfill. This grant allowed for the construction of a baffle box/sediment trap for the 54" outfall on Cypress Street.

In 2006, a grant was received for drainage improvements to the area east of the railroad and north of S.R. 16, which will, renovate existing piping, prevent flooding and install baffle boxes on all outfalls of this fully developed area of the Core City.

Magnolia Point consists of approximately 1,160 acres, the total acreage in 2001 after annexations as described in Land Use Element. The Master Site Plan allows for 200 acres for the golf course, including the lakes and 105 acres for passive recreation. The drainage consists of a series of retention ponds. Portions of the development that were constructed within the system have been permitted for a 25 year/24 hour storm event.

In 2021, a Community Development Block Grant was received from the state to assist in the replacement of the antiquated stormwater system on West Street from Martin Luther King Jr. Ave to Bonaventure Avenue. The remainder of the project will be paid through the City budget and be completed by the summer of 2022.

6. Facility Capacity Analysis, Adequacy of Level of Service

Evaluation of the existing drainage facilities indicates several problem areas. Many portions of the existing system are old and beyond their useful life and require replacement. Many portions are undersized and/or do not have adequate slope.

Thirteen drainage sub-basins were identified as potential flooding problem areas from the drainage basin evaluations. There are several areas in the City, which were determined to have major drainage problems. No improvements are necessary or recommended for the drainage facilities in Reynolds Industrial Park or Magnolia Point.

7. Impact of the Facilities on Adjacent Natural Resources

Improper drainage flows can impact environmentally sensitive areas such as floodways and flood plains of the St. Johns River and Governors Creek. Stormwater runoff usually contains pollutants from streets, businesses, fertilizers, etc., and should be adequately treated before entering waterways. Design criteria of future drainage structures should mitigate adverse impacts to these areas and stormwater management facilities should be designed to utilize or improve the natural capacity or function of these hydrologically sensitive areas.

The wetlands in the City, found primarily in floodways along the St. Johns River and Governors Creek, can also be impacted by improper drainage. Governors Creek, which enters the St. Johns River in the vicinity of Green Cove Springs, is also considered to be moderately impaired. Water quality problems come from several non-point source categories: construction, agriculture, mining, urban and hydrologic modification. There are no known agricultural or mining activities in the City of Green Cove Springs. Some of the listed pollutants include sediments, nutrients, bacteria, pesticides, debris, metals and oils/grease.

Overall, the entire Lower St. Johns River is moderately impaired. In some areas of the River, loss of wetlands has been cited as allowing pollutant runoff to reach the river without benefit of natural stormwater storage and treatment mechanisms that wetlands may provide.

8. Proposed Improvements

The City of Green Cove Springs completed a Master Drainage Plan and is currently in the process of implementing. The recommended level of service in Green Cove Springs is as follows.

Table IV-7. Proposed Stormwater LOS Standards

Facility	Description	Standard	Physical Reference
Roadway Ditches, Culverts, and Crossdrains	Evacuation Routes & Arterials	50 year / 24 hour for open system	HGL 1.0' Below EOP / TOB
		10 year / 10 minute for piped system	HGL 1.0' Below Gutter
	Collector Road	25 year / 24 hour for open system	HGL 0.5' Below EOP / TOB
		3 year / 10 minute for piped system	HGL 0.5' Below Gutter
	Local Residential Road	10 year / 24 hour for open system	HGL 0.5' Below EOP / TOB
		3 year / 10 minute for piped system	HGL 0.5' Below Gutter
Stormwater Systems	Roadway or Development	3 year / 10 minute	Refer to roadway classification above
Retention Basins	Outfall to Open Stream or Lake Watershed	Critical Duration (up to 24 hour) 100-year post storm (post ≤ pre runoff peak rate)	Flood Stage 0.5' Below TOB

Facility	Description	Standard	Physical Reference
	Outfall to a Closed Watershed	Critical Duration (Up to 24 hour) 100-year storm is retained and that only pre-development runoff volume is discharged at rates not to exceed the pre-development rates	Flood Stage 1.0' Below TOB
	Landlocked Areas with No Positive Outfall	Critical Duration (Up to 24 hour) 100-year storm (retain total volume of runoff from contributing area with no discharge)	Flood Stage 1.0' Below TOB
Detention Basins	Outfall to Open Stream or Lake Watershed	Critical Duration (Up to 24 hour) 25 year storm (post ≤ pre runoff peak rate)	Flood Stage 0.5' Below TOB
Water Quality	Treatment of Stormwater in Accordance with Chapter 62-330 F.A.C.	For Class III -Off-line retention of the first 1/2 inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater. Plus, on-line retention of an additional one-half inch of runoff from the drainage area over that volume specified for off-line treatment. For Class I, II or OFW provide an additional 50% treatment from what is determined above.	N/A

HGL = Hydraulic Grade line, EOP = Edge of Pavement, TOB = Top of Bank

Critical Duration: *The duration of a specific storm event (i.e., 100-year, 1 hour storm) which creates the largest volume or highest rate of net stormwater runoff (post-development runoff less pre-development runoff) for typical durations up through and including the 24-hour duration event. The critical duration is determined by comparing various durations of the specified storm and calculating the peak rate and volume of runoff for each. The duration resulting in the highest peak rate or largest total volume is the "critical-duration" storm. Rainfall amounts shall be determined by the FDOT District 5 IDF curves.*

Source: City of Green Cove Springs, CHW

Table IV-8. Stormwater – Five-Year Schedule of Capital Improvement Projects

Project	FY 2021-2022	FY 2022-2023	FY 2023-2024	FY 2024-2025	FY 2025-2026
West Street	1,018,431				
Julia Street	50,000	750,000			
Clay Street Basin		35,000	500,000		
Ferris Street Basin				275,000	
Esplanade Ave Rehab		20,000	200,000		
Roberts Street				400,000	
407 Highland Avenue			100,000		700,000
St. Johns Avenue				50,000	
Oakridge Avenue from North St to MLK				250,000	
Property Purchases					50,000
Totals	1,068,431	805,000	800,000	975,000	750,000

Source: City of Green Cove Springs Public Works Department

E. POTABLE WATER

1. Regulatory Framework

Federal. The federal government has established quality standards for the protection of water for public use, including operating standards and quality controls for public water systems. These regulations are provided in the Safe Drinking Water Act, Public Law 93-523. This law directed the EPA to establish minimum drinking water standards. The EPA standards are divided into "primary" (those required for public health) and "secondary" (recommended for aesthetic quality) categories.

State. In accordance with federal requirements, the Florida Legislature has adopted the Florida Safe Drinking Water Act, Sections 403.850 - 403.864, F.S. The DEP is the state agency responsible for implementing this act. In this regard, the DEP has promulgated rules classifying and regulating public water systems under Chapter 17-22 of the F.A.C. The primary and secondary standards of the Federal Safe Drinking Water Act are mandatory in Florida.

The SJRWMD is responsible for managing water supplies to meet existing and future demands. Regulation of consumptive use is achieved through a permitting system, through which water resources are allocated among the permitted consumers. The SJRWMD rules pertinent to Clay County are contained in Chapter 40C-2, F.A.C.

Local. The City of Green Cove Springs requires all development to connect with the existing public water supply system. The City's water system consists of two water treatment plants (WTP) that serve the entire Green Cove Springs water and sewer utility service area. The two plants serve the entire area on a looped system. At any given time, either plant should be able to supply water to the entire service area. The water service area extends beyond the northern, western, and southern corporate limits of the City of Green Cove Springs. The northern plant, the Harbor Road WTP (HRWTP), is rated at 1.440 million gallons per day (MGD). The southern plant, the Reynolds WTP (ReyWTP), is rated at 1.728 MGD.

2. Terminology

A potable water supply system normally consists of a water supply source, a treatment plant and a distribution and storage network. Either surface water stored in natural lakes or manmade reservoirs, or groundwater, or some combination of the two; usually constitute the supply source for a system. The selection of a source for any system must consider the type and quality of sources available and the cost of developing the source for use. Before being used for public consumption, most water must be treated. Treatment removes impurities from the raw water in order to improve its quality for either public health or aesthetic reasons, or both. The treatment process adds to the cost of supplying water but is also expands the range of raw water sources that can be utilized.

After treatment, the water is supplied to individual users in a community by way of a network of pipes and storage reservoirs. Large transmission lines, called distribution mains, carry water to major demand areas and interconnect with a network of smaller lines which eventually supply individual establishments. Both the distribution mains and distribution network should be interconnected to form flow loops to allow water to circulate from various portions of the system to areas of highest momentary demand.

Water is delivered under pressure within the distribution system in order to ensure adequate flow to meet demands. Demand fluctuates during each day, usually exhibiting peaks during the morning and evening, corresponding to periods of highest residential use. Localized demand peaks also occur when the system is utilized for fire-fighting purposes. In order to provide adequate storage, tanks are linked with the distribution system at strategic locations. During low demand periods, these tanks are filled as water is pumped into the

system. During the peak demand periods, water flows from the tanks back into the system to augment flows and maintain pressure. Ground level and elevated storage tanks are both commonly used. Elevated tanks (water towers) are the most economical. Many systems also include auxiliary pumps which operate only during peak demand periods.

3. Water Conservation

Water conservation is a priority for the city. Clean drinking water is a precious resource. Efforts to reduce water consumption inside homes and businesses, in addition to reducing water used for irrigation, is a critical component of the City's Mission Statement. A good resource for methods to reduce water consumption, in addition to regulations on irrigation ("watering days/times", etc.) is the St. Johns River Water Management District. The link to their water conservation website is http://www.sjrwmd.com/waterconservation/

The City follows the SJRWMD regulations on irrigation ("watering days/times", etc.) The link to their water restrictions website is: http://www.sjrwmd.com/wateringrestrictions/ .

4. Water Treatment

Water for the City is provided by two water treatment plants, the Harbor Road Water Treatment Facility (WTF) and the Reynolds WTF. The water from these plants is combined to form one system which consists of five wells which pull from the Floridian Aquifer, four ground water storage tanks and three elevated storage tanks (towers). Due to the excellent water quality of the Floridian Aquifer, the water treatment process is limited to aeration and chlorination (disinfection).

5. Potable Water

In 2018 the City completed a Water Master Plan which identified future needs of our water treatment system to include wells, piping and treatment facilities. The City has identified capital projects to enable us to be prepared for the future. In 2019, as a supplement to the Master Plan, the City has completed a Water Rate Study to identify and prioritize projects and the options for financing them.

Harbor Road Water Treatment Plant - The HRWTP was completed in 1973 with one 16" well at approximately 1,100 feet deep that draws from the Floridan Aquifer. The plant consists of the one 16" well with a 40-HP vertical turbine well pump, one tray aerator, one 200,000 gallon ground storage tank, one 200,000 gallon elevated storage tank, two 50-HP high service pumps, and sodium hypochlorite disinfection. Fluoride is also added to the finished water. The 40-HP well pump is rated at 1,800 gallons per minute (gpm) and the high service pumps are each rated at 1,000 gpm. There is also a 75,000 gallon elevated storage tank located in within the city limits, on Bonaventure Ave.

The high service pumps are controlled by variable frequency drives (VFDs). The HRWTP feeds a high-pressure loop that serves Magnolia Point. This loop was installed in 2004 to solve pressure problems in the higher elevation areas of Magnolia Point.

Future outstanding flow commitments for the next five years include:

- Magnolia Point – 87,100 gallons per day (GPD)
- Governors Pointe Condos – 12,700 GPD
- Clay County Utility Authority (reserved per interlocal agreement) – 23,000 GPD
- Exiting platted lots within the City limits, approximately 520 lots – 135,000 GPD

The HRWTP is in need of expansion to maintain an acceptable LOS for our customers. In 2007, the City will install three larger high service pumps, two jockey pumps, a second 16" well and an additional 200,000 gallon ground storage tank. This project will also include a construction of building to house the additional high service pumps, as the existing building is not large enough for the new pumps. This expansion will increase the capacity of the entire system by approximately 1.5 MGD, bringing it to approximately 4.7 MGD. It will increase the firm capacity of the HRWTP to approximately 1.5 MGD. The estimated cost for improvement is $1.6 million and will be funded by grant funds. The project is included in the 2006 – 2011 Capital Improvement Plan.

Other improvements over the past 10 years include upgrades to pumps, electrical systems and tank coating and painting.

Reynolds Water Treatment Plant - The ReyWTP was completed in 1942. It originally had two 6" wells and a third was later added. Each of the wells is approximately 650 feet deep, draws from the Floridan Aquifer, and has a 15-HP split case well pump. The plant also consists of two tray aerators, two 200,000 gallon ground storage tanks, one 250,000 gallon elevated storage tank, three 40-HP high service pumps and sodium hypochlorite disinfection. Fluoride is also added to the finished water.

Future outstanding flow commitments within the next five years include:

- Graylan Oaks Subdivision – 3,120 GPD
- J-M Property Redevelopment – 75,000 GPD
- Bay Street Condos – 2,340 GPD
- Bridge Plate Manufacturing – 1,000 GPD

The ReyWTP is in need of upgrades and expansion to maintain the level of service for current and future customers. The three 6" wells need to be replaced by two 12" or 16" wells capable of producing 1,500 to 1,800 gpm each. The high service pumps need to be upgraded from 400 gpm pumps to 1,000 gpm pumps. These additions would increase the capacity of the entire system by approximately 1.6 MGD increase. This estimated cost for this project would be around $2.0 million and is included in the 2006-2011 Capital Improvements Program

Distribution Facilities Lines - A large portion of our distribution system consists of asbestos cement lines that were installed in 1972. Most of the remainder of the lines are PVC. There are still some galvanized and iron pipes in service. The City of Green Cove Springs has approximately 3700 water meters and approximately 400 fire hydrants in service.

All of the remaining galvanized and iron lines will need to be replaced are in need of replacement due to their deteriorated condition in the next five years. The asbestos cement lines will also need to be replaced within the next five years because they are very easily subject to breakage due to tree roots, construction, or any other minor disturbances.

Master Plan - In 2018, Mittauer and Associates, Inc. completed a Water Facilities Plan for the City. The plan provides a phased approach to increasing the total system capacity to meet the projected demands within the service area through the year 2040. The HRWTP improvements would add 1.5 MGD. The Reynolds WTP improvements would add 1.6 MGD. These two improvements would bring our total system capacity to 6.3 MGD.

Other improvements over the past 10 years include upgrades to pumps, electrical systems and tank coating and painting.

6. Population Projections

This chart shows the population projections and projected flow for our service area.

Table IV-9. Potable Water – Projected Flow

Year	Service Area Population*	LOS per capita (GPD)	Total Projected Flow (MGD)
2025	11,860	150	1.779
2030	14,150	150	2.1225
2035	15,300	150	2.295
2040	18,360	150	2.754

Source: City of Green Cove Springs, Mittauer & Associates

**Service Area Population includes the population in the City limits and portions of unincorporated Clay County which are within the Utility Service Area.*

7. Description of Existing Service Area Based on Land Uses

The City currently serves the entire City Limits, except the 163 acres known as Magnolia West, annexed in 1998 and developed as a single family subdivision containing approximately 535 homes, that is served by CCUA with potable water. The recently (2021) annexed Ayrshire development, a proposed 2,100-unit residential subdivision containing approximately 560 acres, will also be served by CCUA.

The primary land uses within the utility service area are residential, commercial and industrial. Residential accounts make up approximately 84% of the total number of accounts, while non-residential accounts comprise approximately 16%. Future development within the City's service area will continue to be served by the existing City system. It is projected that the utilities shall be adequate to serve a substantially larger population than what is projected through 2040. Despite the larger percentage of residential accounts than non-residential accounts, residential customers account for only approximately 55% of the water sold because of the high demand of commercial and industrial users.

In addition to providing water within its service area, the City provides water to the Food Lion grocery warehouse located approximately 3 miles south of Green Cove Springs and to Clay High School located one-half mile west on State Road 16. The service area consists of 3 basic regions: the Core City service region, the Reynolds Park area, and Magnolia Point.

The Core City service region exerts the greatest water demand of the 3 regions and is bounded by the St. Johns River on the east, Governors Creek on the north and west, and Green Cove Avenue and Cooks Lane on the south. The Reynolds Industrial Park area is located southeast of the Core City region. This area is an Industrial Park annexed by the City in 1979. The area encompasses approximately 1,538 acres. Magnolia Point is a golf course and country club development located north of the City's original city limits on the north side of Governors Creek.

8. Capacity & Facility Assessment

Future potable water needs were projected based on historical data in regard to average day and maximum day factors. The average day factor is an estimate of the demand of the resident population on an average day. The maximum day factor is an estimate of the demand of the resident population to represent peak demand. The City must be able to produce enough raw water in order to meet the average day demand. On days when the demand is below this average demand, water will be stored in the storage tanks. In order to

meet maximum day demand, however, the ability of the City to treat and pump the treated water through the distribution system is a must. If demand exceeds the raw production on the maximum day, the City must then draw on the water in the storage tanks. Based on the 2020 annual analysis, the City averages 124 gallons per capita per day (gpcd).

The most recent Sanitary Survey Report for Drinking Water Systems conducted by the Florida Department of Environmental Regulation, found the City's potable water system to be in good condition. There is sufficient plant capacity to serve the population through the year 2040.

9. Consumptive Use Permit

The City of Green Cove Springs is operating under a consumptive use with the St. Johns River Water River Water Management District for the withdrawal of water from the permitted wells operated by the City of Green Cove Springs. The consumptive use permit is in force beyond the planning period. The permit will expire in 2024.

Table IV-10. Consumptive Use Permit – Allowed Withdrawal Schedule

Year	Permitted Withdrawal (MGD)
2020	770.88
2024	779.28

Source: City of Green Cove Springs Public Works Department

10. Impact on Adjacent Natural Resources

The primary source of water for Green Cove Springs and Clay County is the Floridan Aquifer. The aquifer extends throughout all of Northeast Florida and Southeast Georgia. Recharge to the aquifer occurs in southwestern Clay County through sinkholes and lakes that are connected to the aquifer in the Keystone Heights region. According to the SJRWMD, there are no high groundwater recharge areas for the Floridan Aquifer in Green Cove Springs.

Some potential impacts of any water facilities on natural resources could include the following:

- Contamination of the Areas of Influence around Wellheads
- Over Pumpage of Groundwater
- Development of Prime Recharge Areas
- Seepage of Contaminants Such as Hazardous or Toxic Substances into the Soil

The land uses within 200 feet of the wellheads do not include any known hazardous waste generators. In terms of water pumpage, Green Cove Springs average withdrawal in 2020 was approximately 1.376 million gallons per day. Pursuant to the population table projections, the projected flow would be 2.479 mgd which is the Current CUP allocation of 2.135. The City shall need to explore alternative water supply sources in order to accommodate the expected growth. There is no data known which would indicate that a cone of influence has occurred in Green Cove Springs as it relates to the amount of water withdrawn. However, Green Cove Springs should seek ways to encourage reduced water withdrawals by possibly establishing incentives for heavy industrial and commercial water users to reduce and/or reuse non-contaminated water.

The City, like all cities and counties in the SJRWMD, is under water restrictions at the present time due to the lack of consistent rainfall in the area. The Land Development Regulations should require new development

be required to install low water use devices for items such as showers, toilets, etc. Additionally, developments should be encouraged to use native, drought resistant, vegetation for landscaping purposes.

Development of prime recharge areas is also considered to affect the groundwater resources because it hampers rainfall from entering the aquifer(s). However, in Green Cove Springs there are no prime recharge areas to the Floridan aquifer and inconclusive evidence of recharge to the Surficial aquifer.

The fourth potential adverse impact to natural resources would be the occurrence of hazardous or toxic substances seeping into soils. A review of the DEP hazardous waste files indicates there are several potential hazardous waste sites and hazardous waste generators in the City of Green Cove Springs (see listing and discussion of these sites in the Solid Waste Sub-Element).

Since there has been no hydrogeologic study conducted to determine the cone of influence around the City's wells, the City will need to utilize a standard protection buffer of 200 feet of the public potable water wellheads. The buffer around the wellheads will be necessary to prevent potentially hazardous waste from being stored, manufactured, or disposed of within these areas.

Further measures the City needs to undertake is to require commercial establishments which use, treat, store, generate or transport toxic or hazardous substances, to prepare a plan which identifies the materials, how the materials will be handled, and how they will be disposed of.

F. AQUIFER RECHARGE

1. Regulatory Framework

Federal. In 1986, the Federal Safe Drinking Water Act (PL 93-523) was amended to strengthen protection of public water system wellfields and aquifers that are the sole source of drinking water for a community. The amendments for wellfield protection require states to work with local governments to map wellhead areas and develop land use controls that will provide long-term protection from contamination for these areas. The aquifer protection amendments require the EPA to develop criteria for selecting critical aquifer protection areas. The program calls for state and local governments to map these areas and develop protection plans, subject to the EPA review and approval. Once a plan is approved, the EPA may enter into an agreement with the local government to implement the plan. As of this writing, the EPA has not completed development of the criteria needed to implement this program.

State. In implementing the Florida Safe Drinking Water Act (Ch. 403, F.S.), the DER has developed rules classifying aquifers and regulating their use (Chapter 62-3230, Part III, F.A.C.). These rules are currently being amended to strengthen protection of sole source aquifers and wellfields tapping them. The DER has also established regulatory requirements for facilities which discharge to groundwater (Section 62-330, F.A.C.) and which inject materials directly underground (Chapter 62-330, F.A.C.).

The task of identifying the nature and extent of groundwater resources available within the state has been delegated to the regional water management districts. Each district must prepare and make available to local governments a Groundwater Basin Resource Availability Inventory (GWBRAI), which the local governments are to use to plan for future development in a manner which reflects the limits of available resources. The Criteria for the inventories, and legislative intent for their use, are found in Chapter 373, Florida Statutes.

The governing boards of the St. Johns River and Suwannee River water management districts on Jan. 17, 2017, jointly approved the North Florida Regional Water Supply Plan (NFRWSP). The approved NFRWSP, appendices and orders approving the plan can be downloaded below.

The Regional Water supply plan covered a 20-year planning period and was based on the best data and research available at that time. The City has and will incorporate the alternative water supply projects into the Comprehensive Plan

The Water Management Districts are to develop a ground water basin resource availability inventory which includes a hydrogeologic study to define the groundwater basin and its associated recharge areas; areas in the basin which are prone to contamination or overdraft; prime groundwater recharge areas; development of minimum seasonal surface and groundwater levels; areas suitable for future water resource development within the groundwater basin; existing sources of wastewater discharge suitable for reuse; and potential quantities of water available for consumptive uses.

The inventory is then to be reviewed by the affected municipalities, counties, and regional planning agencies for consistency with the local government comprehensive plan and shall be considered in future revisions of such plans. The intent of the Legislature is to ensure future growth and development planning reflects the limitations of the available groundwater or other available water supplies (Sec. 373.0395, F.S.). The SJRWMD has just recently completed the GWBRAI.

Local. Neither Green Cove Springs nor Clay County has any special regulatory programs for protecting groundwater recharge areas.

The City of Green Cove Springs has not adopted specific programs to protect natural groundwater recharge areas. However, the City's potential for having aquifer recharge areas for the Floridan aquifer is thought to be non-existent, according to the SJRWMD. Recharge to the surficial aquifer is unknown and undocumented. Therefore, it does not appear appropriate to implement "Recharge Protection" measures at this time.

If the SJRWMD finds groundwater recharge does occur in the City of Green Cove Springs, the City will need to amend the comprehensive plan to identify and protect those areas.

2. Terminology

Aquifers are water-bearing layers of porous rock, sand or gravel. Several aquifers may be present below 1 surface location, separated by confining layers of materials, which are impermeable or semi- permeable to water.

The source of water in aquifers is rainfall. Under the force of gravity, rainfall percolates downward through porous surface soils to enter the aquifer strata. Because of the variable permeability of different soil types, the rate of aquifer recharge from rainfall may vary from one location to another. The areas of highest recharge potential are called prime recharge areas. The presence of overlying confining beds also determines which surface areas will be effective recharge areas for a given aquifer, and is another factor in identifying prime recharge areas for the aquifer.

Since aquifer recharge areas are surface features, they are subject to alteration by development. Covering a recharge area with impervious surfaces, such as roads, parking lots and buildings reduces the area available for rainfall percolation, altering the total rate and volume of recharge in that area. Increasing the rate at which stormwater drains from recharge area surfaces also decreases recharge potential.

A second concern related to development within aquifer recharge areas is the potential for contamination of groundwater within the aquifer. Just as with stormwater runoff to surface waters, pollutants picked up by runoff, which enters an aquifer, can degrade the quality of the groundwater. Since water flows within an aquifer in a manner similar to surface water flow, downstream portions of the groundwater may be polluted over time. This becomes particularly significant when the aquifer is tapped as a potable water supply downstream.

3. Existing Conditions

The principle source of potable water in Green Cove Springs, as in most of northeast Florida, is the Floridan Aquifer. Water, generally under artisan pressure, occurs in layers of limestone and sand in the Hawthorne Formation and in limestone layers and shellbeds in the Choctawhatchee Formation.

The uppermost aquifer in Clay County is the water table aquifer which consists primarily of sand and clay sands. Potential well yields from the water table aquifer depend on the thickness and nature of the aquifer. Thick beds of relatively course sand will yield considerably more water than beds, which contain large quantities of water for domestic and stock purposes. Individual water-bearing zones range in thickness from a few inches to several feet, and the entire sequence in Clay County is 150 to 250 feet thick.

4. Floridian Aquifer

Recharge to the Floridan Aquifer does not occur in Green Cove Springs. It does, however, occur in southwest Clay County in the Keystone Heights lake region. In this area, the potentiometric surface is below the water table, and water moves downward from the water table through the semi- permeable confining beds and into the Floridan Aquifer. Water quality tests conducted by the U.S. Geological Survey have found water in Clay County is of good chemical quality and has not changed noticeably.

5. Surficial Aquifer

To date, there have been no studies conducted which would determine if recharge occurs in Green Cove Springs. To determine if recharge to the surficial aquifer occurs in a location, the SJRWMD recommends looking at the type of soils in the area if there is no other data available. The type of soil is a factor for recharge because of drainage qualities, which may allow seepage of stormwater.