Countywide Water and Wastewater Master Plan

Effingham County, Georgia

EFFINGHAM COUNTY EST. 1777 GEORGIA

ALLIANCE CONSULTING ENGINEERS

Volume 1 of 2

COUNTYWIDE WATER AND WASTEWATER MASTER PLAN

EFFINGHAM COUNTY, GEORGIA

Prepared For:
Effingham County
804 South Laurel Street
Springfield, Georgia 31329

July 2023

COUNTYWIDE WATER AND WASTEWATER MASTER PLAN

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Prepared For:
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804 South Laurel Street
Springfield, Georgia 31329

Prepared By:
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Project No. 21162-2051
July 2023

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1 EXECUTIVE SUMMARY

Growth in Effingham County has accelerated in recent years. Over the last five (5) years, the County has averaged over five hundred (500) new homes constructed each year with the trend expected to continue. Currently, Effingham County has approximately 3,500 unbuilt home sites approved with zoning change requests for new developments coming in monthly. That equates to a housing trend that will extend seven (7) years and further into the next decades[1]. In addition, in May 2022, Hyundai Motor Group announced an approximately $5.5 billion project to construct its first fully dedicated Electric Vehicle (EV) and Battery Manufacturing Facility on the approximately 3,000-Acre Bryan County Megasite, approximately six (6) miles from Effingham County. Hyundai Motor Group's suppliers will invest another approximately $1 billion in the project, delivering an estimated 8,100 new jobs to Georgia's Coastal Region.

Effingham County, in its vision for the future well-being and quality of life for its citizens and to be prepared for continued residential and economic growth in the County, commissioned Alliance Consulting Engineers, Inc. to undertake the task of evaluating the current condition of its Public Water and Wastewater Systems, including the Wastewater Effluent Re-Use Distribution System, within the County, as well as the other municipal Water and Wastewater Systems in the County, as available. Development of adequate Water and Wastewater Infrastructure is a necessary component in the successful growth of Industrial, Commercial, and Residential Development throughout Effingham County. Effingham County currently has four (4) individual Public Water and Wastewater Service Providers: Effingham County, the City of Springfield, the City of Rincon, and the City of Guyton. Each of the Public Water Systems is individually responsible for its own supply, treatment, storage, and/or distribution of potable water, and each of the Public Wastewater Systems is individually responsible for the collection, conveyance, treatment, and discharge of wastewater. Public Wastewater service is not provided in Effingham County north of the City of Springfield. The northern portion of Effingham County is comprised largely of agricultural and agricultural residential development, based on the Existing Land Use Map published by Effingham County on July 25, 2019.

As a part of this Countywide Water and Wastewater Master Plan, Alliance Consulting Engineers, Inc. completed a review of the existing conditions of the Public Water and Wastewater Systems within the County through information obtained from County and City Officials and Publicly Available Databases. Alliance Consulting Engineers, Inc. then prepared Water Demand and Wastewater Generation Projections based on population data and projected areas for development and growth. Based on the projected Water demand, Alliance Consulting Engineers, Inc. assessed the current water supply, storage, and distribution plans to ensure they are adequate for the growth

[1] Source: Effingham County Building permit records and Planning Agenda records.

anticipated throughout the County, and to provide recommendations for improvements where the current system is inadequate. Alliance Consulting Engineers, Inc. also assessed the current wastewater treatment capacity and provided recommendations for improvements to ensure the system is adequate for the growth anticipated throughout the County. This Countywide Water and Wastewater Evaluation will also take into consideration the feasibility of regionalization of the Water and Wastewater Systems in the County.

Many of the findings of this study have already been or are in the process of being implemented as Effingham County has been aggressively pursuing Water and Wastewater Improvements to keep up with the rapid growth in the County as well as to continue to position itself for future growth. The most critical of these is continued focus on Water Supply, Water Storage, Wastewater Treatment and Wastewater Disposal capacities, as Effingham County should have a plan in place to control its future Water and Wastewater Services.

2 INTRODUCTION AND OBJECTIVES

Effingham County is located in the southeastern portion of Georgia, bordered by Chatham County to the south, Bryan County and Bulloch County to the west, Screven County to the north, and the Savannah River to the east. Municipalities within Effingham County include the City of Guyton, the City of Rincon, and the City of Springfield, which is the County seat. An Overall Map of Effingham County and its municipalities is included in **Exhibit A – County Overview Map**. Site Location Maps, Aerial Maps, National Wetland Inventory (NWI) Maps, and FEMA Flood Maps of each of these municipalities and their surrounding vicinities are included in **Appendix A**. The County Overview Map illustrates that Interstate 16 traverses across the southwestern boundary of Effingham County and that GA Highway 21, GA Highway 17, and GA Highway 119 are the major highways that serve Effingham County.

The majority of development located within Effingham County is located in the southern region of Effingham County along the Interstate 16 and GA Highway 21 corridor. Effingham County anticipates that population and development will continue to increase in this region of the County. Development of adequate water, wastewater, and wastewater effluent discharge and re-use service is a requirement for future residential, commercial, and industrial development throughout the southern region of Effingham County. Regionalized water and wastewater service, coupled with additional and improved facilities needed to support the regional service, would help to support further industrial and economic development in Effingham County.

2.1 Study Area

The initial step in evaluating the Water and Wastewater Systems and Service for Effingham County is to define the study area and existing service regions for the County and Municipalities. The municipalities of Springfield, Rincon, and Guyton each own, operate, and maintain water supply, treatment, storage, and distribution systems. Additionally, Effingham County owns, operates, and maintains its own water supply, treatment, storage, and distribution systems. Effingham County and the municipalities of Springfield, Rincon, and Guyton also own, operate, and maintain wastewater collection systems and their associated treatment facilities. The municipalities' service territories extend to water and wastewater customers outside the municipal limits, essentially dividing Effingham County's service territory into the northern portion of the County and the southern portion of the County. This report will focus the Study Area on the municipalities' service territories and the County's service territory in the southern portion of the County where growth and demand for water and wastewater services are most critical. The existing water and wastewater service

NOTE: BOUNDARIES, TOPOGRAPHY, WETLANDS, AND STREAMS LOCATIONS ARE APPROXIMATE BASED OFF GEOGRAPHIC INFORMATION SYSTEMS (GIS). A BOUNDARY AND TOPOGRAPHIC SURVEY ALONG WITH A WETLAND DELINEATION SHOULD BE PERFORMED TO DETERMINE ACCURATE BOUNDARY, TOPOGRAPHIC, AND WETLAND LOCATIONS.

EXHIBIT A

0 2,500 5,000 10,000

(IN FEET)

County Overview Map
Water and Wastewater Master Plan
Effingham County, Georgia

Project No.: 21162-2051
August 27, 2021

Prepared by
Alliance Consulting Engineers, Inc.

territories of Effingham County are illustrated in the County Service Territory Map (**Exhibit B)**.

2.2 Population and Trends

Population and economic growth are major factors affecting Water and Wastewater Systems and the facilities required to meet public demand for Water and Wastewater Service. The US Census Bureau estimated Effingham County's population as 64,296 (July 1, 2019) with a percent population change from April 1, 2010 to July 1, 2019 of approximately 23%. Effingham County's Population growth is anticipated to be from new residents as Effingham County has very few seasonal workers. According to the 2019 Census Estimate, approximately 47,625 persons are located within the unincorporated region of Effingham County. The water distribution system, wastewater collection system, and their associated treatment facilities serving the unincorporated areas of Effingham County are owned, operated, and maintained by the County.

The City of Springfield is the County seat of Effingham County and is located in the central portion of the County near the intersection of Georgia Highway 21 and Georgia Highway 119. According to the 2019 Census Estimate, the City of Springfield had an estimated population of 4,084 persons within approximately 3.08 square miles. The water distribution system, wastewater collection system, and the associated treatment facilities serving the City of Springfield's water and wastewater customers are owned, operated, and maintained by the City of Springfield.

The City of Rincon is located southeast of the City of Springfield and is located in the southeastern portion of the County along Georgia Highway 21. According to the 2019 Census Estimate, the City of Rincon had an estimated population of 10,361 persons within approximately 9.74 square miles. The water distribution system, wastewater collection system, and the associated treatment facilities serving the City of Rincon's water and wastewater customers are owned, operated, and maintained by the City of Rincon.

The City of Guyton is located west of the City of Springfield and is located in the western portion of the County near the intersection of Georgia Highway 17 and Georgia Highway 119. According to the 2019 Census Estimate, the City of Guyton had an estimated population of 2,226 persons within approximately 3.22 square miles. The water distribution system, wastewater collection system, and the associated treatment facilities serving the City of Guyton's water and wastewater customers are owned, operated, and maintained by the City of Guyton.

GEORGIA

SCREVEN COUNTY

SOUTH CAROLINA

EFFINGHAM COUNTY
SERVICE AREA

21

119

17

21

CITY OF SPRINGFIELD

119

275

CITY OF GUYTON

BULLOCH COUNTY

CITY OF RINCON

21

17

EFFINGHAM COUNTY
SERVICE AREA

30

17

80

BRYAN COUNTY

16

CHATHAM COUNTY

SAVANNAH
INTERNATIONAL AIRPORT

95

NOTE: BOUNDARIES, TOPOGRAPHY, WETLANDS, AND STREAMS LOCATIONS ARE APPROXIMATE BASED OFF GEOGRAPHIC INFORMATION SYSTEMS (GIS). A BOUNDARY AND TOPOGRAPHIC SURVEY ALONG WITH A WETLAND DELINEATION SHOULD BE PERFORMED TO DETERMINE ACCURATE BOUNDARY, TOPOGRAPHIC, AND WETLAND LOCATIONS.

EXHIBIT B

0 2,500 5,000 10,000

(IN FEET)

N

Service Territories
Water and Wastewater Master Plan
Effingham County, Georgia

Project No.: 21162-2051
September 30, 2021

EFFINGHAM COUNTY EST. 1777 GEORGIA

ALLIANCE CONSULTING ENGINEERS

Prepared by
Alliance Consulting Engineers, Inc.

The US Census Bureau produces July 1st population estimates for each year after the last published decennial census, as well as past decades. These population estimates are used to project the population of a given area for future years. It must be noted that these projections of future population are based solely on census data and do not reflect characteristics such as fertility, mortality, or migration of the actual population within the county. As illustrated in **Table 1**, according to the Georgia Governor's Office of Planning and Budget, the County's population will increase from 64,296 in 2019 to 86,640 in 2031 (approximately + 35%) and to 105,378 in 2041 (approximately + 64%).

Table 1: Effingham County Population Projections (2019 – 2041)

Year	Population
2019	64,296
2020	65,869
2021	67,443
2022	69,017
2023	70,585
2024	72,158
2025	74,425
2026	76,692
2027	78,944
2028	81,214
2029	83,474
2030	85,054
2031	86,640
2032	88,228
2033	89,823
2034	91,400
2035	93,445
2036	95,485
2037	97,536
2038	99,569
2039	101,608
2040	103,498
2041	105,378

Source: Governor's Office of Planning and Budget, Series 2020

Based upon the current population trends in the County, it is expected that the largest area of growth in the County will be in the municipalities located within the County and their surrounding areas. As a result, the County should see an increase in its Water and Wastewater Service Demand from these areas. Projected Water and Wastewater Service Demand Data will be discussed in Section 5 – Water Demand and Wastewater Flow Projections.

2.3 Land Use

While Effingham County is currently experiencing significant urban growth, the land use is primarily agricultural and wooded. Effingham County is primarily rural with a majority of the land use being agricultural. Residential Development is concentrated within the incorporated areas in Effingham County, the City of Guyton, the City of Rincon, and the City of Springfield, and in the southern portion of the County near the City of Savannah, Chatham County. As the County continues to grow, the County is able to support a variety of Industrial and Commercial Development. The County's largest manufacturers include: International Paper, Doncaster's, Inc., Georgia Pacific – Savannah River Mill, Edwards Interiors, Georgia Transformer, Interfor – Meldrim Division, AeroDynamic Aviation, and DRT America. In addition, Effingham County is home to several Logistics and Distribution Companies including: Lineage Logistics, Americold, Shaw Industries, Perdue, and A&R Logistics. Per the US Census Bureau, 2020, approximately 9,421 residents live and work in Effingham County. An additional 2,897 persons commute into the County, and 20,781 residents commute outside of the County.

The Effingham County Industrial Development Authority continues to expand and promote industrial development in the County, and currently has five (5) industrial parks listed with availability. Effingham County's proximity to the Port of Savannah, approximately eight (8) miles, Interstate I-95 and I-16, GA Highway 21, proximity to the Savannah-Hilton Head International Airport and Hartsfield-Jackson Atlanta International Airport, and Class I Rail Connections make the County desirable for business growth.

The Cities of Guyton, Rincon, and Springfield include mostly residential development; however, commercial development such as service stations, locally owned grocery stores, medical facilities, restaurants, dollar department stores, banks, and other locally owned small businesses are also located throughout the incorporated areas of Effingham County. The City of Rincon, the largest incorporated City in the County serves as the retail center of Effingham County. The City of Rincon is home to larger retailers such as Wal-Mart Supercenter, Lowe's Home Improvement, chain grocery stores, furniture stores, warehouses, fast food, and other restaurants, utility companies, and automobile dealerships.

3 EXISTING WATER SYSTEM INFORMATION

The existing public water systems within Effingham County consist of four (4) operating systems: Effingham County, City of Springfield, City of Rincon, and the City of Guyton. These Public Water Systems serve approximately 26,441 persons across Effingham County, based on the Georgia Environmental Protection Division (EPD) Active Permitted Drinking Water System List dated November 2020. The EPD Active Permitted Drinking Water System List indicates that 18,406 people are served by private water systems, which include South Atlantic Utilities, Chatham Water, Middle Georgia Water, Coastal Georgia Water & Sewer, and Lakeside Water. The remaining population in Effingham County, approximately 19,449 people, are assumed to be served by private water wells. This report will only discuss the existing water system information for the public water systems in Effingham County.

3.1 Effingham County

Effingham County supplies drinking water from two (2) different sources, groundwater wells that withdraw from the Upper Floridan Aquifer and treated surface water purchased from the City of Savannah. The majority of Effingham County Water customers receive water from the Savannah Industrial & Domestic (I&D) Plant, Water System Identification Number (WSID #) 0510004, while smaller outlying developments are supplied by the groundwater well systems.

3.1.1 Service Area and Customer Base

Effingham County provides water service to the unincorporated areas of Effingham County. The majority of water service is supplied to the unincorporated area of Effingham County south of the incorporated areas. **Table 2** below summarizes the Georgia EPD's Active Permitted Drinking Water Systems List updated November 2020 for Effingham County.

Table 2: Effingham County Active Water System Permits			
Name	**WSID**	**Type**	**Population Served**
Berryville (fka Indigo Woods)	GA1030152	Groundwater	26
Southbrook Subdivision	GA1030161	Groundwater	47
Springfield Central Elementary	GA103006	Groundwater	50
Effingham County IDA / I-16 Industrial Park	GA1030159	Groundwater	25
Courthouse Road	GA1030154	Groundwater	26
Hunter's Chase / Abby Lane	GA1030146	Groundwater	211
Greenbriar Subdivision	GA1030160	Groundwater	78
Effingham County Surface Water System	GA1030131	Surface Water	9,869

Source: Georgia EPD Drinking Water / Public Water System Permit List dated November 2020

3.1.2 Water Supply and Treatment

Potable Water is supplied to Effingham County from groundwater wells and surface water purchased from the City of Savannah. Effingham County's Groundwater Withdrawal Permit (051-011) indicates the Permit Limit Yearly Average is 0.371 Million Gallons per Day (MGD) and that the Permit Limit Monthly Average is 0.539 MGD. The Savannah Industrial & Domestic Water System Surface Water Withdrawal Permit (051-0115-01) indicates the Permit Limit Daily Maximum is 55 MGD and the Permit Limit Monthly Average is 50 MGD.

Effingham County Board of Commissioners entered into an Agreement dated April 1, 2002 (Appendix B) with the City of Savannah to purchase potable water and to construct a 36-inch water line from Chatham County to the Effingham County Power, LLC (ECP) Site in Effingham County. The capacity of this water line was intended to meet the needs of ECP and provide additional capacity to meet water needs of domestic customers within Effingham County. The Maximum Flow Rate of the 36-inch water main was initially set at 5,600 gallons per minute (GPM) and can be increased by 700 gallons per minute for each additional 1 MGD reserved, up to 12.5 MGD. The Maximum Monthly Average was initially set at four (4) MGD with the ability to increase to up to eight (8) MGD. The Agreement sets forth the maximum amount of water reserved to Effingham County, which may be increased in increments of 1 MGD up to 12.5 MGD, for an overall maximum total available under the

Agreement of 20.5 MGD. Effingham County was supplied approximately 986 Million Gallons per Year (MG/Yr) from January 2020 to December 2020. Of that amount, approximately 953 MG/Yr was from authorized consumption, while approximately 33 MG/Yr was from water losses. The Maximum Flow Rate of the 36-inch water main is approximately 14,500 GPM, equivalent to 20.5 MGD.

Potable Water purchased from the City of Savannah is treated prior to distribution to Effingham County via the 36-inch water main at the Savannah I&D Plant. The Savannah I&D Plant located at 1 Water Filtration Plant Road in Port Wentworth, Georgia treats surface water withdrawn from Abercorn Creek, a tributary of the Savannah River. The raw water from Abercorn Creek undergoes treatment consisting of coagulation, flocculation, sedimentation, filtration, and disinfection. Alum and polymer (coagulants) are added to the water to remove dirt and other particles suspended in the source water. The source water is flocculated by gentle, constant mixing to consolidate the solids in the water to be settled out of the water in a sedimentation basin. The clear water is then filtered through sand, gravel, charcoal, and other filters to remove smaller particles. Chloramines are then added to the water as a disinfectant prior to storage and distribution of the water.

Potable Water withdrawn from each of the seven (7) groundwater wells mentioned above are treated at their source prior to distribution. Groundwater withdrawn from the Upper Floridian Aquifer at each of the groundwater wells is disinfected with sodium hypochlorite at the well head prior to distribution.

The locations of the eight (8) existing Water Treatment Facilities are depicted in **Exhibit C**.

3.1.3 Water Storage

Effingham County currently has one (1) elevated water storage tank that provides the pressure needed to supply water throughout the system. Additional information about this tank is presented in **Table 3**.

The location of the tank is depicted in **Exhibit C** of this report.

Table 3: Effingham County Water Storage

Tank	Tank Type	Estimated Overflow (FT – MSL)	Volume (Gallons)
GTIC	Elevated	169’-6”	501,417
Industrial Park	Elevated	177’-0”	120,000

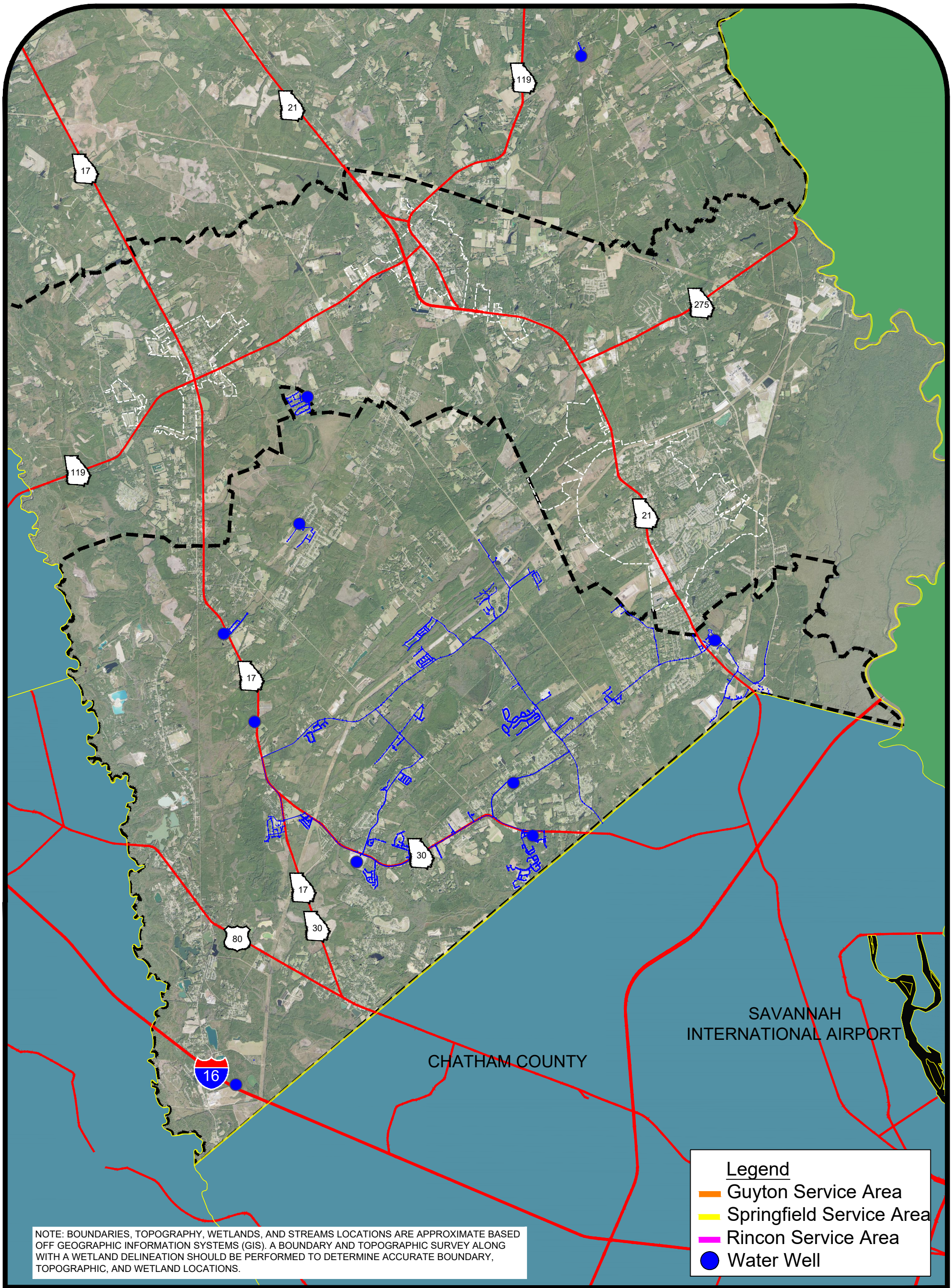

EXHIBIT C

0 1,000 2,000 4,000

(IN FEET)

Effingham County
Water Service Area Map
Water and Wastewater Master Plan
Effingham County, Georgia

Project No.: 21162-2051
September 30, 2021

Prepared by
Alliance Consulting Engineers, Inc.

3.1.4 Planned Future Water Improvements

Effingham County's 2022 Budget included a Capital Improvements Plan (CIP). Effingham County has funding for Water System Improvements outlined in Table 4 below.

Table 4: Effingham County Planned Water Improvements

Project Description	Estimated Expenditure
Replace Approximately 2,500 Water Meters	$262,500
New Mobile Bypass Pump	$65,000
EPD Required Well Cleaning for 2 Backup Wells	$10,000
Water Loop A and B Looping Extension Construction	$5,300,000
Water Loop A and B Looping Extension Engineering	$60,000
Booster Pump Station Construction to Improve Water Pressure	$1,450,000
Booster Pump Station Engineering	$50,000

Effingham County is currently in the process of completing the Water Loop A and B Improvements. Water Loop A consists of the installation of a Sixteen (16)-Inch Water Line to connect to the existing Sixteen (16)-Inch Water Line located at Blandford Elementary School on McCall Road, which is anticipated to be completed in September 2021. Water Loop B consists of the installation of a Sixteen (16)-Inch Water Line to connect to the existing Sixteen (16)-Inch Water Line located near Emerald Crossing Subdivision, which is anticipated to be completed in 2023. Effingham County is also currently in the process of completing construction of a new booster pump station adjacent to the City of Savannah meter to increase water pressure throughout the County. This is anticipated to be completed by April 2023. Effingham County has no additional plans for expansion of the water service area and no planned improvements to increase their capacity that are currently under consideration.

3.1.5 Rate and Fee Schedule

Effingham County has developed a Rate and Fee Schedule based on usage and customer designation. A complete Rate and Fee Schedule can be found in **Appendix B,** and a summarized version can be found in Table 5.

Table 5: Effingham County Water Rate Schedule				
Customer Type	**Base Rate**	**1,000 Gal – 5,000 Gal**	**5,000 Gal – 10,000 Gal**	**Over 10,000 Gal**
Residential	$10.00	$2.44 per 1,000-gal	$2.66 per 1,000 gal	$2.88 per 1,000-gal
Commercial/ Industrial	$50.00	$3.00 per 1,000-gal	$4.00 per 1,000-gal	$5.00 per 1,000 gal

The United States Census estimates 2.84 persons per household (2015 – 2019) for Effingham County. The United States Geological Service (USGS) reports that the domestic per capita use for public-supplied water in Effingham County was 100 gallons per person per day; therefore, the average monthly usage per Effingham County residential water customer would be expected to be approximately 8,520 gallons per month. Based on this, a residence located within Effingham County would be charged a monthly bill of $31.56.

3.1.6 Financial Position

Effingham County has an Audited Financial Statement completed at the end of each fiscal year to assess its financial position created over the previous twelve (12) months of operation. Effingham County has the Audited Financial Statement organized such that the Water and Wastewater Operations are assessed jointly. A summarized version of the 2020 Audited Financial Statement pertaining to the public water and wastewater system can be found in Table 6, and the complete 2020 Audited Financial Statement can be found in **Appendix B**.

Table 6: Effingham County 2020 Financial Statement	
Operating Revenues	$3,650,344
Operating Expenses	$3,281,058
Non-Operating Expenses	($357,574)
Income	$11,712
Capital Contributions and Cost Recovery Fees	$834,546
Transfers-In	$401,033
Change in Net Position	$1,247,291
Net Position, Beginning of the Year	$10,177,939
Net Position, End of the Year	$11,425,230

Based on the 2020 Financial Statement, Effingham County reported a Net Gain, largely due to capital contributions and cost recovery fees and transfers in.

3.2 City of Springfield

3.2.1 Service Area and Customer Base

The City of Springfield provides water service to customers within the city limits and outside city limits, as shown on the City of Springfield Water Service Area Map (Exhibit D). Table 7 below summarizes the Georgia EPD's Active Permitted Drinking Water Systems List updated November 2020 for the City of Springfield.

Table 7: City of Springfield Active Water System Permits

Name	WSID	Type	Water Customers Served
Springfield	GA1030002	Groundwater	2,123
Long Acres Road Subdivision	GA1030149	Groundwater	

Source: Georgia EPD Drinking Water / Public Water System Permit List dated November 2020

3.2.2 Water Supply and Treatment

Potable Water is supplied to the City of Springfield from one (1) groundwater wells that sources water from the Floridian Aquifer. The City of Springfield's Groundwater Withdrawal Permit (051-0012) indicates the Permit Limit Yearly Average is 1.2 Million Gallons per Day (MGD) and that the Permit Limit Monthly Average is 1.2 MGD. Water production for the City of Springfield averaged approximately 0.635 MGD and peaked at approximately 0.787 MGD in 2020.

Potable Water withdrawn from the groundwater well mentioned above is treated at their source prior to distribution. Groundwater withdrawn from the Floridian Aquifer at the groundwater well is disinfected with chlorine at the well head prior to distribution. Fluoride is also added to the water for dental purposes. The locations of the Groundwater Wells are depicted in **Exhibit D**.

3.2.3 Water Storage

The City of Springfield currently has one (1) elevated water storage tank that provides the pressure needed to supply water throughout the system. Additional information about this tank is presented in **Table 8**. The location of the tank is depicted in **Exhibit D** of this report.

Table 8: City of Springfield Water Storage

Name	Type	Estimated Overflow (FT – MSL)	Volume (Gallons)
First Street Ext (Tank 1)	Elevated	205.75	250,000
Industrial Park (Tank 2)	Elevated	205.60	500,000

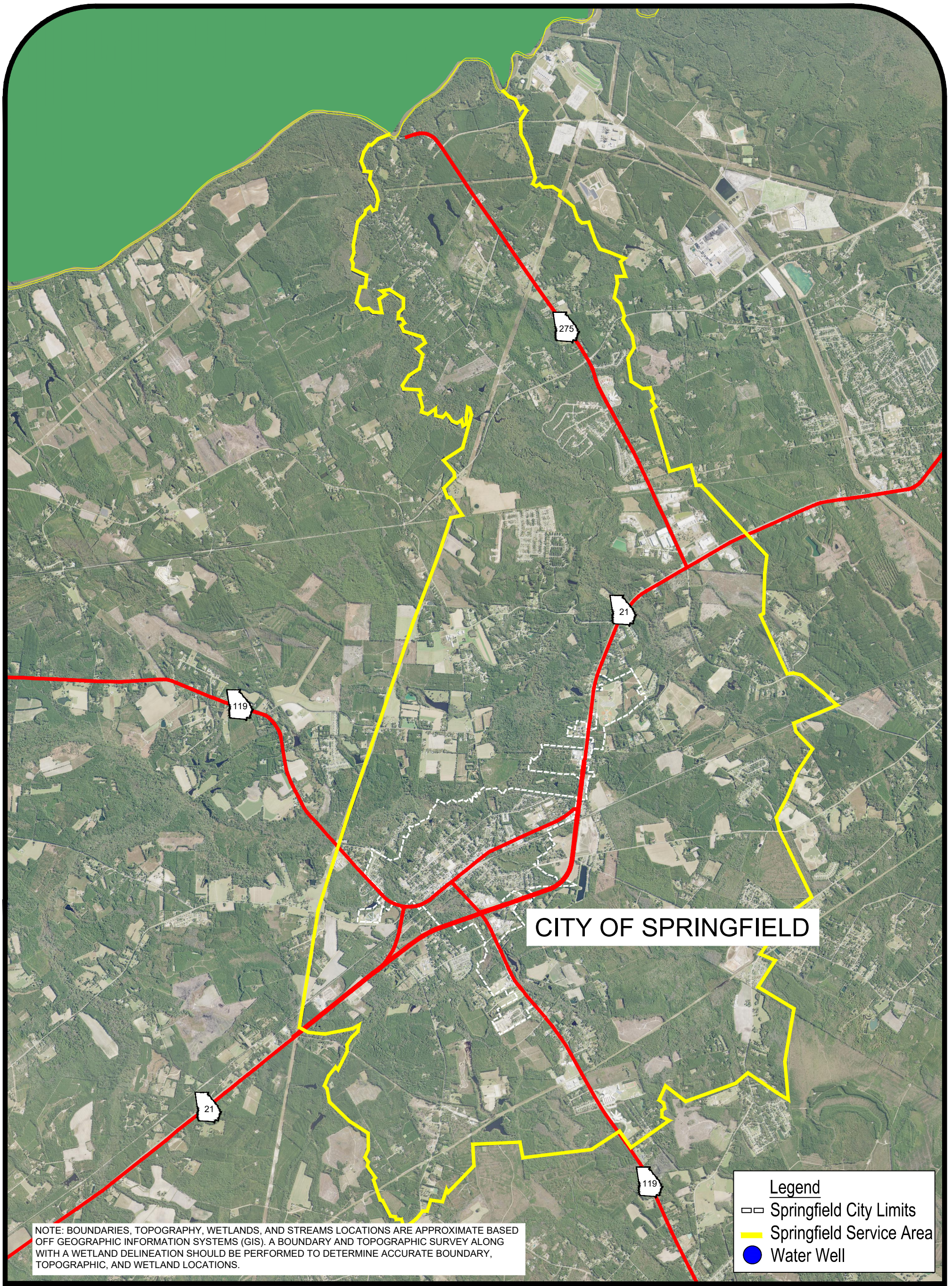

EXHIBIT D

0 750 1,500 3,000

(IN FEET)

Springfield Water Service Area Map
Water and Wastewater Master Plan
Effingham County, Georgia

Project No.: 21162-2051
September 30, 2021

Prepared by
Alliance Consulting Engineers, Inc.

3.2.4 Planned Future Water Improvements

The City of Springfield's 2021 Budget includes Water Expenditures and Special Purpose Local Option Sales Tax (SPLOST) Expenditures Capital Improvements Plan (CIP). The City of Springfield has funding for the Water System improvements outlined in **Table 9** below. The City of Springfield has no additional plans for expansion of the water service area and no planned improvements to increase their capacity that are currently under consideration.

Table 9: City of Springfield Planned Future Water Improvements

Project Description	Estimated Expenditure
SPLOST Water/Sewer Expenditures	$65,634
Distribution System Repair & Maintenance	$95,000
Distribution System Infrastructure Repairs	$50,000
Well Renovations	$35,000
Elevated Water Storage Tank Repair and Maintenance	$50,223

3.2.5 Rate and Fee Schedule

The City of Springfield has developed a Rate and Fee Schedule based on usage and customer designation. A complete Rate and Fee Schedule can be found in **Appendix C,** and a summarized version can be found in **Table 10**.

Table 10: City of Springfield Water Rate Schedule

Customer Type	Base Rate	2,000 Gal – 5,000 Gal	5,000 Gal – 20,000 Gal	Over 20,000 Gal
Residential-Inside City	$12.13	$2.43 per 1,000-gal	$3.03 per 1,000-gal	$3.34 per 1,000-gal
Residential-Outside City	$18.20	$3.03 per 1,000-gal	$4.24 per 1,000-gal	$5.46 per 1,000-gal
Commercial-Inside City	$12.13	$2.43 per 1,000-gal	$3.03 per 1,000-gal	$3.34 per 1,000-gal
Commercial-Outside City	$18.20	$3.03 per 1,000-gal	$4.24 per 1,000-gal	$5.46 per 1,000-gal

The United States Census estimates 2.84 persons per household (2015 – 2019) for Effingham County. The United States Geological Service (USGS) reports that the domestic per capita use for public-supplied water in City of Springfield was 100 gallons per person per day; therefore, the average monthly usage per City of Springfield residential

water customer would be expected to be approximately 8,520 gallons per month. Based on this, a residence located within City of Springfield would be charged a monthly bill of $32.52 and a residence located outside of city limits would be charged a monthly bill of $39.19.

3.2.6 Financial Position

The City of Springfield has an Audited Financial Statement completed at the end of each fiscal year to assess its financial position created over the previous twelve (12) months of operation. The City of Springfield has the Audited Financial Statement organized such that the Water and Wastewater Operations are assessed jointly. A summarized version of the 2020 Audited Financial Statement pertaining to the public water and wastewater system can be found in **Table 11,** and the complete 2020 Audited Financial Statement can be found in **Appendix C**.

Table 11: City of Springfield 2020 Financial Statement	
Operating Revenues	$2,263,560
Operating Expenses	$1,641,816
Operating Income	$621,744
Non-Operating Expense	($197,535)
Income Before Transfers and Capital Contributions	$424,209
Capital Contributions	$102,500
Transfers-In	-
Change in Net Position	$526,709
Net Position, Beginning of the Year	$8,486,652
Net Position, End of the Year	$9,013,361

Based on the 2020 Financial Statement, the City of Springfield reported a Net Gain through both Operating Revenues and Capital Contributions.

3.3 City of Rincon

3.3.1 Service Area and Customer Base

The City of Rincon provides water service to customers within the city limits and outside city limits, as shown on the City of Rincon Water Service Area Map (Exhibit D). **Table 12** below summarizes the Georgia EPD's Active Permitted Drinking Water Systems List updated November 2020 for the City of Rincon.

Table 12: City of Rincon Active Water System Permits

Name	WSID	Type	Population Served
City of Rincon	GA1030000	Groundwater	2,394

Source: Georgia EPD Drinking Water / Public Water System Permit List dated November 2020

3.3.2 Water Supply and Treatment

Potable Water is supplied to the City of Rincon from two (2) groundwater wells that source water from the Floridian Aquifer. The City of Rincon's Groundwater Withdrawal Permits (051-0015 and 051-0001) indicate the Permit Limit Yearly Average is 0.863 Million Gallons per Day (MGD) and 0.882 MGD, respectively. The Permit Limit Monthly Average is 1.25 MGD and 1.401 MGD, respectively

Potable Water withdrawn from the groundwater wells mentioned above is treated at their source prior to distribution. Groundwater withdrawn from the Floridian Aquifer at the groundwater wells is disinfected with chloramines at the well head prior to distribution. The locations of the Groundwater Wells are depicted in **Exhibit E**.

3.3.3 Water Storage

The City of Rincon currently has two (2) elevated water storage tanks that provide the pressure needed to supply water throughout the system. Additional information about these tanks is presented in Table 13. The location of the tanks is depicted in Exhibit E of this report.

Table 13: City of Rincon Water Storage

Tank	Tank Type	Estimated Overflow (FT – MSL)	Volume (Gallons)
Lisa Street (Tank 1)	Elevated	Not Available	Not Available
Unknown (Tank 2)	Elevated	Not Available	Not Available

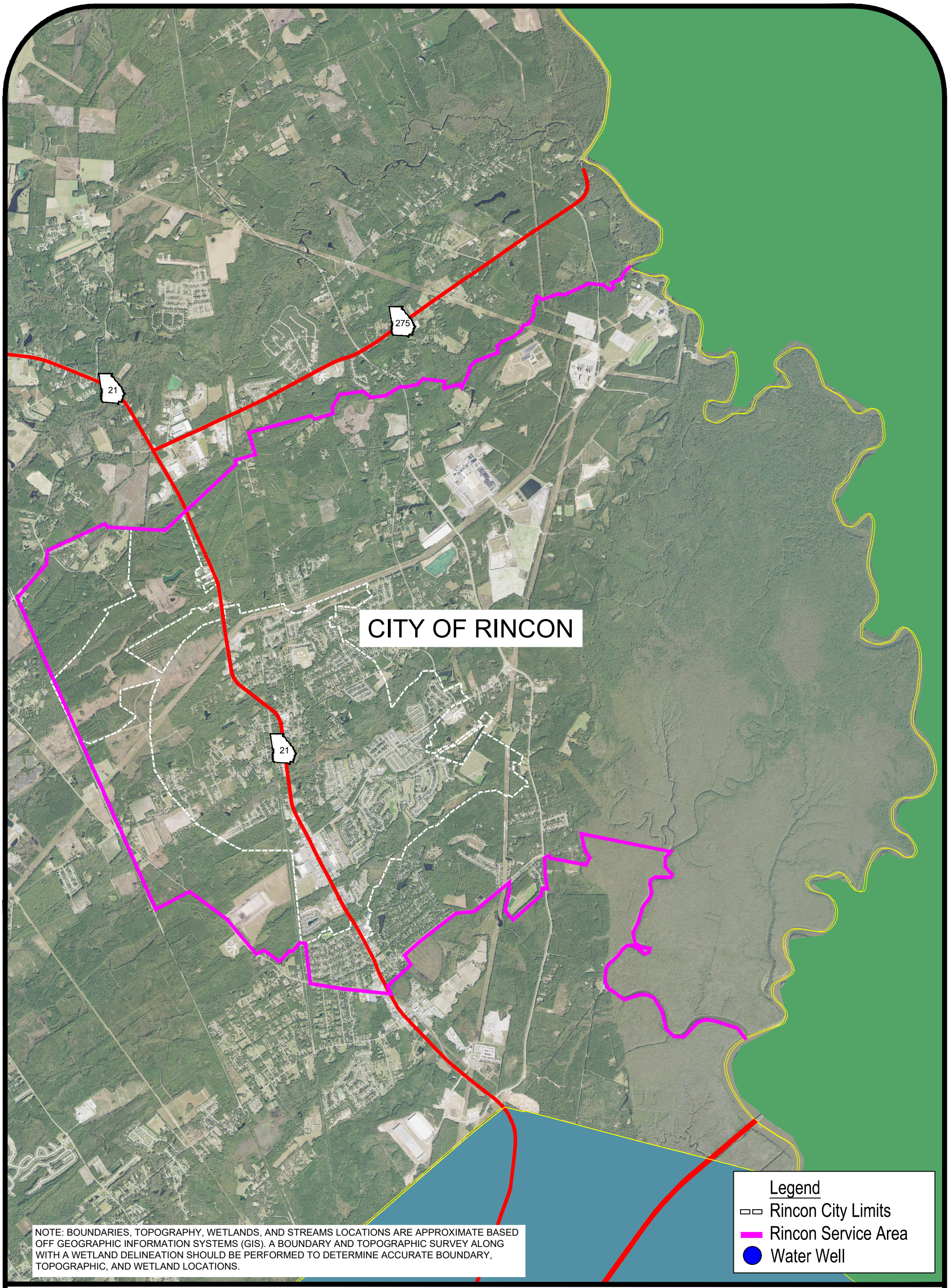

EXHIBIT E

0 750 1,500 3,000

(IN FEET)

Rincon Water Service Area Map
Water and Wastewater Master Plan
Effingham County, Georgia

Project No.: 21162-2051
August 27, 2021

Prepared by
Alliance Consulting Engineers, Inc.

3.3.4 Planned Future Water Improvements

The City of Rincon's 2021 Budget includes a Capital Improvements Plan (CIP). The City of Rincon Public Works has funding for the Water System improvements, outlined in Table 14, over the next five (5) years. The City of Rincon has no additional plans for expansion of the water service area and no planned improvements to increase their capacity that are currently under consideration.

Table 14: City of Rincon Planned Future Water Improvements

Fiscal Year	Estimated Expenditure	Project Description
2021	$1,194,485	Phase III West 7th Street Water and Wastewater Upgrades
	$60,000	Well 3 Piping Replacement
2022	$330,000	Replace Two (2)-Inch Waterline along Richland Avenue with an Eight (8)-Inch Water Main and Fire Hydrants
	$40,000	Replace Pump at Well 4
2023	$4,500,000	Extend Sixteen (16)-Inch Waterline from Well 5 to Ft. Howard and connect to Lexington Avenue and East 4th Street
	$300,000	Lisa Street Tank Maintenance
2024	$2,500,000	Extend Twelve (12)-Inch Water Main from Chimney Road to Ft. Howard
2025	$60,000	Replace Pump at Well 3
	$200,000	Replace remaining Two (2)-Inch Waterlines throughout City

3.3.5 Rate and Fee Schedule

The City of Rincon has developed a rate and fee schedule based on usage, customer designation, and customer location. A complete rate and fee schedule can be found in **Appendix D,** and a summarized version can be found in Table 15.

Table 15: City of Rincon Water Rate Schedule

Customer Type	Base Rate	3,001 Gal – 9,000 Gal	9,001 Gal – 15,000 Gal	15,001 Gal – 45,000 Gal	Over 45,001 Gal
Residential-Inside City	$16.00	$4.00 per 1,000-gal	$5.50 per 1,000-gal	$6.25 per 1,000-gal	$6.75 per 1,000-gal
Residential-Outside City	$22.00	$5.50 per 1,000-gal	$6.25 per 1,000-gal	$6.75 per 1,000-gal	$7.50 per 1,000-gal
Commercial-Inside City	$29.00	$4.00 per 1,000-gal	$5.50 per 1,000-gal	$6.25 per 1,000-gal	$6.75 per 1,000-gal
Commercial-Outside City	$41.00	$5.50 per 1,000-gal	$6.25 per 1,000-gal	$6.75 per 1,000-gal	$7.50 per 1,000-gal

The United States Census estimates 2.84 persons per household (2015 – 2019) for Effingham County. The United States Geological Service (USGS) reports that the domestic per capita use, for public-supplied water in City of Rincon was 100 gallons per person per day; therefore, the average monthly usage per City of Rincon residential water customer would be expected to be approximately 8,520 gallons per month. Based on this, a residence located within City of Rincon would be charged a monthly bill of $42.08 and a residence located outside of city limits would be charged a monthly bill of $57.86.

3.3.6 Financial Position

The City of Rincon has an Audited Financial Statement completed at the end of each fiscal year to assess its financial position created over the previous twelve (12) months of operation. The City of Rincon has the Audited Financial Statement organized such that the Water and Wastewater Operations are assessed jointly. A summarized version of the 2020 Audited Financial Statement pertaining to the public water and wastewater system can be found in Table 16, and the complete 2020 Audited Financial Statement can be found in **Appendix D**.

Table 16: City of Rincon 2020 Financial Statement	
Operating Revenues	**3,613,658**
Operating Expenses	**3,153,329**
Non-Operating Revenues	1,878,718
Operating Income	460,329
Income before Interfund Transfer	2,339,047
Interfund Transfers	420,384
Change in Net Position	2,759,431
Net Position, Beginning of the Year	25,241,870
Net Position, End of the Year	28,001,301

Based on the 2020 Financial Statement, the City of Rincon reported a Net Gain in the Water and Wastewater Operations.

3.4 City of Guyton

3.4.1 Service Area and Customer Base

The City of Guyton provides water service within city limits and outside of city limits. Table 17 below summarizes the Georgia EPD's Active Permitted Drinking Water Systems List updated November 2020 for the City of Guyton.

Table 17: City of Guyton Active Water System Permits

Name	WSID	Type	Population Served
Guyton	GA1030000	Groundwater	2,394

Source: Georgia EPD Drinking Water / Public Water System Permit List dated November 2020

3.4.2 Water Supply and Treatment

Potable Water is supplied to the City of Guyton from three (3) groundwater wells that sources water from the Floridian Aquifer. The City of Guyton's Groundwater Withdrawal Permit (051-0005) indicates the Permit Limit Yearly Average is 0.715 Million Gallons per Day (MGD) and that the Permit Limit Monthly Average is 0.765 MGD.

Potable Water withdrawn from the groundwater well mentioned above is treated at their source prior to distribution. Groundwater withdrawn from the Floridian Aquifer at the groundwater well is disinfected with chlorine at the well head prior to distribution. The locations of the Groundwater Wells are depicted in Exhibit F.

3.4.3 Water Storage

The City of Guyton currently has three (3) water storage tanks, one (1) of which has been permanently removed from service, that provides the pressure needed to supply water throughout the system. Additional information about these tanks is presented in **Table 18**. The location of the tanks is depicted in **Exhibit F** of this report.

Table 18: City of Guyton Water Storage

Name	Type	Estimated Overflow (FT – MSL)	Volume (Gallons)
Well # 1 Central Avenue	Elevated Tank	Removed from Service Permanently	
Well #2 Pine Street	Hydropneumatic Tank	Not Available	5,000
Well #3 Magnolia Street	Elevated Tank	Not Available	150,000

EXHIBIT F

0 750 1,500 3,000

(IN FEET)

Guyton Water Service Area Map
Water and Wastewater Master Plan
Effingham County, Georgia

Project No.: 21162-2051
August 27, 2021

EFFINGHAM COUNTY EST. 1777 GEORGIA

ALLIANCE CONSULTING ENGINEERS

Prepared by
Alliance Consulting Engineers, Inc.

3.4.4 Planned Future Water Improvements

The City of Guyton's 2021 Budget includes a Capital Improvements Plan (CIP). The City of Guyton has funding for the Water System improvements outlined in Table 19 below. The City of Guyton has no additional plans for expansion of the water service area and no planned improvements to increase their capacity that are currently under consideration.

Table 19: City of Guyton Planned Future Water Improvements

Project Description	Estimated Expenditure
SCADA Well Upgrades to Three (3) Wells	$27,000
Raise Wellhead, Wells 1 & 2	$74,230
Tank Inspection and Repair	$35,000
Water Repairs and Meters	$42,500

3.4.5 Rate and Fee Schedule

The City of Guyton has developed a rate and fee schedule based on usage, customer designation, and customer location. A complete rate and fee schedule can be found in **Appendix E,** and a summarized version can be found in Table 20.

Table 20: City of Guyton Water Rate Schedule

Customer Type	Base Rate	2,001 Gal – 5,000 Gal	5,001 Gal – 10,000 Gal	10,001 Gal – 20,000 Gal	20,00 Gal – 30,000 Gal	30,000 Gal – 50,000 Gal	Over 40,000 Gal	Over 50,000 Gal
Residential	$21.62 (First 2,000 Gal)	$3.83 per 1,000-gal	$4.32 per 1,000-gal	$4.32 per 1,000-gal	$6.08 per 1,000-gal	$11.45 per 1,000-gal	-	$17.19 per 1,000-gal
Commercial	$38.82 (First 5,000 Gal)	-	$3.83 per 1,000-gal	$3.83 per 1,000-gal	$4.32 per 1,000-gal	$4.32 per 1,000-gal	-	$4.32 per 1,000-gal
Industrial	$61.75 (First 10,000 Gal)	-	-	$3.83 per 1,000-gal	$4.32 per 1,000-gal	$4.32 per 1,000-gal	-	$4.32 per 1,000-gal
Schools	$452.66 (First 40,000 Gal)	-	-	-	-	-	$4.94 per 1,000-gal	-

The United States Census estimates 2.84 persons per household (2015 – 2019) for Effingham County. The United States Geological Service (USGS) reports that the domestic per capita use, for public-supplied water in City of Guyton was 100 gallons per person per day; therefore, the average monthly usage per City of Guyton residential water customer would be expected to be approximately 8,520 gallons per month. Based on this, a residence located within City of Guyton would be charged a monthly bill of $48.32.

3.4.6 Financial Position

The City of Guyton has an Audited Financial Statement completed at the end of each fiscal year to assess its financial position created over the previous twelve (12) months of operation. The City of Guyton has the Audited Financial Statement organized such that the Water and Wastewater Operations are assessed jointly. A summarized version of the 2020 Audited Financial Statement pertaining to the public water and wastewater system can be found in Table 21, and the complete 2020 Audited Financial Statement can be found in **Appendix E**.

Table 21: City of Guyton 2020 Financial Statement	
Operating Revenues	$1,588,822
Operating Expenses	$910,739
Non-Operating Expenses	($314,902)
Operating Income	$678,083
Income before Transfer	$363,181
Interfund Transfers	$1,365
Change in Net Position	$364,546
Net Position, Beginning of the Year	$4,557,025
Net Position, End of the Year	$4,921,571

Based on the 2020 Financial Statement, the City of Guyton reported a Net Gain in the Water and Wastewater Operations.

3.5 Water Utility Management

3.5.1 Service Area and Customer Base

Several private water utility companies provide water service throughout Effingham County. Water Utility Management provides service to approximately 4,274 customers throughout Effingham County, largely in the southern portion of the County. **Table 22** below summarizes the Georgia EPD's Active Permitted Drinking Water Systems List updated December 2021 for Water Utility Management.

Table 22: Water Utility Management Active Water System Permits

Name	WSID	Type	Active Connections
Foxbow Farms	1030016	Groundwater	300
Conifer Crossing	1030095	Groundwater	361
Foxbow North	1030017	Groundwater	207
Auriga Farms	1030082	Groundwater	230
Kensington-Saddlebrook-Whitehall	1030093	Groundwater	156
Lakewood-Rabun Estates	1030108	Groundwater	149
Huntington-Meadowood-Saint Matthew's	1030119	Groundwater	140
Royal Oaks Plantation	1030112	Groundwater	96
Castlewood-Clearview-Warner Fields	1030117	Groundwater	148
Stonegate	1030144	Groundwater	134
River Road Farms	1030102	Groundwater	97
Buckfield-Pleasant Hill	1030129	Groundwater	85
Waterford Plantation	1030103	Groundwater	71
Meldrim Lake Acres	1030011	Groundwater	81
Paddleford	1030079	Groundwater	75
Shadowbrook	1030143	Groundwater	90
Pecan Grove	1030018	Groundwater	68
Hampton Creek-High Point	1030116	Groundwater	57
Creekwood Farms	1030090	Groundwater	28
Coventry Plantation	1030106	Groundwater	48
Hawk Hammock	1030088	Groundwater	33
Coachwood Estates	1030092	Groundwater	29
Lowground Farms	1030128	Groundwater	39
Hunters Mill	1030109	Groundwater	44
Old Dixie Estates	1030158	Groundwater	33
Mallard Point	1030138	Groundwater	32
Pineora	1030028	Groundwater	35
Barrington	1030120	Groundwater	30
Eagle's Landing	1030147	Groundwater	26
Meldrim Apartments	1030155	Groundwater	28
Pennington Estates	1030157	Groundwater	18
Rosewood	1030105	Groundwater	20
Hidden Lake	1030127	Groundwater	17
Stillwood-Log Landing	1030133	Groundwater	20
Jamestown	1030134	Groundwater	72
Rahn Station	1030130	Groundwater	19

3.5.2 Water Supply and Treatment

Potable Water is supplied to Water Utility Management from eleven (11) groundwater wells that sources water from the Floridan Aquifer. Water Utility Management's Groundwater Withdrawal Permits consist of Azalea Point (051-0016) which has four (4) permitted sources with an annual average limit of 0.203 MGD and a pumping average of 90,000 GPD. Lakeside Farms-Bloomingdale (051-0014) has four (4) permitted sources with an annual average limit of 0.079 MGD and a pumping average of 72,000 GPD. Goshen Hills-Goshen Villa (051-0017) has three (3) permitted sources with an annual average limit of 0.108 MGD and a pumping average of 40,000 GPD. Based on this, Water Utility Management has an overall annual average limit of 0.390 MGD and a pumping average of 202,000 GPD.

Potable Water withdrawn from the groundwater wells mentioned above is treated at their source prior to distribution. Groundwater withdrawn from the Floridan Aquifer at the groundwater well is disinfected with chlorine and treated with fluoride at the well head prior to distribution.

3.5.3 Water Storage

Water Utility Management currently has several water storage tanks that provide the pressure needed to supply water throughout the system. Additional information about these tanks is presented in **Table 23**.

Table 23: Water Utility Management Water Storage

Name	Volume (Gallons)
Hawk Hammock Well 2	300
Eden Lakes	500
Meadowood	500
Meldrim Apartments Well 1	500
Meldrim Apartments Well 2	500
Twin Lakes	750
Rosewood	900
Coachwood Estates	1,000
Megan's Bay	1,000
Midland Estates	1,000
Pineora Well #2	1,000
Hawk Hammock Well 1	1,500
Jamestown Well 2	1,500
Lakeside Farms Well #4	1,500
Pennington Estates	1,500
Rahns Station	1,500

Table 23: Water Utility Management Water Storage (cont.'d)	
Name	**Volume (Gallons)**
Stillwood	1,500
Creekwood Farms	2,000
Foxbow Farms	2,000
Lowground Farms Well #1	2,000
Old Dixie Estates Well #1	2,800
Hidden Lake	3,000
Foxbow North Well 2	3,500
Lakeside Farms Well #1	3,500
Lakeside Farms Well #2	3,500
Auriga Farms Well 1	5,000
Auriga Farms Well 2	5,000
Barrington	5,000
Barrister	5,000
Buckfield Well #1	5,000
Castlewood Well 1	5,000
Conifer	5,000
Coventry	5,000
Eagles Landing Well #1	5,000
Foxbow Farms	5,000
Foxbow North Well 1	5,000
Goshen - Jennifer	5,000
Goshen Huger	5,000
Hampton Creek	5,000
Hunters Mill	5,000
Jamestown Well 1	5,000
Kensington	5,000
Lakeside Farms (Thompson)	5,000
Lakewood	5,000
Mallard Point Well 1	5,000
Meldrim	5,000
Paddleford	5,000
Parkway Place Well #1	5,000
Pecan Grove	5,000
Pineora Well #1	5,000
Rabun Estates	5,000
Saddlebrook	5,000
Shadow Brook Well #1	5,000
Stonegate Well #1	5,000
Warner Fields	5,000
Waterford Plantation	5,000
Forest Hills	10,000
Foxbow Farms	10,000
River Road Farms Well 1	10,000
River Road Farms Well 2	10,000

3.5.4 Planned Future Water Improvements

Water Utility Management has plans for the Water System improvements outlined in **Table 24**. Water Utility Management has no additional plans for expansion of the water service area and no planned improvements to increase their capacity that are currently under consideration.

Table 24: Water Utility Management Planned Future Water Improvements

Project Description	Year
Replace 3,000-Gallon Tank at Creekwood Farms	2021
Replace Well House & 5,000-Gallon Tank at Pineora	2022
Expand Water Service to Barrister Landing 81 Lots/ New Construction Pump and Motor	2022
Install 60KW Generator at Forest Hills for Emergency Service	2022
Replace Well House Roof at Forest Hills	2022
Interconnect Water Systems at Stonegate and Foxbow	2023
Interconnect Water Systems at Barrington and Paddleford	2023
Replace Pump House at Goshen Road-Barrington	2023
Replace Well House at Barrington	2023
Sand blast and epoxy coat 5,000-Gallon tank at Hampton Creek	2024

3.5.5 Rate and Fee Schedule

Water Utility Management has developed a bi-monthly rate and fee schedule based on usage. A complete rate and fee schedule can be found in **Appendix E,** and a summarized version can be found in **Table 25**.

Table 25: Water Utility Management Water Rate Schedule

Base Rate	12,001 Gal – 24,000 Gal	24,001 Gal – 36,000 Gal	36,001 Gal – 60,000 Gal	Over 60,000 Gal
$90.00	$3.00 per 1,000 gal	$4.00 per 1,000 gal	$5.00 per 1,000 gal	$6.00 per 1,000 gal

The United States Census estimates 2.84 persons per household (2015 – 2019) for Effingham County. The United States Geological Service (USGS) reports that the domestic per capita use, for public-supplied water in Effingham County was 100 gallons per person per day; therefore, the average monthly usage per residential water customer would be expected to be approximately 8,520 gallons per month and approximately 17,040 gallons every two (2) months. Based on this, a residence located within Water Utility Management's territory would be charged a bi-monthly bill of $105.12.

4 EXISTING WASTEWATER SYSTEM INFORMATION

The existing public wastewater systems within Effingham County consist of four (4) operating systems: Effingham County, City of Springfield, City of Rincon, and the City of Guyton. These Public Wastewater Systems serve approximately 26,441 persons across Effingham County. The EPD Active Wastewater Permits List indicates that four (4) private wastewater systems also provide wastewater service to residents throughout Effingham County, which include Coastal Water & Sewage Company, Cypress Lakes Phase III Water Pollution Control Plant (WPCP), Rabun Estate WPCP, and Stonegate Subdivision WPCP. The Georgia EPD estimated that there are approximately 15,025 septic systems located throughout Effingham County that serve the remaining population in Effingham County. This report will discuss the existing wastewater system information for the public wastewater systems in Effingham County.

4.1 Effingham County

4.1.1 Service Area and Customer Base

Effingham County provides wastewater service to the unincorporated areas of Effingham County. The majority of wastewater service is supplied to the unincorporated area of Effingham County south of the incorporated areas, as illustrated in the Effingham County Wastewater Service Area Map in **Exhibit G**. **Table 26** below summarizes the Georgia EPD's Active Wastewater Permits List updated August 2021 for Effingham County.

Table 26: Effingham County Active Wastewater System Permits

Name	Permit No.	Type	Permitted Discharge (MGD)
Effingham County Industrial Park Water Reclamation Facility (WRF)	GAJ020032	Land Application System	0.09
Effingham County South WRF	GAJ020016	Land Application System	0.5

Source: Georgia EPD Wastewater Permits dated August 2, 2021

4.1.2 Existing Wastewater Collection System

Effingham County operates and maintains approximately thirty-eight (38) miles of gravity wastewater lines and forty (40) miles of force main ranging in size from four (4) inches to thirty-six (36) inches. The wastewater collection system currently has thirty (30) pump stations, which are detailed in **Table 27** below. Effingham County provides wastewater service to residents in the southern portion of unincorporated Effingham County. This service area is depicted in **Exhibit G**.

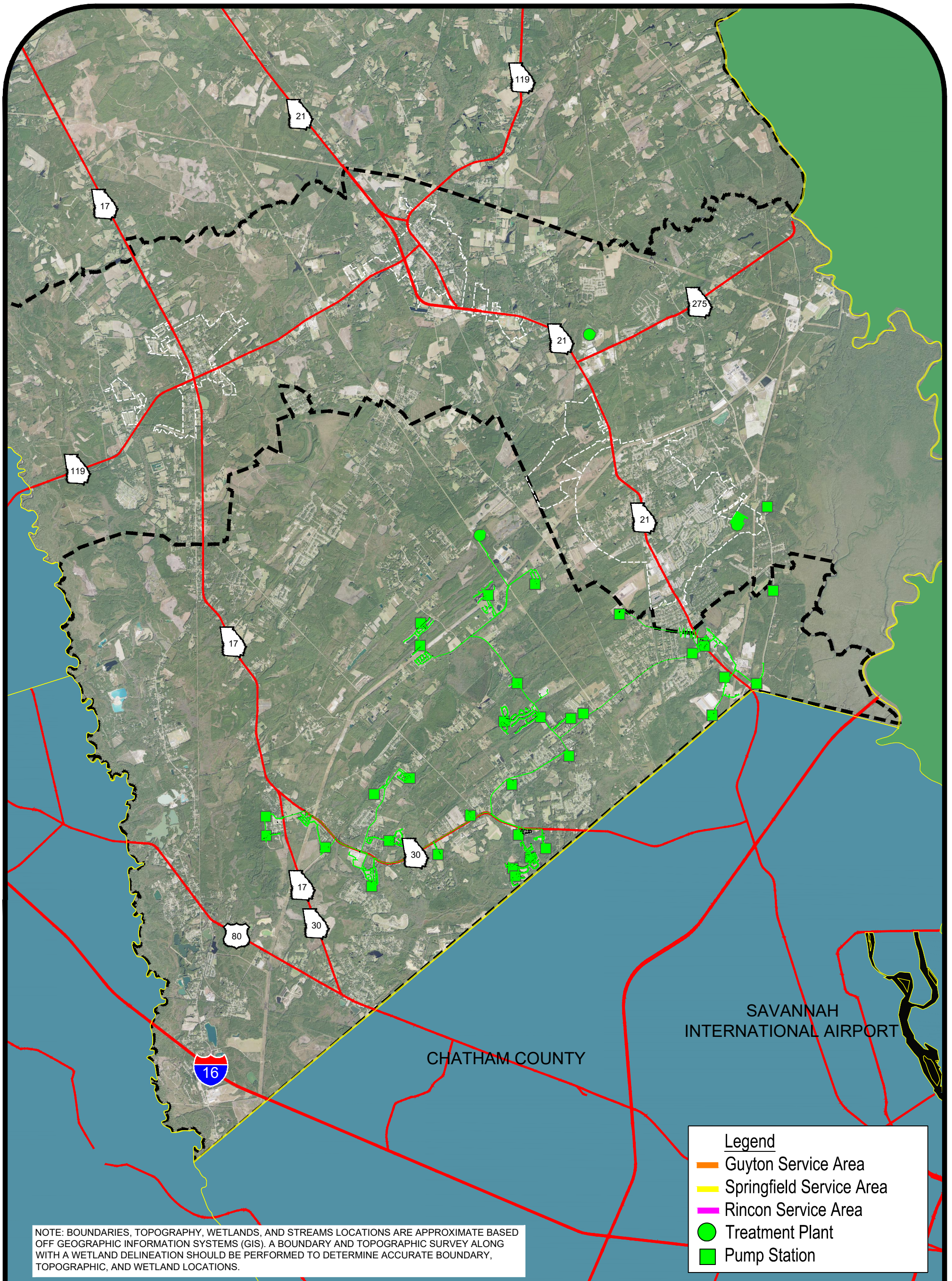

EXHIBIT G

0 1,000 2,000 4,000

(IN FEET)

Effingham County
Wastewater Service Area Map
Water and Wastewater Master Plan
Effingham County, Georgia

Project No.: 21162-2051
September 30, 2021

Prepared by
Alliance Consulting Engineers, Inc.

Table 27: Effingham County Wastewater Pump Stations		
Pump Station ID	**Description**	**Design Flow GPM**
EF-PS-01	MARLOW ELEMENTARY	227
EF-PS-02	SOUTH BEND	600
EF-PS-03	SOUTH EFFINGHAM ELEMENTARY	74
EF-PS-04	HODGEVILLE ROAD	1650
EF-PS-05	PARK WEST	850
EF-PS-06	EXLEY TRACT	1150
EF-PS-07	GREYSTONE	1000
EF-PS-08	BLANDFORD ELEMENTARY	180
EF-PS-09	GOSHEN ROAD_LEARNING TREE	172
EF-PS-10	WINDFIELD	397
EF-PS-11	S.E.P_BUCKINGHAM	320
EF-PS-12	OLD AUGUSTA RD-JASPER VILLAGE	425
EF-PS-13	TIMBERLAKE	165
EF-PS-14	STAFFORDSHIRE	250
EF-PS-15	SETTLERS POINT	20
EF-PS-16	PARK WEST PHASE 3	348
EF-PS-17	RED OAK	40
EF-PS-18	SUMMER STATION	90
EF-PS-19	CEDAR RIDGE	50
EF-PS-20	LAUREL MILL	90
EF-PS-21	BLANDFORD CROSSING	95
EF-PS-22	SADDLECLUB @ BELMONT GLEN	250
EF-PS-23	PATRIOTS POINT	136
EF-PS-24	ANTIGUA- CARRIBEAN VILLAGE	
EF-PS-25	PARK WEST PHASE 4	90
EF-PS-26	WOODLANDS	50
EF-PS-27	COVERED BRIDGE	116
EF-PS-28	TRADE CENTER- GITC	255
EF-PS-29	BLUE JAY COMMONS	96
EF-PS-30	PARK WEST PHASE 5	144

4.1.3 Existing Wastewater Reclamation Facilities

Effingham County owns and operates two (2) Water Reclamation Facilities (WRF): The South Water Reclamation Facility and the Effingham County Industrial Park Water Reclamation Facility. The locations of the Water Reclamation Facilities are depicted in Exhibit G.

South Water Reclamation Facility – GAJ020016

The South Water Reclamation Facility, located at 805 Low Ground Road, Guyton, Georgia, is permitted as a Land Application System through the Georgia EPD. The permit and authorization to discharge expires April 30, 2026. The WRF processes wastewater through a series of influent screening, grit removal, biological treatment (oxidation ditch), clarification, filtration, disinfection (UV and sodium hypochlorite), reject pond, and reuse tank. Treated effluent is either distributed to reuse customers or land applied on spray field. Reuse water can be stored in the approximately 250,000-gallon tank prior to distribution to reuse customers. Reject water, which does not meet EPD reuse standards, is returned to the head of the plant for treatment. The reject pond has a volume of approximately 3,200,000 gallons. Solids are digested, dewatered, and transported to a permitted landfill.

Currently the permitted design flow is approximately 0.5 MGD. Phase II of the WRF plans to increase flow to 0.75 MGD while Phase III plans increase flow to 1 MGD. The WRF has been designed for 1 MGD; however, the spray field has a limited capacity of 0.272 MGD. Based on this, the weekly average flow to the spray field is 0.272 MGD and additional flow of treated wastewater is provided to reuse customers. The land treatment system consists of approximately twenty-eight (28) acres of planted pine divided into three (3) zones. Approximately 2.5 inches are applied per week to the land treatment system. A copy of the Land Application System Permit can be found in **Appendix F**.

Industrial Park Water Reclamation Facility – GAJ020032

The Industrial Park Water Reclamation Facility, located at Bay Road, Meldrim, Georgia, is permitted as a Land Application System through the Georgia EPD. The facility has not been constructed. The proposed WRF processes wastewater through a series of influent screening, grit removal, biological treatment (oxidation ditch), clarification, filtration, disinfection (UV and sodium hypochlorite), reject pond, and reuse tank. Treated

effluent is either distributed to reuse customers or land applied on spray field. Reject water, which does not meet EPD reuse standards, is returned to the head of the plant for treatment. The reject pond has a volume of approximately 750,000 gallons. Solids are digested, dewatered, and transported to a permitted landfill.

Currently the permitted design flow is approximately 0.34 MGD. Up to approximately 0.25 MGD of treated wastewater will be distributed to reuse customers and up to 0.09 MGD will be land applied. The land treatment system consists of approximately fifteen (15.3) acres of coastal bermuda grass divided into two (2) zones. Approximately 1.74 inches are applied per week to the land treatment system. A copy of the Land Application System Permit can be found in **Appendix F**.

4.1.4 Wastewater Characteristics

Effingham County's wastewater is largely comprised of residential and commercial discharges. The Effingham County South WRF does not currently accept process wastewater from industrial customers. The South WRF accepts an average of 77,500 GPD of wastewater from septic tanks. Wastewater effluent from these waste streams are typical characteristics of domestic influent: BOD_5 – 250 mg/l, TSS – 250 mg/l, and Ammonia – 50 mg/l.

Effluent Monitoring Results were obtained from the 2019 LAS Permit Application, for the period of May 2018 through April 2019, and they have been summarized to characterize flow. The treated wastewater is monitored on a monthly basis. Over this period, the average monthly wastewater flows at the WRF were approximately 347,000 gallons per day. **Table 28** below provides a summarized version of the effluent monitoring results which can be found in **Appendix F**.

Table 28: South WRF Effluent Wastewater Characteristics

Parameter	Treatment Standard	Monthly Average
Flow (MGD)	0.5	0.347
BOD_5	5.0 mg/L	2
TSS	5.0 mg/L	1.83
Fecal Coliform Bacteria	23#/100 mL 100#/100 mL (daily Max)	
pH (Daily Min / Max)	6.0 – 9.0 S.SU.	
Turbidity (Daily Max)	3 NTU	

4.1.5 Planned Future Wastewater Improvements

Effingham County's 2022 Budget includes a Capital Improvements Plan (CIP). Effingham County has funding for Wastewater System improvements outlined in **Table 29** below.

Table 29: Effingham County Planned Wastewater Improvements	
Estimated Expenditure	**Project Description**
$25,000	RAS Pump and Motor Replacement
$50,000	Headworks Upgrades
$50,000	Belt Press Upgrades
$3,000,000	Direct Discharge Application to increase capacity at Plant
$140,000	New Wastewater Force Main from Hodgeville Lift Station to the WWTP - Engineering
$2,777,700	New Wastewater Force Main from Hodgeville Lift Station to the WWTP - Construction
$450,000	Sprayfield Construction to increase capacity at plant
$30,000	Sprayfield Engineering to increase capacity at plant
$2,340,000	Hodgeville Lift Station Upgrade
$500,000	Wastewater connection adjacent to Hodgeville Road
$200,000	WWTP Repairs and Upgrades

4.1.6 Rate and Fee Schedule

Effingham County has developed a rate and fee schedule based on usage and customer designation. A complete rate and fee schedule can be found in **Appendix F,** and a summarized version can be found in **Table 30.**

Table 30: Effingham County Wastewater Rate Schedule				
Customer Type	**Base Rate**	**1,000 Gal – 5,000 Gal**	**5,000 Gal – 10,000 Gal**	**Over 10,000 Gal**
Residential	$15.00	$2.62 per 1,000-gal	$2.90 per 1,000 gal	$3.18 per 1,000-gal
Commercial/ Industrial	$60.00	$4.00 per 1,000-gal	$5.00 per 1,000-gal	$6.00 per 1,000 gal

The United States Census estimates 2.84 persons per household (2015 – 2019) for Effingham County. The Georgia Department of Public Health Design Flows indicate wastewater systems should be designed to accommodate a flow of 75 gallons per person per day. Therefore, the average monthly usage per Effingham County residential wastewater customer would be expected to be approximately 6,603 gallons per month. Based on this, a residence located within Effingham County would be charged a monthly bill of $30.41.

4.1.7 Financial Position

Effingham County has an Audited Financial Statement completed at the end of each fiscal year to assess its financial position created over the previous twelve (12) months of operation. Effingham County has the Audited Financial Statement organized such that the Water and Wastewater Operations are assessed jointly; however, the Wastewater Treatment Plant is assessed on its own. A summarized version of the 2020 Audited Financial Statement pertaining to the public water and wastewater system can be found in Table 6 in Section 3.1.6. **Table 31** summarizes the Audited Financial Statement pertaining to the Wastewater Treatment Plant. The complete 2020 Audited Financial Statement can be found in **Appendix F**.

Table 31: Effingham County 2020 Financial Statement – Wastewater Treatment Plant	
Operating Revenues	$159,764
Operating Expenses	$1,114,896
Operating Loss	($955,132)
Non-Operating Expenses	($289,078)
Loss before Capital Contributions and Transfers	($1,244,210)
Capital Contributions and Cost Recovery Fees	$1,448,391
Transfers-In	$939,282
Change in Net Position	$1,143,463
Net Position, Beginning of the Year	($163,554)
Net Position, End of the Year	$979,909

Based on the 2020 Financial Statement, Effingham County reported a Net Loss, due to the large discrepancy in Operating Revenues and Operating Expenses and Non-Operating Expenses.

4.2 City of Springfield

4.2.1 Service Area and Customer Base

The City of Springfield provides wastewater service to customers within the city limits and outside city limits, as shown on the City of Springfield Wastewater Service Territory Map (**Exhibit H**). **Table 32** below summarizes the Georgia EPD's Active Wastewater System Permits List updated August 2021 for the City of Springfield.

Table 32: City of Springfield Active Wastewater System Permits

Name	Permit No.	Type	Permitted Discharge (MGD)
Springfield Water Reclamation Facility	GA0020770	NPDES	0.6

Source: Georgia EPD Wastewater Permits dated August 2, 2021

4.2.2 Existing Wastewater Collection System

The City of Springfield operates and maintains approximately thirty-nine (39) miles of gravity wastewater lines and fourteen (14) miles of force main ranging in size from four (4) inches to twelve (12) inches. The wastewater collection system serves approximately 1,908 people within the City of Springfield. Wastewater treated by the City of Springfield averaged approximately 0.381 MGD and peaked at 0.860 MGD in 2020. The wastewater collection system currently has twenty-two (22) pump stations. The City of Springfield provides wastewater service to residents within the city limits and outside city limits, which is illustrated in Exhibit H.

4.2.3 Existing Wastewater Treatment Plant

The City of Springfield owns and operates the Springfield Water Reclamation Facilities (WRF). The location of the Springfield Water Reclamation Facilities is depicted in Exhibit H.

Springfield Water Reclamation Facility – GA0020770

The Springfield Water Reclamation Facility, located at 313 Industrial Boulevard, Rincon, Georgia 31326, is permitted through the National Pollutant Discharge Elimination System (NPDES) Permits as a Wastewater Treatment Facility through the Georgia EPD. The permit and authorization to discharge expires July 31, 2022.

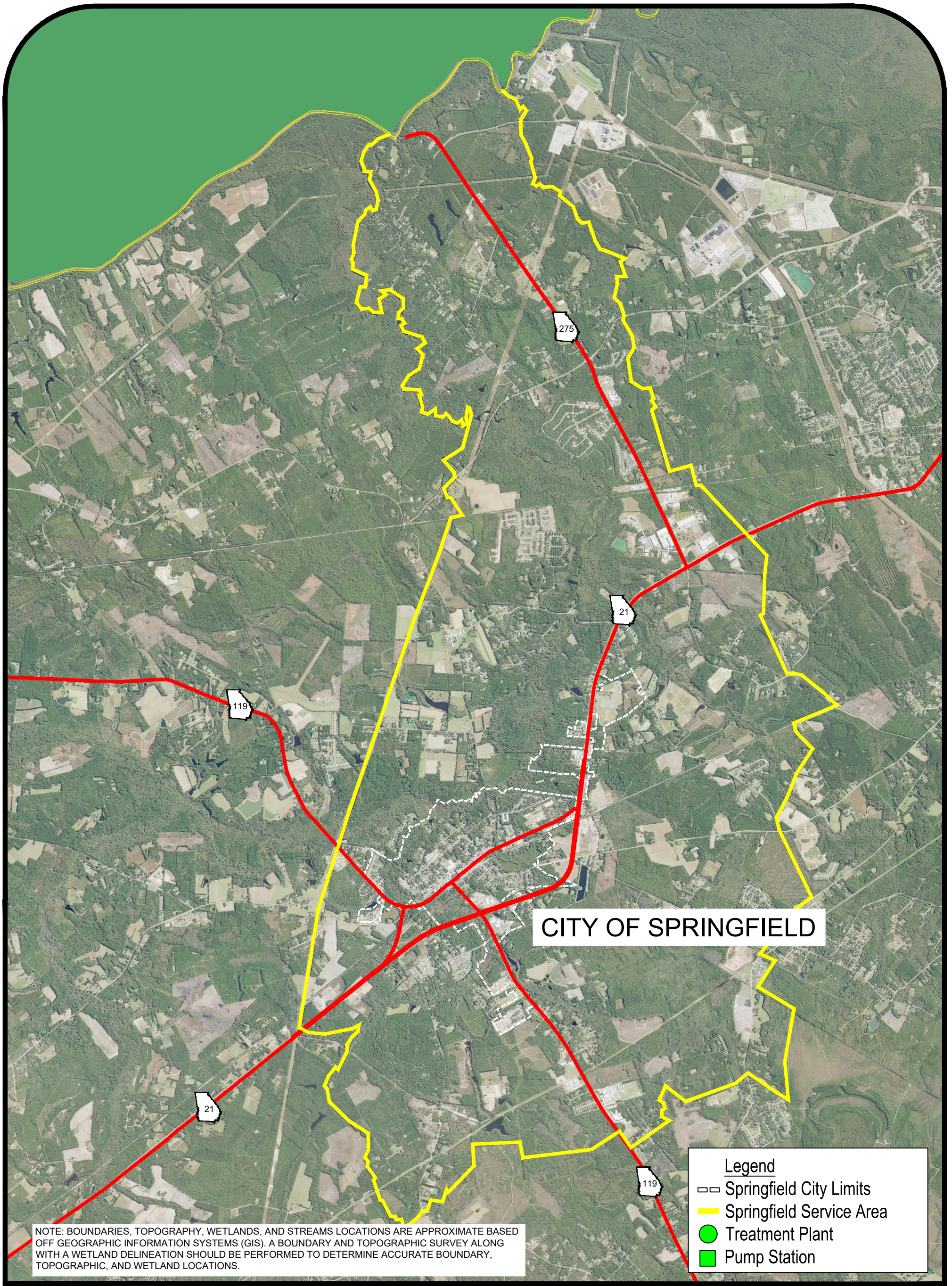

EXHIBIT H

0 750 1,500 3,000

(IN FEET)

Springfield Wastewater Service Area Map
Water and Wastewater Master Plan
Effingham County, Georgia

Project No.: 21162-2051
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The WRF processes wastewater through a series of influent screening, clarification, filtration, digestion, reject pond, and holding pond. Treated effluent is either distributed to reuse customers, land applied on spray field, or discharged to Ebenezer Creek. Reject water, which does not meet EPD reuse standards, is returned to the head of the plant for treatment. The reject pond has a volume of approximately 3,200,000 gallons. Solids are digested, dewatered, and hauled off to a permitted landfill.

Currently the discharge is limited to approximately 0.6 MGD (Monthly Average). Treated effluent is discharged in several different ways: through a Land Application System (LAS), to Water Reuse Customers, and to Ebenezer Creek. A Surface Impoundment is located at 429 Long Bridge Road, Springfield, Georgia that stores water prior to discharge at the approximately 57.9-Acre Land Application System. The LAS is divided into three (3) zones. The three (3) grassed zones have an application rate of approximately 2.5 in/week, 2.0 in/week, and 2.5 in/week, respectively. Additional flow of treated wastewater is provided to reuse customers or is discharged through Outfall #001 to Ebenezer Creek. A copy of the NPDES Permit can be found in **Appendix G**.

4.2.4 Wastewater Characteristics

The City of Springfield's wastewater is largely comprised of residential and commercial discharges. The Springfield WRF accepts process wastewater from Edwards Interiors as part of its Pretreatment Ordinance. Wastewater effluent (Treatment Plant Influent) from these waste streams are typical characteristics of domestic influent: BOD_5 – 250 mg/l, TSS – 250 mg/l, and Ammonia – 50 mg/l.

Effluent monitoring results were obtained from the 2017 NPDES Permit Application, and they have been summarized to characterize flow. The treated wastewater is reported monthly. Over this period, the average monthly wastewater flows at the WRF was approximately 346,000 gallons per day. **Table 33** below provides a summarized version of the DMR's which can be found in **Appendix G**.

Table 33: Springfield WRF Effluent Wastewater Characteristics				
Parameter	Ebenezer Creek Discharge Treatment Standard		Reuse System Discharge Treatment Standard	Effluent Characteristics
	Monthly Average	Weekly Average	Monthly Average	Average Daily
Flow (MGD)	0.6	0.75	-	0.346
BOD_5 (mg/L)	5.0	7.5	5.0	3.7
TSS (mg/L)	5.0	7.5	5.0	2.3
Ammonia (mg/L)	1.0	1.5	-	2.16
Fecal Coliform (#/100mL)	200	400	23	1
Residual Chlorine	0.02	0.02	-	0.96
pH (SU)	6.0-7.5		6.0-8.5	6.9 – 7.42
Dissolved Oxygen (Min)	6.0		-	6.7
Turbidity (NTU)	-		3.0	

4.2.5 Planned Future Wastewater Improvements

The City of Springfield's 2021 Budget includes Wastewater Expenditures and SPLOST Expenditures. The City of Springfield has funding for the Wastewater System improvements outlined in **Table 34** below.

Table 34: City of Springfield Planned Future Water Improvements	
Project Description	Estimated Expenditure
Collection System Repair & Maintenance	$55,000
Collection System Infrastructure Repairs	$50,000
WWTP Equipment Repair	$30,000
Ebenezer Road Lift Station Upgrade	$300,000
Ebenezer Road Force Main	$150,000
McCall Road Sewer Main	$100,000

4.2.6 Rate and Fee Schedule

The City of Springfield has developed a rate and fee schedule based on usage, customer location and designation. A complete rate and fee schedule can be found in **Appendix G,** and a summarized version can be found in **Table 35**.

Table 35: City of Springfield Wastewater Rate Schedule			
Customer Type	**Deposit**	**Base Rate**	**Over 2,000 Gal**
Residential-Inside City	$105 (Owner) $130 (Renter)	$18.92	$3.78 per 1,000-gal
Residential-Outside City	$105 (Owner) $130 (Renter)	$37.84	$4.73 per 1,000-gal
Commercial-Inside City	$100	$18.92	$3.78 per 1,000-gal
Commercial-Outside City	$100	$37.84	$4.73 per 1,000-gal

The United States Census estimates 2.84 persons per household (2015 – 2019) for Effingham County. The Georgia Department of Public Health Design Flows indicate wastewater systems should be designed to accommodate a flow of 75 gallons per person per day. Therefore, the average monthly usage per City of Springfield residential water customer would be expected to be approximately 6,603 gallons per month. Based on this, a residence located within City of Springfield would be charged a monthly bill of $40.1 and a residence located outside of city limits would be charged a monthly bill of $64.34.

4.2.7 Financial Position

The City of Springfield has an Audited Financial Statement completed at the end of each fiscal year to assess its financial position created over the previous twelve (12) months of operation. The City of Springfield has the Audited Financial Statement organized such that the Water and Wastewater Operations are assessed jointly. A summarized version of the 2020 Audited Financial Statement pertaining to the wastewater system can be found in Table 11 in Section 3.2.6**.** Based on the 2020 Financial Statement, the City of Springfield reported a Net Gain, through both Operating Revenues and Capital Contributions.

4.3 City of Rincon

4.3.1 Service Area and Customer Base

The City of Rincon provides wastewater service to customers within the city limits and outside city limits, as shown on the City of Rincon Wastewater Service Area Map (**Exhibit I**). **Table 36** below summarizes the Georgia EPD's Active Wastewater System Permits List updated August 2021 for the City of Rincon.

Table 36: City of Rincon Active Wastewater System Permits

Name	Permit No.	Type	Permitted Discharge (MGD)
Rincon WPCP	GA0046442	NPDES	1.0

Source: Georgia EPD Wastewater Permits dated August 2, 2021

4.3.2 Existing Wastewater Collection System

The City of Rincon did not provide nor have available information related to the length of lines in its wastewater collection system. The wastewater collection system serves approximately 4,850 people within the City of Rincon. The City of Rincon provides wastewater service to residents within the city limits and outside city limits, which is illustrated in **Exhibit I**.

4.3.3 Existing Wastewater Treatment Plant

The City of Rincon owns and operates the Rincon Water Pollution Control Plant (WPCP). The location of the Rincon WPCP is depicted in **Exhibit I**.

Rincon Water Pollution Control Plant – GA0046442

The Rincon WPCP, located at 500 Ackerman Road, Rincon, Georgia, is permitted through the National Pollutant Discharge Elimination System (NPDES) Permits as a Wastewater Treatment Facility through the Georgia EPD. The permit and authorization to discharge expires May 31, 2024.

The WPCP processes wastewater through a series of influent screening, biological treatment (activated sludge), secondary clarification, chemical addition for phosphorus removal, tertiary filtration, and UV disinfection. Treated effluent is either distributed to reuse customers, or discharged to an unnamed tributary of Sweigoffer Creek. Reject water, which does not

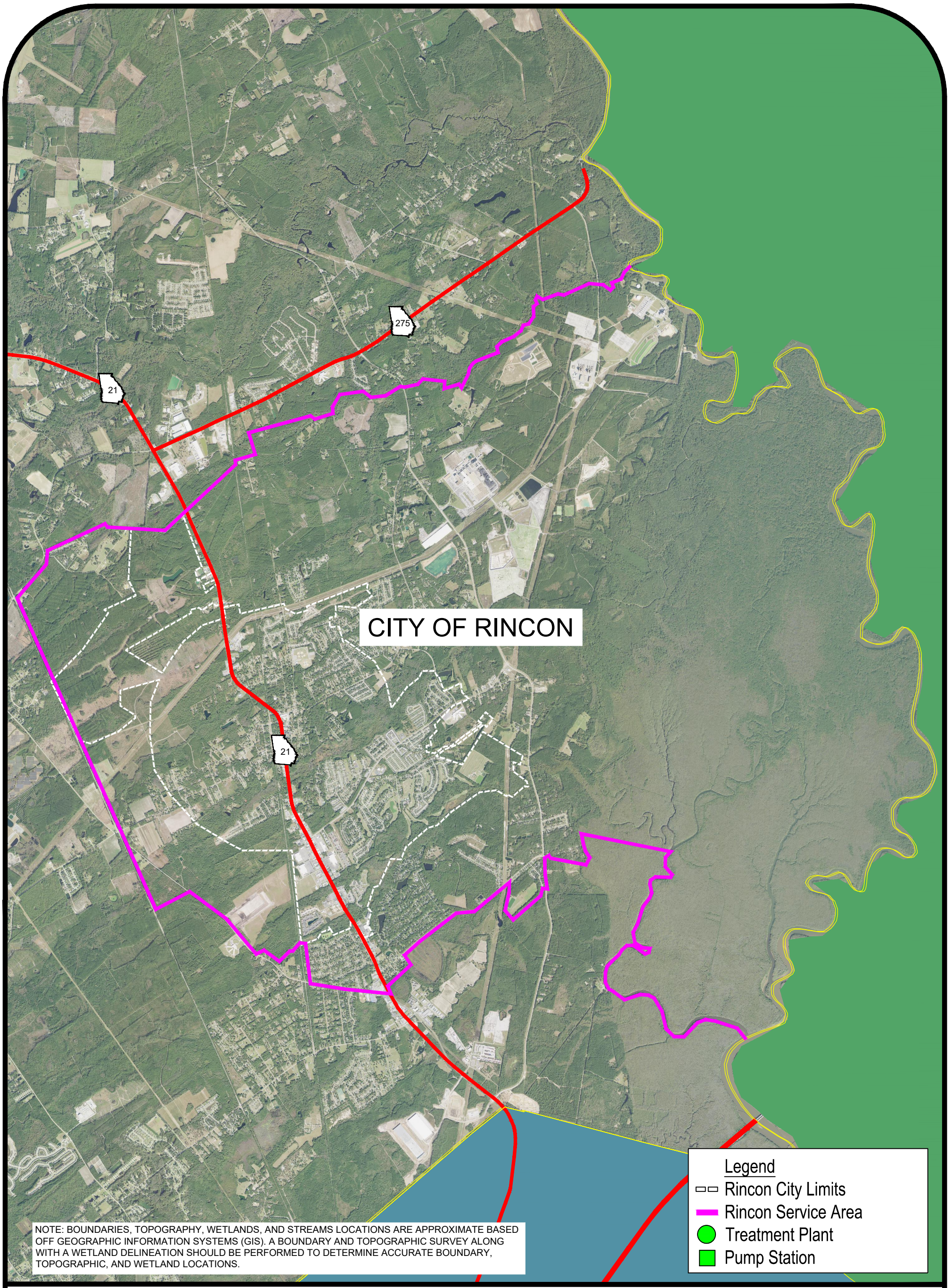

EXHIBIT I

0 750 1,500 3,000

(IN FEET)

Rincon Wastewater Service Area Map
Water and Wastewater Master Plan
Effingham County, Georgia

Project No.: 21162-2051
August 27, 2021

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Alliance Consulting Engineers, Inc.

meet EPD reuse standards, is returned to the head of the plant for treatment. The reject pond volume was unavailable for this Report. Solids are digested, dewatered, and transported to a permitted landfill.

Currently the discharge is limited to approximately 1.0 MGD (Monthly Average). Treated effluent is discharged either to Water Reuse Customers or to an unnamed tributary of Sweigoffer Creek. A copy of the NPDES Permit can be found in **Appendix H**.

4.3.4 Wastewater Characteristics

The City of Rincon's wastewater is largely comprised of residential and commercial discharges. Information regarding the City of Rincon's Industrial Pretreatment customers, if any, was unavailable. The Rincon WPCP accepts an average of 0.6 MGD of wastewater. Wastewater effluent from these waste streams are typical characteristics of domestic influent: BOD_5 – 250 mg/l, TSS – 250 mg/l, and Ammonia – 50 mg/l.

Discharge Monitoring Reports (DMRs) were obtained from the ECHO Database, for 2021, and they have been summarized to characterize flow. The treated wastewater is monitored on a weekly and monthly basis. Over this period, the average wastewater flows at the WPCP was approximately 0.6 MGD, and the peak flow averaged approximately 1.19 MGD. **Table 37** below provides a summarized version of the DMR's which can be found in **Appendix H**.

Table 37: Rincon WPCP Effluent Wastewater Characteristics

Parameter	Discharge Limitations		Characterization of Effluent Discharge	
	Monthly Average	Weekly Average	Average Daily	Maximum Daily
Flow (MGD)	1.0	1.25	0.6	1.19
BOD_5 (mg/L)	5.0	7.5	2.68	7.8
TSS (mg/L)	5.0	7.5	1.16	5.0
Fecal Coliform (#/100ml)	23	46	7.07	70
Ammonia (mg/L)	0.4	0.6	0.11	1.41
Total Phosphorus (mg/L)	1.0	1.5	0.67	2.12
pH (SU) Min – Max	6.0 – 8.0		-	-
Dissolved Oxygen (mg/L) Min	6.0		-	-

4.3.5 Planned Future Wastewater Improvements

The City of Rincon's 2021 Budget includes a Capital Improvements Plan (CIP). The City of Rincon Public Works has funding for the Wastewater System improvements, outlined in **Table 38** below, over the next five (5) years.

Table 38: City of Rincon Planned Future Wastewater System Improvements		
Fiscal Year	**Estimated Expenditure**	**Project Description**
2021	$50,000	Keller Lift Station and Manhole Repairs
2022	$250,000	Dressler Lift Station Rehab
	$250,000	Woodley Street Lift Station Rehab
2023	$250,000	Reese Pines Lift Station Rehab
	$300,000	Kates Cove Lift Station Rehab
2024	$80,000	Madison Oaks Lift Station Rehab
	$90,000	Ridgewood Lift Station Rehab
2025	$800,000	Last phase sewer on West side north of West 7th to Highway 21
Wastewater Treatment Plant Improvements		
Fiscal Year	**Estimated Expenditure**	**Project Description**
2021	$240,000	Wastewater Treatment Plant Expansion
	$15,000	Aerator Motor Backup
2022	$240,000	Wastewater Treatment Plant Expansion
	$75,000	Tractor Bush Hog Replacement
	$600,000	Purple Pipe Pilot Program
2023	$3,300,000	Wastewater Treatment Plant Expansion
	$25,000	Side by Side
	$75,000	Remodel Shop
2024	$4,200,000	Wastewater Treatment Plant Expansion
	$35,000	Access Road to Plant
	$100,000	Convert Plant lighting to LED
2025	$2,200,000	Wastewater Treatment Plant Expansion
	$35,000	Truck Replacement
	$100,000	Backhoe Tractor Replacement

4.3.6 Rate and Fee Schedule

The City of Rincon has developed a rate and fee schedule based on usage, customer designation, and customer location. A complete rate and fee schedule can be found in **Appendix D,** and a summarized version can be found in **Table 39**.

Table 39: City of Rincon Wastewater Rate Schedule					
Customer Type	**Base Rate**	**3,001 Gal – 9,000 Gal**	**9,001 Gal – 15,000 Gal**	**15,001 Gal – 45,000 Gal**	**Over 45,001 Gal**
Residential-Inside City	$22.00	$4.00 per 1,000-gal	$5.25 per 1,000-gal	$6.00 per 1,000-gal	$6.50 per 1,000-gal
Residential-Outside City	$30.00	$4.75 per 1,000-gal	$6.25 per 1,000-gal	$7.00 per 1,000-gal	$7.50 per 1,000-gal
Commercial-Inside City	$31.00	$4.25 per 1,000-gal	$5.50 per 1,000-gal	$6.25 per 1,000-gal	$6.50 per 1,000-gal
Commercial-Outside City	$44.00	$4.75 per 1,000-gal	$6.25 per 1,000-gal	$7.00 per 1,000-gal	$7.50 per 1,000-gal

The United States Census estimates 2.84 persons per household (2015 – 2019) for Effingham County. The Georgia Department of Public Health Design Flows indicate wastewater systems should be designed to accommodate a flow of 75 gallons per person per day. Therefore, the average monthly usage per City of Springfield residential water customer would be expected to be approximately 6,603 gallons per month. Based on this, a residence located within City of Springfield would be charged a monthly bill of $40.41 and a residence located outside of city limits would be charged a monthly bill of $51.86.

4.3.7 Financial Position

The City of Rincon has an Audited Financial Statement completed at the end of each fiscal year to assess its financial position created over the previous twelve (12) months of operation. The City of Rincon has the Audited Financial Statement organized such that the Water and Wastewater Operations are assessed jointly. A summarized version of the 2020 Audited Financial Statement pertaining to the wastewater system can be found in Table 16 in Section 3.3.6**.** Based on the 2020 Financial Statement, the City of Rincon reported a Net Gain. The complete 2020 Audited Financial Statement can be found in **Appendix D**.

4.4 City of Guyton

4.4.1 Service Area and Customer Base

The City of Guyton provides wastewater service within city limits and outside of city limits. **Table 40** below summarizes the Georgia EPD's Active Wastewater Permit List updated August 2021 for the City of Guyton.

Table 40: City of Guyton Active Wastewater Permits

Name	Permit No.	Type	Permitted Discharge (MGD)
Guyton WPCP	GAJ040010	Land Application System	0.146

Source: Georgia EPD Wastewater Permits dated August 2, 2021

4.4.2 Existing Wastewater Collection System

The City of Guyton operates and maintains approximately eighteen (18) miles of gravity wastewater lines and eleven (11) miles of force main ranging in size from four (4) inches to ten (10) inches. The wastewater collection system serves approximately 4,850 people within the City of Rincon. The wastewater collection system currently has seven (7) pump stations. The City of Guyton provides wastewater service to residents within the city limits and outside city limits, which is illustrated in Exhibit J.

4.4.3 Existing Wastewater Treatment Plant

The City of Guyton owns and operates the Guyton Water Pollution Control Plant (WPCP). The location of the Guyton WPCP is depicted in Exhibit J.

Guyton Water Pollution Control Plant – GAJ040010

The Guyton WPCP, located at 2000 Riverside Drive, Guyton, Georgia, is permitted as a Land Application System through the Georgia EPD. The permit and authorization to discharge expires October 31, 2026.

The WPCP processes wastewater through a series of influent screening, aerated ponds, a settling pond, a storage pond, an irrigation pump station, and sprayfields. Solids settle and stabilize at the bottom of the ponds. The ponds have a storage capacity of approximately 3,500,000 gallons. Ponds are periodically dredged and dewatered to remove the sludge, which is disposed of at a permitted landfill. Currently the discharge is limited to

EXHIBIT J

0 750 1,500 3,000

(IN FEET)

Guyton Wastewater Service Area Map Water and Wastewater Master Plan Effingham County, Georgia

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approximately 0.145 MGD (Monthly Average). The land treatment system consists of approximately 25.8 acres of Bermuda grass divided into three (3) zones. Approximately 1.68 inches are applied per week to the land treatment system. Phase II of the facility will decrease the permitted flow from 0.146 MGD to 0.049 MGD to reflect the future abandonment of Zones C and D (17.1 acres). These fields are located in the 100-year flood zone and must be decommissioned. The City of Guyton can submit a new Design Development Report and request a modification to the permit to include additional spray field sites, or apply for an NPDES permit to compensate for the loss of capacity. A copy of the LAS Permit can be found in **Appendix I**.

4.4.4 Wastewater Characteristics

The City of Guyton's wastewater is largely comprised of residential and commercial discharges. The Guyton WPCP does not accept process wastewater from industrial customers. The Guyton WPCP accepts an average of 0.6 MGD of wastewater. Wastewater effluent (treatment facility influent) from these waste streams are typical characteristics of domestic influent: BOD_5 – 250 mg/l, TSS – 250 mg/l, and Ammonia – 50 mg/l.

Effluent Monitoring Results presented in the Permit Application dated September 2017 have been summarized to characterize the effluent discharge. The treated wastewater is monitored on a monthly basis. Over the period of August 2017 through January 2018, the average wastewater flows at the WPCP was approximately 82,500 gallons per day. **Table 41** below provides a summarized version of the Effluent Monitoring Reports which can be found in **Appendix I**.

Table 41: Guyton WPCP Effluent Wastewater Characteristics

Parameter	Discharge Limitations	Characterization of Effluent Discharge*
	Monthly Average	Monthly Average
Flow (MGD)	0.146	0.0825
BOD_5 (mg/L)	50	23.7
TSS (mg/L)	50	19.4
pH	Report	-

4.4.5 Planned Future Wastewater Improvements

The City of Guyton's 2021 Budget includes a Capital Improvements Plan (CIP). The City of Guyton has funding for the Water System improvements outlined in **Table 42**.

Table 42: City of Guyton Planned Future Water Improvements	
Project Description	**Estimated Expenditure**
Linton Lane Manhole Repairs	$15,000
Mossy Hollow Pump Replacement	$10,000
WWTP Repairs and Maintenance	$20,000
Sewer Repairs and Maintenance	$55,000

4.4.6 Rate and Fee Schedule

The City of Guyton has developed a rate and fee schedule based on usage, customer designation, and customer location. A complete rate and fee schedule can be found in **Appendix E,** and a summarized version can be found in **Table 43**.

Table 43: City of Guyton Wastewater Rate Schedule								
Customer Type	**Base Rate**	**2,001 Gal – 5,000 Gal**	**5,001 Gal – 10,000 Gal**	**10,001 Gal – 20,000 Gal**	**20,00 Gal – 30,000 Gal**	**30,000 Gal – 50,000 Gal**	**Over 40,000 Gal**	**Over 50,000 Gal**
Residential	$33.71 (First 2,000 Gal)	$5.52 per 1,000-gal	$6.22 per 1,000-gal	$6.22 per 1,000-gal	-	-	-	-
Commercial	$55.90 (First 5,000 Gal)	-	$5.52 per 1,000-gal	$5.52 per 1,000-gal	$6.22 per 1,000-gal	$6.22 per 1,000-gal	-	$6.22 per 1,000-gal
Industrial	$61.25 (First 10,000 Gal)	-	-	$3.83 per 1,000-gal	$4.32 per 1,000-gal	$4.32 per 1,000-gal	-	$4.32 per 1,000-gal
Schools	$651.83 (First 40,000 Gal)	-	-	-	-	-	$4.94 per 1,000-gal	-

The United States Census estimates 2.84 persons per household (2015 – 2019) for Effingham County. The Georgia Department of Public Health Design Flows indicate wastewater systems should be designed to accommodate a flow of 75 gallons per person per day. Therefore, the average monthly usage per City of Guyton residential water customer would be expected to be approximately 6,603 gallons per month. Based on this, a residence located within City of Guyton would be charged a monthly bill of $60.24.

4.4.7 Financial Position

The City of Guyton has an Audited Financial Statement completed at the end of each fiscal year to assess its financial position created over the previous twelve (12) months of operation. The City of Guyton has the Audited Financial Statement organized such that the Water and Wastewater Operations are assessed jointly. A summarized version of the 2020 Audited Financial Statement pertaining to the wastewater system can be found in Table 21 in Section 3.4.6. Based on the 2020 Financial Statement, the City of Rincon reported a Net Gain. The complete 2020 Audited Financial Statement can be found in **Appendix E**.

5 WATER DEMAND AND WASTEWATER FLOW PROJECTIONS

The purpose of this analysis is to provide projections of the anticipated water demand and wastewater generation for the next ten (10) years throughout Effingham County in order to determine feasible alternatives for providing an adequate water source and wastewater treatment to ensure capacity for the future.

The four (4) entities in Effingham County that provide public water and wastewater service provided information regarding current water usage and wastewater flows. The water usage and wastewater flows for each of these entities, projected population growth, and proposed industrial development assist in determining the projected future water usage and wastewater flows for Effingham County.

5.1 Water Demand Projections

In order to evaluate future water supply, storage, and distribution capacities, total water usage will be projected based on the anticipated population to be served. The number of water customers was projected based on the municipal populations projected by the Georgia Governor's Office of Planning and Budget, which can be found in **Section 2.2.** This growth rate is coupled with a one percent (1%) annual increase in customers due to system expansions and economic development. The total customers of each municipal water system are then summarized in **Table 44**.

Effingham County

Effingham County served approximately 3,089 customers in 2020 based on data received from Effingham County. A majority of these users are residential, based on this, the population served is estimated to be approximately 7,540 people, using the US Census Bureau 2015 – 2019 Persons per Household for Effingham County. Based on the projections, a net increase of 1,106 customers is expected from 2020 to 2030.

City of Springfield

The City of Springfield served approximately 1,539 in 2020 based on data received from the City of Springfield. A majority of these users are residential, based on this, the population served is estimated to be approximately 4,371 people, using the US Census Bureau 2015 – 2019 Persons per Household for Effingham County. Based on the projections, a net increase of 730 customers is expected from 2020 to 2030.

City of Guyton

The City of Guyton served approximately 1,114 customers in 2020 based on data received from the City of Guyton. A majority of these users are residential, based on this, the population served is estimated to be approximately 3,164 people, using the US Census Bureau 2015 – 2019 Persons per Household for Effingham County. Based on the projections, a net increase of 483 customers is expected from 2020 to 2030.

Table 44: Water Customer Projections					
Water Service Provider	**Current (2020)**	**2024**	**2026**	**2028**	**2030**
Effingham County	3,089	3,559	3,783	4,006	4,195
City of Springfield	1,539	1,925	2,046	2,166	2,269
City of Rincon					
City of Guyton	1,114	1,355	1,440	1,525	1,597

For conceptual planning and the projection of anticipated supply needs, the average usage per customer was calculated utilizing data provided by the water service providers. The average water usage per customer calculations allow the associated water usage of each system to be expressed in terms of a typical demand associated with residential usage. **Table 45** estimates the anticipated water usage for each municipality and the potential regional system based on the projected growth and projected average water usage by 2030.

Table 45: Annual Water Usage Projections				
Water Service Provider	**Year**	**Total System Usage Gal/Yr (Oglethorpe Power Water Usage)**	**Current Permitted Capacity (Gal/Yr)**	**Surplus System Capacity (Gal/Yr)**
Effingham County	2020	285,028,693 (1,000,860,700)	1,656,735,000	370,845,607
	2024	323,528,049 (972,577,320)		377,501,344
	2026	343,856,720 (955,705,607)		357,172,674
	2028	364,131,586 (955,705,607)		336,897,807
	2030	381,348,634 (955,705,607)		319,680,760
City of Springfield	2020	176,521,558	438,000,000	261,478,442
	2024	205,046,955		232,953,045
	2026	217,930,944		220,069,056
	2028	230,780,834		207,219,166
	2030	241,692,726		196,307,274
City of Rincon	2020	Not Available	636,925,000	Not Available
	2024			
	2026			
	2028			
	2030			
City of Guyton	2020	66,239,459	260,975,000	194,735,541
	2024	73,345,478		187,629,522
	2026	77,954,093		183,020,907
	2028	82,550,510		178,424,490
	2030	86,453,703		174,521,297

Table 45 does not include elevated storage requirements to achieve minimal fire flow protection. Additionally, the projected municipal water usage does not account for increased water demand from Oglethorpe Power Corporation.

5.2 Wastewater Generation Projections

In order to evaluate future wastewater generation and treatment capacities, total wastewater usage will be projected based on the anticipated population to be served. The number of wastewater customers was projected based on the municipal populations projected by the Georgia Governor's Office of Planning and Budget, which can be found in **Section 2.2.** This growth rate is coupled with a one percent (1%) annual increase in customers due to system expansions and economic development. The total customers of each municipal wastewater system are then summarized in **Table 46**.

Effingham County

Effingham County served approximately 2,397 customers in 2020 based on data received from Effingham County. A majority of these users are residential, based on this, the population served is estimated to be approximately 6,807 people, using the US Census Bureau 2015 – 2019 Persons per Household for Effingham County. Based on the projections, a net increase of 915 customers is expected from 2020 to 2030.

City of Springfield

The City of Springfield served approximately 1,539 in 2020 based on data received from the City of Springfield. A majority of these users are residential, based on this, the population served is estimated to be approximately 4,371 people, using the US Census Bureau 2015 – 2019 Persons per Household for Effingham County. Based on the projections, a net increase of 730 customers is expected from 2020 to 2030.

City of Guyton

The City of Guyton served approximately 648 customers in 2020 based on data received from the City of Guyton. A majority of these users are residential, based on this, the population served is estimated to be approximately 1,840 people, using the US Census Bureau 2015 – 2019 Persons per Household for Effingham County. Based on the projections, a net increase of 400 customers is expected from 2020 to 2030.

Table 46: Wastewater Customer Projections

Water Service Provider	Current (2020)	2024	2026	2028	2030
Effingham County	2,397	2,810	2,987	3,163	3,312
City of Springfield	1,539	1,925	2,046	2,166	2,269
City of Rincon	Not Available				
City of Guyton	648	873	927	982	1,028

For conceptual planning and the projection of anticipated treatment needs, the average generation per customer was calculated utilizing data provided by the wastewater service providers. The average wastewater generation per customer calculations allow the associated wastewater generation of each system to be expressed in terms of a typical demand associated with residential usage. **Table 47** estimates the anticipated water usage for each municipality and the potential regional system based on the projected growth and projected average water usage by 2030.

Table 47: Annual Wastewater Generation Projections

Wastewater Service Provider	Year	Total System Generation (Gal/Yr)	Current Permitted Capacity (Gal/Yr)	Surplus System Capacity (Gal/Yr)
Effingham County	2020	193,357,329	306,600,000	113,242,671
	2024	225,897,213		80,702,787
	2026	240,091,314		66,508,686
	2028	254,247,848		52,352,152
	2030	266,269,319		40,330,681
City of Springfield	2020	176,521,558	219,000,000	42,478,442
	2024	205,046,955		13,953,045
	2026	217,930,944		1,069,056
	2028	230,780,834		-11,780,834
	2030	241,692,726		-22,692,726
City of Rincon	2020	Not Available	365,000,000	Not Available
	2024			
	2026			
	2028			
	2030			
City of Guyton	2020	31,957,909	53,290,000 17,885,000*	21,332,091
	2024	38,623,047		-20,738,047*
	2026	41,049,900		-23,164,900*
	2028	43,470,331		-25,585,331*
	2030	45,525,716		-27,640,716*

* City of Guyton WPCP will decrease the permitted flow from 0.146 MGD to 0.049 MGD to reflect the future abandonment of Zones C and D (17.1 acres). These fields are located in the 100-year flood zone and must be decommissioned.

Based on the projected increases in wastewater flows, Effingham County, City of Springfield, and the City of Guyton would be expected to need expansions of their treatment capacity over the evaluated time period. If wastewater service were regionalized between the three (3) existing wastewater service providers, there would be a combined treatment capacity of approximately 543,485,000 Gallons per Year, or approximately 1.5 MGD. This would result in a surplus in 2020, 2024, 2026, and 2028. In 2030 a deficit of 10,002,761 Gallons across the three (3) existing wastewater service providers.

6 PROPOSED EFFINGHAM COUNTY WATER SYSTEM RECOMMENDATIONS

6.1 General

While the evaluations of the Existing Water Systems in Effingham County included the City of Springfield, City of Guyton, and City of Rincon, this section will focus more on recommendations for Effingham County.

Effingham County's main priority for future Water Service to its residents and industry should be focused on Water Supply and Reliability for its long-term viability. In the short term, Effingham County will need to continue to make improvements to its Water Distribution System, but those improvements can typically be done as needed and in conjunction with new developments.

6.2 Current Water Capital Improvement Plan (CIP) Projects

6.2.1 Water Distribution System Hydraulic Model

As part of this County-Wide Water and Wastewater Study, Alliance Consulting Engineers, Inc. prepared a Hydraulic Model of Effingham County's Water Distribution System. The program selected for use with this project, WaterCAD by Bentley Software, was used to analyze steady state flow conditions for the pipeline distribution network. Beyond providing solutions to steady state simulations, the program is also capable of extended period simulations involving varying tank levels and diurnal fluctuations in demands.

6.2.2 Booster Station Implementation

Effingham County completed a new Drinking Water Booster Station that was brought online in April 2023. The Booster Station is located on the east side of Hodgeville Road less than a quarter mile north of GA Highway 30. The Booster Pump Station conveys drinking water through the existing 36-Inch Water Main along Hodgeville Road. The Booster Station has five (5) pumps, two (2) smaller pumps conveying approximately 1,050 GPM and three (3) larger pumps conveying approximately 3,300 GPM. The purpose of the Booster Station Implementation was to provide adequate, increased pressures from the City of Savannah supply water main into Effingham County's Drinking Water Distribution System, particularly with increased demand on the system.

6.2.3 Water Main Loop B

In the past, Effingham County's Water Distribution System expansion has been driven by growth, resulting in short extensions to serve new development.

As a result, the system has many dead-end pipe runs without the benefit of a looped system. As much as 3 million gallons per month is used to flush the system to maintain water quality. Therefore, the County began a series of projects to connect the ends and loop the system. The first loop following McCall Road (Water Main Loop A) was completed in 2021.

Effingham County completed Water Main Loop B along Blue Jay Road, Georgia Highway 17, and Georgia Highway 30 that was brought online in April 2023. In addition to providing water quality benefits, these loops now provide service to much of the future growth areas already rezoned and ready for residential construction.

6.2.4 Georgia International Trade Center (GITC) Water Tank

Effingham County completed the GITC Water Tank and Altitude Valve that was brought online in April 2023. The GITC Water Tank and Altitude Valve is located on the north side of Trade Center Boulevard, approximately 0.6-miles west of GA Highway 21. The Elevated Pedesphere Tank has a volume of approximately 500,000 Gallons and was installed to support the domestic and fire protection needs at required pressures of the numerous Industrial facilities recently construction in the Georgia International Trade Center.

6.2.5 Old Augusta Road Waterline Extension

Effingham County completed a Water Main Extension along Old Augusta Road to Abercorn Road that was brought online in April 2023. This project was another water main loop to improve water quality and provide service to future growth in the area.

6.3 Pending Water Capital Improvement Plan (CIP) Projects

6.3.1 Water Supply Assessment

Effingham County should evaluate augmenting the City of Savannah water supply with existing County groundwater wells in the Goshen area.

In addition, Water Utility Management has offered to Effingham County the ability to purchase Water Supply and Storage from Water Utility Management's private Water Systems. Effingham County should explore this option further to be sure it is taking advantage of infrastructure that is already in place and available from a supply and storage standpoint.

6.3.2 Water Storage Assessment

While Effingham County currently has adequate storage capacity within its Water Distribution System, Effingham County still requires Booster Pump

Stations to maintain pressure within portions of its distribution system. Effingham County should evaluate future Elevated Storage Tank elevations and placement in order to minimize the need for pumping to serve its customers.

An Elevated Storage Tank is currently planned for the Savannah Gateway Industrial Hub (SGIH) with private investment. Effingham County should evaluate an opportunity for Public-Private partnership with the ability to pay additional funds for a larger Elevated Storage Tank to provide Effingham County with additional storage for future capacity.

6.3.3 Old Augusta Road / Logistics Parkway Loop

Effingham County has Engineering Design and Construction Drawings in progress to construct a new Water Main along Old Augusta Road to create a loop in the Water Distribution System. This loop will continue to provide added flow capacity and improved pressures and circulation to existing and future customers in this area.

6.4 Potential Water Capital Improvement Plan (CIP) Projects

6.4.1 Water Supply Redundancy from New Source

While Effingham County currently has plenty of surplus capacity from the City of Savannah, ultimately up to 20.5 MGD, Effingham County should explore its own potential Surface Water Withdrawal and Water Treatment Plant (WTP) options or a northern Groundwater Well should these options ever become needed in the future. Typically, the approval process of New Water Withdrawal options is a lengthy one so planning ahead and can be of the utmost importance.

Any viable Surface Water or Groundwater Withdrawal option within Effingham County may never need to be implemented if nothing changes with the City of Savannah's water supply agreement. However, Effingham County is dependent upon the City of Savannah's water supply without a viable backup plan.

6.4.2 Water Supply to Savannah Portside International Park (SPIP)

The Savannah Portside International Park is a Class A, 160-Acre Industrial Park in Effingham County, west of Savannah. Located less than a half mile from Interstate 16, SPIP provides excellent access to the Port of Savannah and the Savannah / Hilton Head International Airport.

Effingham County should evaluate providing water supply to SPIP from either a new connection to the City of Savannah's Water System or other viable sources such as Jabaz Jones.

6.4.3 Water Main Extensions to Areas of New Growth

Effingham County should continue to explore Water Main Extensions to create system loops and provide opportunities for future growth including areas east of Springfield and areas in the southwest and west portion of Effingham County that are in close proximity to the new Hyundai Motor Group site.

6.4.4 Supervisory Control And Data Acquisition (SCADA) Improvements

Effingham County has a functional SCADA system on a Grundfos platform for its WWTP and Pump Stations but no similar system on its Water Distribution System. The County's Groundwater Wells are checked daily but connecting them to the existing Grundfos SCADA system will allow for quicker response time should an outage occur. SCADA systems would need to be installed at the following locations:

- #2 Springfield Central (Old School)
- #4 and #5 Hunter's Chase and Abbey Lane (81 Homes)
- #6 Courthouse Road (County Dry Waste / Recycling Center and Fire Station)
- #8 Southbrook (18 Homes)
- #9 Berryville (10 Homes)
- #10 I-16 Industrial Park
- #11 Greenbriar (30 Homes)

7 PROPOSED EFFINGHAM COUNTY WASTEWATER SYSTEM IMPROVEMENTS

7.1 General

While the evaluations of the Existing Water Systems in Effingham County included the City of Springfield, City of Guyton, and City of Rincon, this section will focus more on recommendations for Effingham County.

Effingham County's main priority for future Wastewater Service to its residents and industry should be focused on Wastewater Treatment and Discharge Capacity for its long-term viability. In the short term, Effingham County will need to continue to make improvements to its Wastewater Collection System, but those improvements can typically be done as needed and in conjunction with new development. The process to secure new treatment and discharge capacity is a much lengthier and costlier process.

7.2 Current Wastewater Capital Improvement Plan (CIP) Projects

7.2.1 New Wastewater Treatment Plant (WWTP)

During the course of this Master Plan, it was determined that a new Effingham County WWTP was needed and that expanding the current WWTP was not preferred given new, advanced treatment technologies and the potential costs of the expansion.

In June of 2022, Effingham County requested qualifications from Engineering Firms and began the process of a new 2-MGD WWTP, expandable in the future to 3-MGD and 4-MGD. A future wastewater treatment capacity of 4-MGD would provide Effingham County with more than adequate capacity for future residential growth for decades to come but would also provide surplus capacity to help attract and serve potential industrial prospects looking to potentially locate to Effingham County.

The new WWTP also includes a 5-MGD Reuse Pond and Septic Receiving Station. Once the new WWTP is operational, Effingham County should evaluate the benefit of rehabilitating or upgrading the existing WWTP for additional capacity.

7.2.2 Wastewater Effluent Discharge

Effingham County is currently limited in its Wastewater Effluent Discharge to its current Sprayfield capacity and the Residential Wastewater Re-Use System. While Effingham County has already begun plans to build a new 2-MGD WWTP, it will need increased disposal capacity. The following sections will review proposed, potential and preferred wastewater discharge alternatives.

In general, Effingham County prefers land application and re-use alternatives to surface water discharges, although surface water discharges will be needed for times when land application and re-use are not available such as during the winter or during rainy weather.

7.2.2.1 Little Ogeechee River / Ogeechee Run Discharge

On October 28, 2021, the Georgia Department of Natural Resources (GA DNR) Environmental Protection Division (EPD) responded to a March 2021 request from Effingham County to evaluate potential Permit Limits for a phased discharge of 2 MGD and 3 MGD treated domestic wastewater discharges into the Ogeechee Run, a tributary of the Little Ogeechee River in the Ogeechee River Basin. The letters are included in Appendix J. A map of this proposed discharge location is included on the following page in Exhibit K. Prior to the requested Wasteload Allocation (WLA), GA DNR requested a Tide Study and Dissolved Oxygen (DO) Study to determine whether the stream was meeting its designated use and there is assimilative capacity to authorize a point source discharge, due to the Total Maximum Daily Load (TMDL) for dissolved oxygen developed in 2007 and the receiving stream listed as "assessment pending" on Georgia's 2020 305(b) / 303(d) List.

Effingham County conducted a Tide Study and Salinity Study with Reports dated April 2022 and June 2022, respectively, which was provided to GA DNR for review. The Reports determined that the potential discharge location was not under tidal influence and should be considered further as a viable discharge location. These Reports are included in Appendix K.

However, GA DNR responded on September 23, 2022, that despite the findings of the Tide Study and Salinity Study that the potential discharge location did not have adequate natural flow to absorb a new wastewater effluent discharge. This response eliminated this potential discharge as a viable alternative. This letter is included in Appendix J.

7.2.2.2 Ogeechee River Discharge

On October 28, 2021, GA DNR / EPD also responded to a March 2021 request from Effingham County to evaluate potential Permit Limits for both 2 MGD and 3 MGD treated domestic wastewater discharges into the Ogeechee River in the Ogeechee River Basin. The letters are included in Appendix J. A map of this proposed discharge location is included on the previous page in Exhibit K. The EPD letter provides Recommended Permit Limits and was provided for planning purposes only. During the course of the Master Plan, Effingham County began the process as part of the new WWTP project for formal

LOW GROUND ROAD

CITY OF RINCON

SOUTH WATER RECLAMATION FACILITY
LAS PERMIT NO.: GAJ020016
PERMITTED DISCHARGE: 1.0 MGD
SPRAYFIELD FLOW: 0.272 MGD

MIDLANDS ROAD

SANDY HILL ROAD

BLUE JAY ROAD

EPD # WLA000157
DISCHARGE TO OGEEGEE RUN
2.0 - 3.0 MGD

EPD # WLA000149
DISCHARGE TO OGEEGEE RIVER
2.0 - 3.0 MGD

NOTE: BOUNDARIES, TOPOGRAPHY, WETLANDS, AND STREAMS LOCATIONS ARE APPROXIMATE BASED OFF GEOGRAPHIC INFORMATION SYSTEMS (GIS). A BOUNDARY AND TOPOGRAPHIC SURVEY ALONG WITH A WETLAND DELINEATION SHOULD BE PERFORMED TO DETERMINE ACCURATE BOUNDARY, TOPOGRAPHIC, AND WETLAND LOCATIONS.

1500 750 0 1500 4500

(IN FEET)

Project No.: 21162-2051
November 22, 2021

South Water Reclamation Facility
Waste Load Allocation
Effingham County, Georgia

EXHIBIT K

ALLIANCE CONSULTING ENGINEERS

Prepared by Alliance Consulting Engineers, Inc.

approval of this new discharge given that the Little Ogeechee River / Ogeechee Run discharge was determined not to be feasible.

As part of the new WWTP project, a new 16-Inch Wastewater Effluent Re-Use Line has been proposed from the new WWTP to the Ogeechee River discharge location.

7.2.2.3 Oglethorpe Power Corporation – Effingham Power Facility Re-Use

In 2021, Carlyle and Cogentrix completed the sale of the Effingham County Power Facility to Oglethorpe Power Corporation (OPC). The Effingham Facility is a 511 Mega-Watt (MW) operating combined-cycle generating and transmission facility located off McCall Road near the City of Rincon. The property (TMS Parcel #414-2PU) is directly adjacent to Effingham County's WWTP property (TMS Parcel #414-1). A map of the Oglethorpe Power property is included on the previous page in Exhibit K. The facility features two (2) General Electric (GE) combustion turbines and one (1) steam turbine. The facility has high cooling water needs and is currently using drinking water from the City of Savannah to address these cooling water needs.

Effingham County has been in discussions with Oglethorpe Power to provide its treated wastewater effluent up to 0.75-MGD to the Effingham Facility to replace its City of Savannah use. Effingham County's treated wastewater effluent would be a more cost-effective water supply for cooling water than the City of Savannah's drinking water. In addition, this would free up Oglethorpe Power's water demand from the City of Savannah for reallocation to Effingham County or other customers. As part of this arrangement, Effingham County would agree to take ownership of Oglethorpe's Sprayfields once the treated effluent is operational.

7.2.2.4 Low Ground Road Sprayfield Expansion

Effingham County has completed a 30% Schematic Design for an Expansion of the Sprayfield at the WWTP at Low Ground Road on property presently owned by Effingham County. Effingham County is in the process of putting together budgetary numbers to determine whether the project is cost-feasible.

7.2.2.5 University of Georgia (UGA) Sprayfield

Effingham County considered approaching the University of Georgia regarding two (2) properties, totaling approximately 206-Acres (TMS Parcel #352-38 and Parcel #353-4, off US Highway 17, just south of Noel Conaway Road, regarding a potential lease for a land application system but was not pursued. A map of the University of Georgia property is included in Exhibit K.

This property is in close proximity to Effingham County's existing Wastewater Re-Use System.

7.2.3 Wastewater Collection System Hydraulic Evaluation

Hydraulic evaluations of a simplified version of the wastewater collection system in Effingham County were performed to assess existing and future conditions for the provision of wastewater service throughout the County, particularly related to the pump stations and force mains that are used to convey wastewater over the longest distances within the County to the Low Ground Road WWTP. The Hydraulic Evaluation focuses mainly on the contributing flows to each pump station compared to its Design Flow Rate as well as the velocities of the Design Flow Rate in the downstream Force Main to determine if the existing Force Mains have capacity for increased flow rate in the future to determine at which point Force Main upgrades may be required to convey additional flow.

The Hodgeville Road Pump Station has a current pumping capacity of 1,650 GPM conveyed through a 12-Inch PVC Force Main directly to the Effingham County WWTP along Hodgeville Road, Blue Jay Road, and utility right-of-way at a velocity of 4.7 feet per second (FPS). The Hodgeville Road Pump Station collects wastewater from the following pump stations: (1) Park West Pump Station, (2) Summer Station, (3) Learning Treehouse, (4) Blandford Elementary, (5) Exley Tract, (6) Cedar Ridge, (7) Saddle Club at Belmont Glen, and (8) South Effingham Elementary Pump Station, as well as collecting wastewater from the Belmont Glen East Subdivision.

The 12-Inch PVC Force Main from the Hodgeville Road Pump Station to the Effingham County WWTP also collects and conveys flows from the following pump stations: (1) Timberlake Pump Station, (2) Greystone Pump Station, (3) Staffordshire Pump Station, and (4) Blandford Crossing Pump Station.

The Park West Pump Station has a current pumping capacity of 850 GPM conveyed through a 12-Inch PVC Force Main along Noel Conaway Road, Kolic Helmey Road, and Hodgeville Road. The Park West Pump Station collects wastewater from the following pump stations: (1) Creekside Pump Station, (2) Settler's Point Pump Station, (3) The Woodlands Pump Station, (4) South Bend Pump Station, and (5) Park West Phase II Pump Station.

The Park West Phase II Pump Station collects wastewater from two (2) pump stations upstream, Park West 4AB Pump Station and Park West 5A Pump Station. The South Bend Pump Station collects wastewater from six (6) pump stations upstream: the Buckingham Pump Station, Laurel Grove Pump Station, Laurel Mill Pump Station, Windfield Pump Station, Marlow Elementary Pump Station and Covered Bridge Pump Station.

In summary the Park West Pump Station collects wastewater from fourteen (14) Pump Stations, and the Hodgeville Road Pump Station collects wastewater from twenty-five (25) Pump Stations, making these two (2) Pump Stations critical to Effingham County's Wastewater Collection System. The Hydraulic Evaluation shows both of these Pump Stations near capacity. Effingham County should closely monitor current run times and evaluate any future requests to connect to the infrastructure of those two (2) Pump Stations.

The Pump Stations contributing to the Hodgeville Road Pump Station and Park West Pump Station serve current development in the Noel Conaway Road, Kolic Helmey Road, and Hodgeville Road corridors. The pump stations that connect directly to the Hodgeville Road Pump Station Force Main serve current development in the Blue Jay Road corridor. The above referenced wastewater infrastructure covers the south central portion of the County.

The southeastern portion of the County is served by the Exley Pump Station, which has a current pumping capacity of 1,150 GPM conveyed through a 12-Inch PVC Force Main along Trade Center Boulevard, Commerce Court, Goshen Road, and Hodgeville Road to the Hodgeville Road Pump Station. The Exley Pump Station collects wastewater from the following pump stations: (1) GITC Pump Station, (2) Jasper Village Pump Station, (3) Blandford Elementary Pump Station, (4) Learning Treehouse Pump Station, (5) Summer Station Pump Station, (6) Red Oak Pump Station, and (7) Cedar Ridge Pump Station.

The area north of the Exley Pump Station and east of the Effingham County WWTP is served by the City of Rincon. The area north of the Effingham County WWTP is served by the City of Springfield and the City of Guyton. The greatest potential for growth on Effingham County's Wastewater Collection System is to the west and southwest of the WWTP.

7.2.4 Hodgeville Road Pump Station (Lift Station No. 4) Upgrade

As noted in the previous section, the Hodgeville Road Pump Station and Force Main collects and conveys a majority of the wastewater to Effingham County's WWTP. As Effingham County pursues a new 2-MGD WWTP, expandable to 3-MGD and 4-MGD, it will be come critical that the Wastewater Collection System infrastructure is also prepared to convey the additional flows.

Effingham County has Engineering Design and Construction Drawings in progress to upgrade the Hodgeville Road Pump Station from 1,650-GPM to 2,400-GPM, and ultimately to 3,300-GPM.

The 3,300-GPM Pump Station should adequately convey the 2-MGD to 4-MGD capacity of the proposed Effingham County WWTP.

7.2.5 Hodgeville Road Force Main Upgrade

Effingham County has Engineering Design and Construction Drawings in progress to upgrade the Hodgeville Road Force Main to a proposed 18-Inch Force Main.

At the minimum required 2 FPS, an 18-Inch Force Main would convey approximately 1,600 GPM. At 5 FPS, an 18-Inch Force Main would convey approximately 4,000 GPM. The 18-Inch Force Main should adequately convey the 2-MGD to 4-MGD capacity of the proposed Effingham County WWTP.

7.2.6 Savannah Portside International Park (SPIP) Wastewater Connection

The Savannah Portside International Park is located along I-16 in the southwestern corner of Effingham County. The site is approximately ten (10) miles from the nearest Effingham County Wastewater Collection System infrastructure, specifically the Windfield Pump Station that has a flow rate of approximately 400 GPM.

In order to serve Industrial Prospects with potentially significant wastewater flows, upgrades to Effingham County's Wastewater Collection System between the Winfield Pump Station and the Effingham County WWTP would be required.

Given the SPIP's proximity to Chatham County, Bryan County, and the Hyundai Motor Group site, Effingham County should investigate potential wastewater collection system connections to systems in those counties given the closer proximity.

7.2.7 Savannah Gateway Industrial Hub (SGIH) Sprayfield

The Savannah Gateway Industrial Hub (SGIH) is located approximately two (2) to three (3) miles south of the Effingham County WWTP and portions of the property could be used for additional Sprayfield. While Effingham County pursues Surface Water Discharge alternatives, the preference is to continue to maximize the amounted of treated effluent that can be discharged to minimize the Surface Water Discharge.

Effingham County would need to conduct a Preliminary Soil Feasibility Study to clearly understand the potential feasibility and capacity of a Sprayfield on the SGIH property.

7.2.8 Wastewater Service Expansion

Effingham County is currently seeing requests for residential development in the area of Georgia Highway 17 and Blue Jay Road, as well as the Midland Road corridor, specifically on the 288-Acre T&T Property. The closest

Wastewater Collection infrastructure along Midland Road is the 10-Inch Force Main from the South Bend Pump Station along Noel Conaway Road. However, as previously noted, the infrastructure in this area to the Effingham County WWTP is at or near capacity. Effingham County should consider any new wastewater infrastructure in the Midland Road corridor to be conveyed to the north to Blue Jay Road and then east toward the Effingham County WWTP. This will put new wastewater infrastructure in undeveloped areas and keep additional flows off presently loaded infrastructure. Effingham County could also consider re-directing wastewater infrastructure in the Nease Road corridor to the Midland Road corridor to free up capacity in the existing system.

7.3 Potential Wastewater Capital Improvement Plan (CIP) Projects

7.3.1 Regional Wastewater Pump Stations for Future Areas of Growth

Effingham County should explore constructing new Regional Wastewater Pump Stations in the southwest and western portions of the County where future growth is targeted due to proximity to the Hyundai Motor Group site.

Given the proximity to Chatham County and Bryan County, Effingham County should explore either a potentially new WWTP or interconnection to wastewater systems in Chatham County or Bryan County rather than conveying wastewater over long distances back to the existing Effingham County WWTP.

8 REGIONALIZATION OF WATER AND WASTEWATER SERVICES

At present, Effingham County, the City of Springfield, the City of Rincon, and the City of Guyton own and pursue individual water supply sources, water treatment systems, wastewater treatment systems, and wastewater discharges. Given the future water and wastewater needs of the County, region, and State plus the tightening regulations and increasing challenges regarding Water Withdrawal and Wastewater Effluent Discharge, Effingham County and the municipalities should consider regionalization efforts specifically related to Water Supply and Treatment and Wastewater Treatment and Disposal, while each maintaining ownership and control of the individual water distribution and wastewater collection systems. This will help take advantage of and expand upon existing Water Treatment and Storage and Wastewater Treatment and Disposal Infrastructure in a way that is advantageous to Effingham County, the City of Springfield, the City of Rincon, and the City of Guyton, as well as all of their customers and future customers. Effingham County should consult legal and financial consultants for more details on the different options available, if the stakeholders are willing to pursue this regionalization effort.

9 CONCLUSIONS AND RECOMMENDATIONS

Effingham County is to be commended for commissioning this study to evaluate the current condition of each public water and wastewater system within the County, evaluate its short-term and long-term improvements needed, and determine the feasibility of a forming a regional water and wastewater partnership to continue to secure its water and wastewater needs for its citizens. There is no doubt that the availability of adequate water and wastewater service is an absolute necessity to facilitate continued growth and attract industrial and economic development.

In this Water and Wastewater Master Plan, Alliance Consulting Engineers, Inc. has addressed the condition of the existing water and wastewater infrastructure, as well as the capital improvements that are already under way. While many of these capital improvements involve Drinking Water Distribution System improvements and Wastewater Collection System Improvements, Effingham County has started to address the future Wastewater Treatment and Discharge needs that it will have in order to continue to support the significant growth in Effingham County's population. In addition to the Wastewater Treatment and Discharge capacity that Effingham County should continue to develop, Effingham County should consider developing its own Drinking Water Supply sources to potentially, in the future, replace the City of Savannah water supply. This could be due to rising Drinking Water wholesale rates from the City of Savannah or potential saltwater intrusion into the City of Savannah's source. It should be noted that developing new Water Supply sources and Treated Wastewater Discharge locations and capacities can be a lengthy process and should be started well in advance of their intended need.

To improve its Drinking Water Distribution System, Effingham County should continue to pursue Water Main Looping projects that will improve system pressures, circulation which improves water quality and provides water mains for future growth.

Future Wastewater Collection System improvements will be driven by areas of future development. Where possible, Effingham County should evaluate re-routing of certain Force Mains to free up capacity in its existing system.

In order to fund these continued Water and Wastewater System Improvements, Effingham County should periodically evaluate its Water and Wastewater Fees in order to ensure it can adequately fund its Capital Improvement Program (CIP).

As a result of the findings and recommendations of this study, it is sincerely hoped that the public water and wastewater providers in Effingham County can now begin discussions on how they might cooperatively work together to improve the availability and quality of water and wastewater infrastructure and use it to support the continued growth and development of Effingham County.

Countywide Water and Wastewater Master Plan

Effingham County, Georgia

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