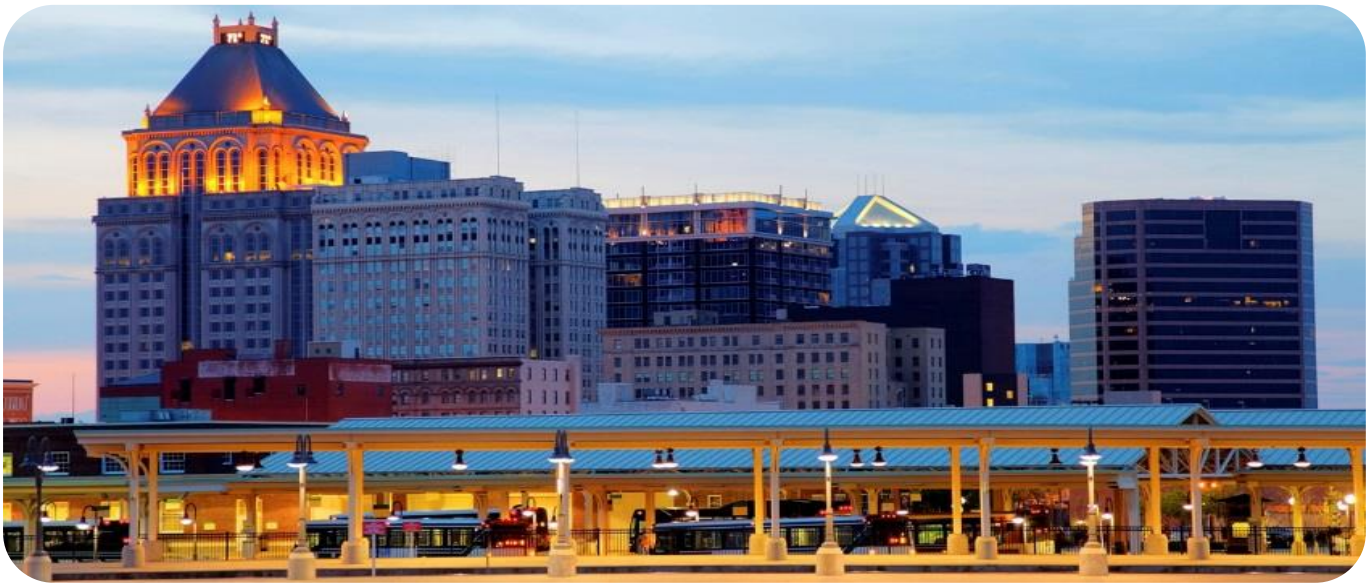
CITY OF GREENSBORO, NORTH CAROLINA

WATER & WASTEWATER SYSTEM DEVELOPMENT FEE STUDY – MARCH 2023



WILLDAN
FINANCIAL SERVICES

March 30, 2023

Ms. Jana C. Stewart, PE, Engineering Manager
Department of Water Resources
City of Greensboro
PO Box 1170
Greensboro, NC 27402-1170

Subject: Water and Wastewater System Development Fee Study - 2023

Dear Ms. Stewart,

WILLDAN FINANCIAL SERVICES ("Willdan") is pleased to submit to the City of Greensboro, North Carolina (the "City") the Water and Wastewater System Development Fee Study report (the "Report") for your consideration. We have completed the analyses for the review and development of water and wastewater system development fees and have summarized the results herein.

GENERAL

System development fees ("SDF" or "SDFs") and other comparable charges are often referred to by a number of different terms including impact fees, capacity fees, system expansion fees, availability fees, connection fees, capacity reservation charges, facility fees, capital connection charges or other such terminology. In general, an SDF is a one-time charge implemented to recover (in whole or part) the costs associated with capital investments made by a utility system to make service available to future users of the system. Such capital costs generally include the construction of facilities as well as engineering, surveys, land, financing, legal and administrative costs. It has become common practice for water and wastewater utility systems to implement SDF (or other similar charges) in order to establish a supplemental source of funding for future capital projects. This practice helps to mitigate the need for existing customers to pay for system expansions entirely through increased user rates.

CRITERIA FOR SYSTEM DEVELOPMENT FEES

The purpose of a SDF is to assign, to the extent practical, growth-related capital costs to those customers responsible for such additional costs. To the extent that new population growth imposes identifiable additional capital costs to municipal services, equity and prudent financial practice necessitate the assignment of such costs to those customers or system users responsible for the

additional costs rather than the existing user base. Generally, this practice has been labeled as "growth paying for growth" without placing the full cost burden on existing users.

It is important to note that an SDF is different than an assessment or tax. A special assessment is predicated upon an estimated increment in value to the property assessed by virtue of the improvement being constructed in the vicinity of the property. Further, the assessment must be directly and reasonably related to the benefit of which the property receives. SDFs are not directly related to the value of the improvement to the property but rather to the usage of the facilities required by the property. Until the property is put to use (i.e., developed), there is no burden placed upon the servicing facilities and the land use may be entirely unrelated to the value of the assessment basis of the underlying land. With respect to a comparison to taxes, SDFs are distinguishable primarily in the direct relationship between the amount charged and the measurable quantity of public facilities required. In the case of taxation, there is no requirement that the payment be in proportion to the quantity of public services consumed, and funds received by a municipality from taxes can be expended for any legitimate public purpose.

LEGAL CONSIDERATIONS

Court Proceedings - General

Generally, courts throughout the United States have found that capacity-related fees associated with new customer connections to utility systems are legal as long as they meet a Rational Nexus Test. In accordance with common court rulings, the rational nexus test requires that certain conditions be met in order to have a valid capacity-related fee. Typically, the court decisions have found that such fees are valid if the following standards are met:

1. The required payment should primarily benefit those who must pay it because they receive a special benefit or service as a result of improvements made with the proceeds.

2. Proceeds from the required SDF payments are dedicated solely to the capital improvement projects (i.e., proceeds are not placed in a general fund to be spent on ongoing expenses and maintenance, which characterizes a tax, but are set aside in a restricted reserve fund).

3. The revenue generated by the required payment should not exceed the cost of capital improvements to the system; and

4. The required payments are imposed uniformly and equitably on all new customers based on their anticipated usage (i.e., a relationship between the fees paid and the benefits received).

In general, most courts have found that it is reasonable for utility systems to take steps to ensure that there are adequate funds for capital projects, and to set aside collected fees in a special account for that purpose. Additionally, new customers are treated alike in that all must pay a fee based on

anticipated usage and/or potential demand. Finally, courts have reasoned that it is rational for a utility system to prepare to pay for future capital projects and, while imposing a capacity-related fee may not be the only way to raise such funds, it is a reasonable and legitimate method of accruing funds.

Court Proceedings – North Carolina

In 1990, a precedent was set in the State of North Carolina in a decision by the United States Court of Appeals, Fourth District for the case of Shell Island Investment v. Town of Wrightsville Beach North Carolina (900 F.2d 255), regarding the right of the Town of Wrightsville Beach to impose utility system impact fees to fund the expansion of the water and sewer facilities. The Court of Appeals upheld the decision of the United States District Court for the Eastern District of North Carolina that the Town of Wrightsville Beach had "authority to impose impact and tap fees under the Public Enterprise statute and that no specific enabling legislation is necessary."

Pursuant to the ruling of the District Court and the Court of Appeals, it was concluded that "despite the absence of any express authorization in the Public Enterprise Statute for municipalities to establish or increase utility fees in order to offset future capital improvements to their sewer and water infrastructures, general authority to do so is implicit in relevant state law, limited only by the requirement that any discrimination among users be not based on arbitrary or unreasonable classifications."

Court Proceedings – Town of Carthage Case

On April 8, 2016, in the case of Quality Built Homes, Inc. v. Town of Carthage, (766 S.E. 2d 897) the North Carolina Court of Appeals held that the Town of Carthage possessed authority to charge "impact fees" for water and sewer services. However, on August 16, 2016, the North Carolina Supreme Court reversed the North Carolina Court of Appeals' decision and held that the Town did not possess authority to charge impact fees for water and sewer services. Although there were many different factors influencing this decision, the result generated a significant amount of confusion and concern for governmental utility systems within the State.

House Bill 436

In 2017, the General Assembly of North Carolina enacted House Bill 436, which included a general statute under Section 1, Chapter 162A, Article 8 for the development of "System Development Fees" (herein referred to as "Chapter 162A") that impacts all governmental entities in North Carolina who currently assess fees for the recovery of capital costs associated with new development and system growth. As defined in Chapter 162A, a system development fee is a charge or assessment for service imposed with respect to new development to fund costs of capital improvements necessitated by and attributable to such new development, to recoup costs of existing facilities which serve such new development, or a combination of those costs. Based on requirements of Chapter 162A, the calculation of the SDFs, must employ generally accepted accounting, engineering, and planning methodologies. Defined methodologies include the buy-in method, incremental or marginal cost method, and combined cost method. A brief description of each of these methods as defined in American Water Works Association Manual M1 is provided below.

- *Buy-in Method.* Based on the value of the existing system's capacity. Under this method, new development "buys" a proportionate share of capacity at the cost (value) of the existing facilities.
- *Incremental/Marginal Cost Method*. Based on the value or cost to expand the existing system's capacity. This method assigns to new development the incremental cost of future system expansion needed to serve new development.
- *Combined Cost Method*. Based on blended value of both the existing and expanded system capacity. This method uses a combination of the buy-in and incremental/marginal cost methods.

Chapter 162A allows a governmental unit to utilize any of the three methods described above depending on the availability of information from the governmental unit, i.e., a detailed listing of asset data (buy-in method) or a ten to twenty-year capital improvement plan (incremental method). The combined method includes both existing assets and future capital projects required to serve growth.

Chapter 162A states that an SDF shall be calculated based on a written analysis, which may constitute or be included in a capital plan, that:

1. Is prepared by a financial professional or a licensed professional engineer qualified by experience and training or education to employ generally accepted accounting, engineering, and planning methodologies to calculate system development fees for public water and sewer systems.
2. Documents in reasonable detail the facts and data used in the analysis and their sufficiency and reliability.
3. Employs generally accepted accounting, engineering, and planning methodologies, including the buy-in, incremental cost or marginal cost, and combined cost methods for each service, setting forth appropriate analysis as to the consideration and selection of a method appropriate to the circumstances and adapted as necessary to satisfy all requirements of this Article.
4. Documents and demonstrates the reliable application of the methodologies to the facts and data, including all reasoning, analysis, and interim calculations underlying each identifiable component of the system development fee and the aggregate thereof.
5. Identifies all assumptions and limiting conditions affecting the analysis and demonstrates that they do not materially undermine the reliability of conclusions reached.
6. Calculates a final system development fee per service unit of new development and includes an equivalency or conversion table for use in determining the fees applicable for various categories of demand.
7. Covers a planning horizon of not less than 10 years nor more than 20 years.
8. Is adopted by resolution or ordinance of the local governmental unit in accordance with G.S. 162A-209.
9. Uses the gallons per day per service unit that the local governmental unit applies to its water or sewer system engineering or planning purposes for water or sewer, as appropriate, in calculating the system development fee. (2017-138, s. 1; 2018-34, s. 1(a); 2021-76, s. 2.)

Further, Chapter 162A includes certain other minimum requirements as follows:

1. A system development fee shall not exceed that calculated based on the system development fee analysis.
2. Credits must be included no matter which methodology is used. A more detailed discussion on the applicable credits will be included in later sections of this Report.
3. A construction or contribution credit shall be given with respect to new development such that the governmental unit will credit the value of costs in excess of a development's proportionate share of connecting facilities required to be oversized for the use of others outside the development.

As such, this Report is intended to address the legal requirements set forth above to develop fees in accordance with Chapter 162A.

ADOPTION AND PERIODIC REVIEW OF SDF ANALYSIS

Upon completion of the SDF analysis, Chapter 162A sets forth certain criteria regarding the adoption and periodic review of SDFs. These include the following:

1. For not less than 45 days prior to consideration for adoption of the SDF analysis, the governmental unit shall post the analysis on its website and solicit and furnish a means to submit written comments which shall be considered by the preparer for possible modifications or revisions to the analysis.
2. Following expiration of the 45 days posting period, the governing body shall conduct a public hearing prior to considering adopting the analysis with any modifications.
3. The governmental unit shall publish the SDFs in its annual budget, rate plan or ordinance. Further, the SDF analysis shall be updated at least every five years.

EXISTING SYSTEM DEVELOPMENT FEES

The City currently imposes SDFs to new customers requiring water and/or wastewater utility service. The current fees are $980 and $990 per residential dwelling unit, for water and wastewater, respectively. For new, nonresidential/commercial customers, the fee is based on the size of the water meter. The current fees and fee structure were developed and adopted in accordance with the Chapter 162A requirements.

EXISTING METER SET FEES

The City currently imposes meter set fees to new customers connecting to the water and wastewater systems. However, it is important to note that such connection-related fees are

different than the SDFs developed and proposed herein. The distinguishing characteristic is that the meter set fees are established for the purpose of recovering the costs associated with performing the customer service act of physically making a new system connection (i.e., meter, labor, equipment, vehicles, etc.) SDFs, on the other hand, are established for the purpose of recovering the major capital costs incurred in making water and wastewater utility service available to the general public. The proposed fees designed herein are intended to be in addition to the existing meter set fees. As such, it is proposed that the existing meter set fees continue to be imposed. It should be noted that, for the purpose of the Report, the existing meter set fees are assumed to recover the costs associated with these items. A review of these fees in relation to actual costs incurred is beyond the scope of this Report.

EXISTING & PROJECTED CAPITAL FACILITIES

Existing Facilities – Buy-In Method

In considering the recovery of existing asset costs under the buy-in method, the general concept is that new customers "buy" a proportionate share of system capacity at the value of the existing facilities. It is important to note that while this methodology is labeled as *buy-in*, payment of an SDF does not transfer any ownership of the assets to the customer. Rather, such payment provides access to capacity at a status equal to that of existing customers of the system.

While there are different methods that can be used to establish a value to the existing facilities, a common approach is to value the existing assets at a replacement cost amount. According to the replacement cost method, the existing system components are valued at the estimated current cost of replacing the facilities. The analysis developed herein uses an approach referred to as Replacement Cost New Less Depreciation (RCNLD). Applying the RCNLD method, the original costs are escalated to current dollars through the use of construction cost indices, and then the result is adjusted down for the accumulated depreciation, which is also adjusted by the construction cost indices. This approach results in a replacement cost valuation that reflects the remaining depreciable life of the facilities.

In performing the RCNLD analysis, the City provided a detailed listing of the current water and wastewater system facilities (the "Asset Listing"). The Asset Listing contained the original cost, the date placed in service and the accumulated depreciation for each asset. The replacement cost of each asset is estimated by using construction cost indices information contained in the Handy-Whitman Index of Public Utility Construction Costs for the South Atlantic Region. The Handy-Whitman Index calculates the cost trends for different types of utility construction, including water systems. The published indices are used by regulatory bodies, operating entities, utility systems, service companies, valuation experts and insurance companies. The Handy-Whitman Index values are widely used to trend earlier valuations and original cost records to estimate replacement cost at prices prevailing at a certain date or to the present. While many general construction cost indexes are published, the Handy-Whitman Index is used in this analysis because it is specifically tailored to the utility industry.

After the replacement cost is calculated for each individual asset item, the adjusted accumulated depreciation is deducted for each asset item. The result is the RCNLD. The asset data and applicable recoverable cost allocations are provided in **Exhibit 1** at the end of this Report. The existing capital facilities and RCNLD calculations are summarized in **Table 1**.

TABLE 1
SUMMARY OF EXISTING FACILITIES

Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
Utility Assets:				
Business-Admin	$ 30,024,199	$ 30,024,203	$ (8,332,978)	$ 21,691,225
Customer Service-Billing	3,963,207	3,963,206	(3,924,368)	38,838
Meter Shop	114,751	428,464	(409,581)	18,883
Water Source	28,630,326	101,771,232	(51,751,082)	50,020,150
Water Treatment	142,005,777	306,639,273	(143,302,181)	163,337,092
Booster Stations & Water Tanks	24,751,040	130,612,851	(89,241,703)	41,371,148
Water Lines	145,167,426	524,688,773	(390,433,162)	134,255,611
Sewer Lines	297,462,156	1,062,417,820	(760,522,118)	301,895,702
Sewer Lift Stations	65,886,868	100,464,202	(36,157,905)	64,306,297
Wastewater Treatment	274,989,091	672,066,500	(462,982,583)	209,083,917
Contributions to Other Governments	89,440,373	150,825,932	(35,890,286)	114,935,646
Total	$1,102,435,214	$3,083,902,456	$(1,982,947,947)	$1,100,954,509

For the purpose of SDF analyses, the existing assets are categorized based on the major components of **Treatment** and **Transmission**. The treatment category includes the treatment plant facilities (water and wastewater) and accompanying supply and storage facilities (water only), as well as wastewater effluent disposal facilities. The transmission/collection category consists of major water mains, water pumping facilities, sewer lift stations and collection lines. Since the localized distribution and collection facilities are generally contributed by developers or funded from other sources (i.e., assessments, direct customer payments, etc.), these facilities are not included for recovery through the SDFs. Additionally, a cost limit or threshold has been set at $100,000 as a condition of inclusion of the asset items in the SDF calculation. The cost limit is based on the assumption that any asset item that costs less than the limit amount is not a major facility that provides a system-wide benefit. A final adjustment was made to exclude certain asset items that were identified as projects that only restored existing capacity rather than provided system upgrades or additional system capacity. The existing recoverable water and wastewater capital asset cost allocations included in the analysis are summarized in **Table 2**.

TABLE 2
SUMMARY OF EXISTING RECOVERABLE FACILITIES

Description	RCNLD Included For Recovery		
	Water	Wastewater	Total
Utility Assets:			
Business-Admin	$ 0	$ 0	$ 0
Customer Service-Billing	0	0	0
Meter Shop	0	0	0
Water Source	49,582,203	0	49,582,203
Water Treatment	160,948,837	0	160,948,837
Booster Stations & Water Tanks	34,909,868	0	34,909,868
Water Lines	90,137,033	0	90,137,033
Sewer Lines	0	208,211,461	208,211,461
Sewer Lift Stations	0	55,605,166	55,605,166
Wastewater Treatment	0	198,688,735	198,688,735
Contributions to Other Governments	114,935,646	0	114,935,646
Total	$ 450,513,587	$ 462,505,362	$ 913,018,949

Capital Improvements Program – Incremental Cost Method

In considering the recovery of future asset costs under the incremental cost method, the general concept is to assign to new development the incremental cost of future system expansion needed to serve the new development. When using this method, Chapter 162A requires a minimum 5-year to 20-year capital improvements program ("CIP") that identifies the costs associated with new capacity and the timing of the expenditures. It is also important to consider the planned funding sources for the projects identified in the CIP. For example, projects that are funded from grants or developer contributions are excluded from the SDF calculation since these are costs that are not incurred by the utility.

The SDFs developed herein utilize the incremental cost method and therefore include future capital improvement projects and their applicable additions to system capacity. The City has adopted a CIP that provides a listing of individual projects and anticipated construction costs for fiscal years 2024 through 2033 (i.e., a 10-year CIP). The CIP is provided in **Exhibit 2**. Similar to the rationale for excluding certain existing assets from recovery through SDFs, the CIP project costs included for capital recovery in the analysis consist of only those projects associated with system-wide upgrades or expansions. As such, projects related to general maintenance (i.e., renewal and replacement of existing facilities) or localized facilities that benefit only certain customers are excluded from recovery through the SDFs. The CIP and resulting identification of assumed growth-related projects (i.e., project costs recoverable from SDFs) are provided in **Exhibit 3**. The Exhibit also provides a summary allocation of the recoverable costs between the

treatment and transmission components. The projected growth-related projects and capital costs included in the analysis are summarized in **Table 3**.

TABLE 3
SUMMARY OF CIP

Description	Recoverable Capital	Excluded Capital	Total CIP
Water Summary:			
Treatment Projects	$ 108,955,650	$ 379,002,850	$ 487,958,500
Transmission Projects	166,378,357	156,934,525	323,312,882
Other Projects	0	0	0
Subtotal	$ 275,334,007	$ 535,937,375	$ 811,271,382
Wastewater Summary:			
Treatment Projects	$ 114,228,146	$ 62,858,249	$ 177,086,395
Transmission Projects	227,850,669	137,054,857	364,905,526
Other Projects	0	0	0
Subtotal	$ 342,078,815	$ 199,913,106	$ 541,991,921
Combined Summary:			
Treatment Projects	$ 223,183,796	$ 441,861,099	$ 665,044,895
Transmission Projects	394,229,026	293,989,382	688,218,408
Other Projects	0	0	0
Total	$ 617,412,822	$ 735,850,481	$ 1,353,263,303

Total Facilities – Combined Method

The analysis developed herein for calculation of the SDFs proposes the combined method. As the name implies, the combined method includes the cost/value of both the existing facilities currently providing service, as well as the planned facilities required to perpetuate or expand service. This method assumes that the utility has capacity within the existing system is sufficient to serve near-term growth but will require additional capacity to serve future growth needs. Using this method, new customers pay an SDF that reflects the value of both existing and planned capacity. The combined system costs included for recovery are summarized in **Table 4**.

TABLE 4
SUMMARY OF COMBINED RECOVERABLE FACILITIES

Description	Combined Recoverable Facilities		
	Water	Wastewater	Total
Existing Facilities:			
Treatment Facilities	$ 308,140,579	$ 198,688,735	$ 506,829,314
Transmission Facilities	142,373,008	263,816,627	406,189,635
Subtotal	$ 450,513,587	$ 462,505,362	$ 913,018,949
Capital Improvement Program:			
Treatment Facilities	$ 108,955,650	$ 114,228,146	$ 223,183,796
Transmission Facilities	166,378,357	227,850,669	394,229,026
Total	$ 275,334,007	$ 342,078,815	$ 617,412,822
Combined Facilities:			
Treatment Facilities	$ 417,096,229	$ 312,916,881	$ 730,013,110
Transmission Facilities	308,751,365	491,667,296	800,418,661
Total	$ 725,847,594	$ 804,584,177	$ 1,530,431,771

SDF CALCULATION CREDITS

It is common practice for utilities to fund major capital improvements and expansion projects with debt (i.e., bond issues). Typically, debt service payments associated with bond issues are recovered through the monthly user rates and charges applied to all system customers, as well as from other available revenue sources (including SDFs). To mitigate the potential for new customers to pay twice for capital facilities (i.e., paying an SDF for facilities that may have been debt funded, and then paying for debt service in their monthly user rates), the SDF analysis developed herein includes a debt service credit to the existing facilities (buy-in method). The credit on the existing facilities is equal to the outstanding principal remaining on all utility related debt. The debt service credit amount for the existing facilities is allocated between water and wastewater based on information provided by staff related to the capital projects that were funded from proceeds of each individual debt instrument.

In addition to the credit on the existing facilities, the analysis developed herein applies a credit to the planned future facilities provided in the CIP (incremental cost method). The credit for the future facilities is equal to 25% of the recoverable CIP, which meets the requirements of Chapter 162A. A summary of the recoverable capital facilities as adjusted for the applicable credits is provided in **Table 5**.

TABLE 5
SUMMARY OF NET RECOVERABLE FACILITIES

Description	Net Recoverable Facilities		
	Water	Wastewater	Total
Combined Facilities:			
Treatment Facilities	$ 417,096,229	$ 312,916,881	$ 730,013,110
Transmission Facilities	308,751,365	491,667,296	800,418,661
Subtotal	$ 725,847,594	$ 804,584,177	$ 1,530,431,771
Less Combined Credits:			
Treatment Facilities	$ (115,887,189)	$ (107,895,321)	$ (223,782,510)
Transmission Facilities	(82,553,563)	(162,307,133)	(244,860,696)
Subtotal	$ (198,440,752)	$ (270,202,454)	$ (468,643,206)
Net Capital Costs:			
Treatment Facilities	$ 301,209,040	$ 205,021,560	$ 506,230,600
Transmission Facilities	226,197,802	329,360,163	555,557,965
Net Recoverable Costs	$ 527,406,842	$ 534,381,723	$ 1,061,788,565

SYSTEM CAPACITIES

As previously addressed, the purpose of the SDF is to have new customers pay for their proportionate share of system capacity. This concept implies that the fee is based on a unit cost of capacity. In order to apply a fee based on the unit cost of capacity, it is necessary to identify the capacities of the facilities for which cost recovery is assigned. As such, the methodology applied herein relies upon identifying the water and wastewater treatment capacities as well as estimating the capacities of the major transmission facilities. Due to the regulatory and design requirements for water and wastewater treatment plants, the capacity of treatment facilities is generally well documented. However, the volumetric capacity of the major transmission facilities is often more difficult to determine. For this reason, in performing an analysis of this nature, the assumed capacity of the transmission facilities is commonly based on a factor of the associated treatment capacities. In developing the estimated amount of capacity for each respective category, the analysis relies on information provided by the City and included in master planning documents, as well as assumptions based on common industry standards.

Water Treatment

The City owns and operates the Townsend Water Treatment Plant and the Mitchell Water Treatment Plant with a total design capacity of 54.00 MGD (million gallons per day). The City has also purchased 13.04 MGD of combined treatment capacity from the Piedmont Triad Regional Water Authority (PTRWA), the City of Reidsville, and the City of Burlington. In addition to the existing water treatment capacity, the CIP includes a portion of the PTRWA Randleman Dam Treatment Plant Expansion that will provide an additional 6.366 MGD of capacity. As such, the analysis developed herein utilizes a total water treatment capacity of 73.40 MGD.

While the permitted flow capacity is provided in terms of the maximum daily flow amount, the development and application of SDFs are based on average flow requirements. As such, it is necessary to convert the maximum daily flow (MDF) capacity to an estimated average daily flow (ADF) capacity. Pursuant to general industry standards and discussions with staff, it is assumed herein that the rated MDF is approximately 1.5 times the available capacity on an ADF basis. Applying this factor to the rated capacity for the water treatment plant and other water supply sources results in an average daily flow capacity of 48.93 MGD. An additional adjustment is made based on the assumed amount of unaccounted-for water (i.e., system flushing and backwashing, testing, line loss, etc.). The unaccounted-for water reduces the amount of capacity available to existing and future customers. The analysis performed herein assumes an average line-loss factor of 15.0% to adjust for the unaccounted-for water flows at the treatment plant. This final adjustment results in an assumed average daily treatment plant capacity of 41.59 MGD.

Water Transmission

Unlike the treatment facilities, the capacity information for major transmission facilities is very difficult to determine and quantify. Such transmission capacity estimates are typically not even developed in engineering documents such as master plans or Consulting Engineer's Reports. Based on discussions with staff, it is assumed that the transmission facilities are capable of providing average water flow at least equal to 2.00 times the adjusted treatment capacity, resulting in 83.18 MGD.

Wastewater Treatment

Due to the regulatory and design requirements for wastewater treatment plants, the capacity of treatment facilities is generally well documented. The wastewater treatment facilities are designed and permitted in accordance with published hydraulic standards adopted by Section 15A NCAC 02T .0114 of the North Carolina Administrative Code regulations. The City owns and operates the T.Z. Osborne Wastewater Treatment Plant with a permitted capacity of 56.00 MGD.

Unlike the application for water, due to the nature of the operations, the wastewater treatment capacity is permitted at average daily flow levels. As such, it is not necessary to convert the capacity. However, as with the unaccounted-for flows in the water system, wastewater systems are impacted by inflow and infiltration (I&I) into the wastewater collection facilities. The impact of I&I reduces the level of capacity that is available for use by existing and future system customers. The City's existing dynamic sewer collection system model was recently expanded

and updated to provide a comprehensive update of the Sanitary Sewer Master Plan. The plan, which was created in 2001, updated in 2010 and last updated in 2017, identifies sewer mains that are not adequate to convey existing and projected near-term flows and assists with prioritizing rehabilitation and replacement projects. The City's consulting engineers provided a 30% to 35% I&I range based on actual flow monitoring results. Pursuant to discussions with staff, the ADF for wastewater treatment is adjusted for an assumed I&I impact of 30.00%, resulting in an adjusted average daily capacity of 39.20 MGD.

Wastewater Transmission

Similar to the discussion provided above for the determination of water transmission capacity, it is difficult to identify the capacity of the wastewater transmission facilities. Although an exact capacity number is difficult to determine, for the purpose of this analysis it is assumed that the wastewater trunk lines and pumping facilities are designed to provide capacity at least equal to 2.00 times the permitted plant flow (as adjusted), or 78.40 MGD.

DEVELOPMENT OF SDFs

The methodology utilized herein for developing the water and wastewater SDFs relies upon the cost of major system facilities as well as the existing and expanded system capacities to calculate an estimated cost per unit (gallon) of capacity. Based on this methodology, it is estimated that the water facility costs are $9.96 per gallon of water capacity (combined treatment and transmission). Additionally, it is estimated that the wastewater facility costs are $9.43 per gallon of wastewater capacity.

In developing the SDFs, the unit costs per gallon of capacity are applied to a common Level of Service (LOS) standard in order to establish the applicable fee per Equivalent Residential Unit (ERU). For purposes of applying the LOS, an ERU is representative of a single-family residential dwelling unit receiving water service from a 5/8 x 3/4-inch metered connection and discharging normal domestic-strength wastewater through a comparably sized sewer connection. Based on common industry standards for the development and application of capacity-related charges, a typical residential water connection is generally assumed to require average service availability in the range of 350 to 450 gallons per day (gpd) of system capacity. The State of North Carolina (the "State") has established flow standards for purposes of planning and engineering design. In accordance with daily water flow capacity design standards defined in the North Carolina Administrative Codes (15A NCAC 18C .0409), the level of service requirement for a residential connection is 400 gallons per day (gpd).

The City's Water Resources Department utilizes a water distribution modeling program in part to support the capital improvement program and the development review process through the identification of system (flow and pressure) capabilities and restrictions. The City's Master Plan established average usage as 83 gallons per capita per day and a weighted average of 2.77 people per household, based on census data, resulting in 230 gpd per residential connection. As such, the

analysis developed herein utilizes the Master Plan results and assumes that 1 ERU requires a standard level of service of 230 gpd of water system capacity.

Similar to the water system, the SDFs for wastewater are to be applied on an equivalent residential unit (ERU) basis such that 1 ERU is equal to the estimated capacity requirements for a typical single family residential connection with a 5/8-inch X 3/4-inch water meter. In accordance with wastewater flow design standards adopted by the State and defined by the North Carolina Administrative Codes (15A NCAC 02T .0114), the level of service requirement is based on 120 gallons of capacity per day per bedroom for a residential home. Based on discussions with staff, for planning and design purposes for the wastewater system, the City uses a level of service assumption of 90% of the water LOS. Applying the City's LOS, it is assumed that 1 ERU requires a standard level of service of 207 gpd of wastewater system capacity.

Applying the average day LOS amounts to the estimated unit costs per gallon of capacity and adjusting for the applicable debt service credits results in the proposed water and wastewater SDFs of $2,280 and $1,940, respectively, as rounded down, for a typical single-family residential connection (i.e., per ERU). The development of the proposed water and wastewater SDFs is detailed in **Exhibits 4** and **5**, respectively. A summary of the existing and proposed SDFs for a typical new residential connection is provided in **Table 6**.

TABLE 6
COMPARISON OF FEES PER ERU

Description	Fee Per ERU Existing	Fee Per ERU Calculated
Combined Fees:		
Water	$ 980	$ 2,280
Wastewater	990	1,940
Combined Fee	**$ 1,970**	**$ 4,220**

APPLICATION OF SDFs

For the purpose of developing SDFs, the average daily flow number is established as one equivalent residential unit (ERU). An ERU provides a standard unit of measure such that fees for connections with larger than average demand requirements can be calculated on an equivalency basis. One ERU is equal to the average anticipated flow for a single-family dwelling unit with a standard 5/8 x 3/4-inch water meter. New connections with larger water meters have the potential of placing more demand on the system (i.e., require more capacity) and are assessed ERU factors accordingly. The City's existing methodology for incrementing the capacity use fees for larger connection sizes is based on standardized demand criteria established by the American Water

Works Association (AWWA) pursuant to the size of the water meter. Utilizing the AWWA demand criteria, the applicable ERU factors for larger water meters are based on the incremental increase in potential demand as compared to the standard meter size. As such, the proposed fees developed herein utilize the meter equivalency methodology currently applied by the City for its existing fees. Since wastewater flow is generally a direct function of water flow, applying the water and wastewater SDFs based upon the size of the water meter is equitable, administratively efficient and consistent with industry standards. The proposed water and wastewater SDFs for the various meter sizes are developed in **Exhibit 6** and summarized in **Table 7**.

TABLE 7
PROPOSED/CALCULATED SYSTEM DEVELOPMENT FEES

Description	Meter-Based ERU Factor	Proposed/Calculated Fees by Meter Size		
		Water	Wastewater	Combined
Meter Size:				
5/8 Inch	1.00	$ 2,280	$ 1,940	$ 4,220
3/4 Inch	1.50	$ 3,420	$ 2,910	$ 6,330
1.0 Inch	2.50	$ 5,700	$ 4,850	$ 10,550
1.5 Inch	5.00	$ 11,400	$ 9,700	$ 21,100
2.0 Inch	8.00	$ 18,240	$ 15,520	$ 33,760
3.0 Inch	16.00	$ 36,480	$ 31,040	$ 67,520
4.0 Inch	25.00	$ 57,000	$ 48,500	$ 105,500
6.0 Inch	50.00	$ 114,000	$ 97,000	$ 211,000
8.0 Inch	80.00	$ 182,400	$ 155,200	$ 337,600
10.0 Inch	115.00	$ 262,200	$ 223,100	$ 485,300

In situations where the application of the meter-based fees will result in the collection of fees significantly different than the potential demand requirement of a new customer requesting service, a special calculation methodology may be applied at the discretion of the City's Department of Water Resources. For such situations, it is important for the utility to have the flexibility to utilize an ERU methodology for individual accounts based on specific capacity requirements. This alternative methodology is to apply the calculated unit costs per gallon of capacity as provided in **Exhibit 6** times the capacity requirement for the particular customer. This type of situation will be uncommon and will typically only involve larger commercial and industrial connections. It is anticipated that, in such situations, the City will require certified engineering documentation defining the capacity utilization needs for the new customer.

As another example of utilizing a flexible methodology, the City sometimes has new master-metered multi-family connections whereby multiple residential dwelling units receive service through a single, common connection. Such connections generally consist of apartment complexes, patio homes, condominiums, duplexes, triplexes, townhouses, etc. Since the usage

characteristics for individual dwelling units within multi-family structures are generally consistent with those of individually metered single-family households, it is common industry practice for such connections to be represented on a per-unit basis regardless of the size of the master-metered connection. As such, consistent with the City's existing policies, the SDFs for new multi-family connections will be applied based on the number of permitted dwelling at a factor of 0.50 ERUs per dwelling unit. The resulting number of equivalent units is then multiplied times the SDF per ERU to calculate the total fees to be collected.

COMPARISON WITH NEIGHBORING UTILITIES

In order to provide the City with additional insight regarding the development and application of the SDFs, a comparison is often included to show the level of such fees as imposed by several other utility systems in North Carolina. The comparison would typically show the capacity-related fees for a new residential water and wastewater connection that receives service (from the subject utility or other local provider) through a standard residential-sized water meter (representative of 1 ERU) calculated under the existing and proposed fees of the City, and those of the other utility systems. A comparison of the City's existing and proposed SDF's to those currently in place for various other North Carolina utility systems (as provided by the City) is included in **Exhibit 7**. When considering the comparisons, given the 5-year timing requirements of Chapter 162A, numerous utility systems in the State are currently in the process of performing updated studies like the one addressed in this Report. However, since the updated results and potential newly adopted fees are not yet known, the neighboring utility comparison provides only the currently adopted/known fees for the other utility systems. If the City would like to better understand how its SDFs compare to those of other utility systems after the updates are completed and adopted, it is suggested that such a comparison be performed again after July 1, 2023.

GENERAL ASSUMPTIONS AND CONSIDERATIONS

In the preparation of this Report, certain information has been used and relied upon that was provided to Willdan by other entities. Such information includes, but is not limited to, audited financial statements, annual operating budgets, capital information, asset listings, cost data, system capacities, fee schedules for other utilities, and other information provided during the study. While the sources and applicable information are believed to be reliable, no independent verification of the information has been made and no assurances are offered with respect to the accuracy of the applicable information. To the extent that information used to develop the assumptions applied in the Report differs from actual results, the analyses developed herein could be impacted accordingly.

CONCLUSIONS

This study has found a need for the City to maintain a mechanism for recovering the capital costs associated with system growth and expansion. Based on the reviews, analyses and assumptions provided herein, it is concluded that:

1. The application of capital recovery fees for new system connections is becoming more common for public utility systems in North Carolina. As growth continues to impact the region, and as state and federal funding programs are reduced or eliminated, it is prudent management practice to adopt mechanisms to recover capital costs incurred by the utility for making service available to future customers.

2. Through Chapter 162A, the North Carolina legislature has found that it is prudent to require new customers to bear a portion of the costs of current capacity and future expansions their presence will demand. It should be noted that Willdan is not attempting to issue a legal opinion regarding Chapter 162A or any court proceedings leading to the enactment of Chapter 162A. The summary discussion of the bill and any prior court rulings is intended for informational purposes only. Any questions regarding the legal consideration provided herein should be directed to the City's legal counsel.

3. The SDFs developed herein are equitable and provide for reasonable recovery of the capital costs associated with providing service to new customers.

4. The SDFs proposed herein are developed in accordance with the requirements of Chapter 162A and utilize methodologies that are consistent with industry standards.

5. The proposed SDFs are based on a listing of existing system assets as provided by the City, as well as the 10-year capital improvement plan adopted by the City.

6. The water and wastewater LOS standards proposed herein for establishing an ERU are based on flow standards utilized by the City for system planning and design purposes and are consistent with common industry standards.

7. The City currently imposes meter set fees and other related operational charges for new customer connections. Since these other charges are intended to recover operating costs for providing incident-specific services, the SDFs developed herein will have no effect on the level or application methodology for these other connection-related fees.

8. The City's monthly user rates and charges for water and wastewater utility service include a surcharge for customers located outside the incorporated limits of the City. However, no such surcharge is proposed for purposes of applying the SDFs. The rationale for this proposal is that, while operating costs may increase for providing service outside of the City limits, the capital costs per gallon of capacity for

constructing major system facilities do not typically differ based on the location of the customer.

RECOMMENDATIONS

Based on the reviews, analyses and assumptions discussed herein, as well as the resulting conclusions provided above, it is respectfully recommended that the City:

1. Adopt the proposed SDFs and application methodology as developed in this Report;

2. Enact the proposed SDFs to become effective on July 1, 2023 or other such date as determined appropriate by the City Council; and

3. Readdress the SDF study within the next 5 years, or at such times as future capital budgets are developed and additional capital costs are incurred that may result in material adjustments to the SDF as adopted.

We appreciate the opportunity to be of service to the City in this matter. In addition, we would like to thank you and the other members of the City staff for the valuable assistance and cooperation provided during the preparation of the Report. We look forward to working with you on future projects and continuing a successful professional relationship.

Respectfully Yours,

WILLDAN FINANCIAL SERVICES.

Daryll B. Parker
Principal

EXHIBITS 1 - 7

SUPPORTING OUTPUT FOR THE WATER & WASTEWATER SDF STUDY

WATER & WASTEWATER SDF STUDY FOR THE CITY OF GREENSBORO, NORTH CAROLINA

Prepared by Willdan Financial Services

EXHIBIT 1
CITY OF GREENSBORO, NC
EXISTING CAPITAL COSTS RECOVERABLE FROM SYSTEM DEVELOPMENT FEES
WATER & WASTEWATER SYSTEMS

Line	Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
	UTILITY ASSETS				
	Total Assets by Category:				
1	Business-Admin	$ 30,024,199	$ 30,024,203	$ (8,332,978)	$ 21,691,225
2	Customer Service-Billing	3,963,207	3,963,206	(3,924,368)	38,838
3	Meter Shop	114,751	428,464	(409,581)	18,883
4	Water Source	28,630,326	101,771,232	(51,751,082)	50,020,150
5	Water Treatment	142,005,777	306,639,273	(143,302,181)	163,337,092
6	Booster Stations & Water Tanks	24,751,040	130,612,851	(89,241,703)	41,371,148
7	Water Lines	145,167,426	524,688,773	(390,433,162)	134,255,611
8	Sewer Lines	297,462,156	1,062,417,820	(760,522,118)	301,895,702
9	Sewer Lift Stations	65,886,868	100,464,202	(36,157,905)	64,306,297
10	Wastewater Treatment	274,989,091	672,066,500	(462,982,583)	209,083,917
11	Contributions to Other Governments	89,440,373	150,825,932	(35,890,286)	114,935,646
12	Total	$ 1,102,435,214	$ 3,083,902,456	$ (1,982,947,947)	$ 1,100,954,509
	Adjusted For Assumed Cost Limit ($):				
13	Business-Admin	$ 28,378,369	$ 28,378,368	$ (7,232,225)	$ 21,146,143
14	Customer Service-Billing	3,952,431	3,952,430	(3,913,592)	38,838
15	Meter Shop	-	-	-	-
16	Water Source	27,372,087	95,313,839	(45,731,636)	49,582,203
17	Water Treatment	136,516,945	294,085,714	(133,136,877)	160,948,837
18	Booster Stations & Water Tanks	22,473,605	120,494,499	(85,584,631)	34,909,868
19	Water Lines	103,906,321	442,521,945	(352,384,912)	90,137,033
20	Sewer Lines	214,446,813	890,343,548	(682,132,087)	208,211,461
21	Sewer Lift Stations	56,576,436	86,629,746	(31,024,580)	55,605,166
22	Wastewater Treatment	256,884,091	606,223,516	(407,534,781)	198,688,735
23	Contributions to Other Governments	89,440,373	150,825,932	(35,890,286)	114,935,646
24	Total	$ 939,947,471	$ 2,718,769,537	$ (1,784,565,607)	$ 934,203,930
	Recoverable Allocation - Water (%):				
25	Business-Admin				**0%**
26	Customer Service-Billing				**0%**
27	Meter Shop				**0%**
28	Water Source				**100%**
29	Water Treatment				**100%**
30	Booster Stations & Water Tanks				**100%**
31	Water Lines				**100%**
32	Sewer Lines				**0%**
33	Sewer Lift Stations				**0%**
34	Wastewater Treatment				**0%**
35	Contributions to Other Governments				**100%**

EXHIBIT 1
CITY OF GREENSBORO, NC
EXISTING CAPITAL COSTS RECOVERABLE FROM SYSTEM DEVELOPMENT FEES
WATER & WASTEWATER SYSTEMS

Line	Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
	Recoverable Allocation - Wastewater (%):				
36	Business-Admin				**0%**
37	Customer Service-Billing				**0%**
38	Meter Shop				**0%**
39	Water Source				**0%**
40	Water Treatment				**0%**
41	Booster Stations & Water Tanks				**0%**
42	Water Lines				**0%**
43	Sewer Lines				**100%**
44	Sewer Lift Stations				**100%**
45	Wastewater Treatment				**100%**
46	Contributions to Other Governments				**0%**
	System Allocation - Water ($):				
47	Business-Admin				$ 0
48	Customer Service-Billing				0
49	Meter Shop				0
50	Water Source				49,582,203
51	Water Treatment				160,948,837
52	Booster Stations & Water Tanks				34,909,868
53	Water Lines				90,137,033
54	Sewer Lines				0
55	Sewer Lift Stations				0
56	Wastewater Treatment				0
57	Contributions to Other Governments				114,935,646
58	Total				$ 450,513,587
	System Allocation - Wastewater ($):				
59	Business-Admin				$ 0
60	Customer Service-Billing				0
61	Meter Shop				0
62	Water Source				0
63	Water Treatment				0
64	Booster Stations & Water Tanks				0
65	Water Lines				0
66	Sewer Lines				208,211,461
67	Sewer Lift Stations				55,605,166
68	Wastewater Treatment				198,688,735
69	Contributions to Other Governments				0
70	Total				$ 462,505,362
71	**Grand Total Recoverable Assets**				**$ 913,018,949**

EXHIBIT 1
CITY OF GREENSBORO, NC
EXISTING CAPITAL COSTS RECOVERABLE FROM SYSTEM DEVELOPMENT FEES
WATER & WASTEWATER SYSTEMS

Line	Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
	COMPONENT ALLOCATION				
	Total Recoverable Water Facilities:				
72	Treatment Facilities			68.40%	$ 308,140,579
73	Transmission Facilities			31.60%	142,373,008
74	**Total**			100.00%	$ 450,513,587
	Total Recoverable Wastewater Facilities:				
75	Treatment Facilities			42.96%	$ 198,688,735
76	Transmission Facilities			57.04%	263,816,627
77	**Total**			100.00%	$ 462,505,362
	Combined Recoverable Facilities:				
78	Treatment Facilities			55.51%	$ 506,829,314
79	Transmission Facilities			44.49%	406,189,635
80	**Total**			100.00%	$ 913,018,949
	COMPARISON TO TOTAL				
81	**Total Utility Assets**				$ 1,100,954,509
82	**Combined Recoverable Assets**				$ 913,018,949
	Difference (Assets Excluded From Recovery):				
83	Excluded From Recovery ($)				$ 187,935,560
84	Excluded From Recovery (%)				17.07%
	DEBT SERVICE CREDIT				
85	**Outstanding Debt Principal**				$ 314,290,000
	Allocation Percentage:				
86	Water				41.24%
87	Wastewater				58.76%
	Allocated Debt Service Credit:				
88	Water			41.24%	$ 129,607,250
89	Wastewater			58.76%	184,682,750
90	Total			100.00%	$ 314,290,000
	Component Allocation - Water:				
91	Treatment Facilities			68.40%	$ 88,648,276
92	Transmission Facilities			31.60%	40,958,974
93	Total			100.00%	$ 129,607,250
	Component Allocation - Wastewater:				
94	Treatment Facilities			42.96%	$ 79,338,284
95	Transmission Facilities			57.04%	105,344,466
96	Total			100.00%	$ 184,682,750

Line	Description	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
	Water											
1	NCDOT Encase.	$ 4,480,500	$ 4,480,500	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
2	Airpark Ct BS	487,937	487,937	0	0	0	0	0	0	0	0	0
3	Land for Line	1,284,500	206,000	106,100	109,300	112,600	116,000	119,500	123,100	126,800	130,600	134,500
4	Up/Oversizing	12,845,000	2,060,000	1,061,000	1,093,000	1,126,000	1,160,000	1,195,000	1,231,000	1,268,000	1,306,000	1,345,000
5	Line Ext System Exp.	17,118,050	5,464,150	1,750,650	1,093,000	1,126,000	1,160,000	1,374,250	1,231,000	1,268,000	1,306,000	1,345,000
6	Pipe Bursting Imp.	39,805,566	3,795,550	3,015,362	3,344,580	3,691,028	3,859,517	4,035,608	4,219,540	4,411,562	4,611,926	4,820,893
7	Line Rehab	70,550,527	5,134,550	3,705,012	4,055,030	4,534,528	5,418,882	6,475,564	7,737,945	9,245,807	11,046,553	13,196,656
8	Line (Dig & Replace)	11,353,365	1,152,805	2,312,980	3,005,750	737,530	580,000	597,500	615,500	634,000	1,044,800	672,500
9	Asphalt Overlay.	4,945,325	793,100	408,485	420,805	433,510	446,600	460,075	473,935	488,180	502,810	517,825
10	S Elm St Imp.	295,423	295,423	0	0	0	0	0	0	0	0	0
11	Greene St. Imp.	1,951,316	1,951,316	0	0	0	0	0	0	0	0	0
12	NCDOT Y-4907B	770,519	770,519	0	0	0	0	0	0	0	0	0
13	BS - Jessup Grove Rd	1,389,137	1,389,137	0	0	0	0	0	0	0	0	0
14	Line Ext. (County) - SE	2,142,400	2,142,400	0	0	0	0	0	0	0	0	0
15	P-5709 Burlington Line	515,000	515,000	0	0	0	0	0	0	0	0	0
16	BS Standby Power Imp.	3,708,000	3,708,000	0	0	0	0	0	0	0	0	0
17	Fall Prot. WR Facilities	1,685,600	824,000	424,400	437,200	0	0	0	0	0	0	0
18	Dist. Sys. Sample St	278,100	278,100	0	0	0	0	0	0	0	0	0
19	C.Valve Repl. PJ	2,003,150	154,500	159,150	546,500	563,000	580,000	0	0	0	0	0
20	BS New Friendly Ave.	8,407,500	0	0	0	0	406,000	0	8,001,500	0	0	0
21	Pigging St PTRWA	2,961,500	309,000	2,652,500	0	0	0	0	0	0	0	0
22	Patton Ave. Line Imp.	852,725	0	175,065	677,660	0	0	0	0	0	0	0
23	Line Ext. Mitch.-Town.	1,444,300	0	318,300	0	1,126,000	0	0	0	0	0	0
24	E Greensboro Area	1,477,114	0	371,350	1,105,764	0	0	0	0	0	0	0
25	Dist. Sys. PLC Rep.	13,839,600	0	0	5,137,100	2,815,000	2,900,000	2,987,500	0	0	0	0
26	Pave. Repair WROC &	2,702,400	0	0	0	2,702,400	0	0	0	0	0	0
27	WTP PLC Rep.	14,466,400	0	0	0	5,517,400	4,408,000	4,541,000	0	0	0	0
28	Tank Repl. Mitch.	866,600	0	0	0	112,600	754,000	0	0	0	0	0
29	Line Rehab High Point	2,786,582	0	0	0	0	0	0	0	88,760	2,697,822	0
30	WS Ext. Reserve	9,639,573	1,550,823	795,750	819,750	844,500	870,000	896,250	923,250	951,000	979,500	1,008,750
31	Mitchell Electrical Imp.	1,020,061	1,020,061	0	0	0	0	0	0	0	0	0
32	Customer Service -	22,643,939	14,819,784	7,824,155	0	0	0	0	0	0	0	0
33	N Elm, Abe Brenner -	5,208,778	5,208,778	0	0	0	0	0	0	0	0	0
34	Alam Church Rd WS	4,295,431	4,295,431	0	0	0	0	0	0	0	0	0
35	Green-Rand Megasite,	16,781,786	16,781,786	0	0	0	0	0	0	0	0	0
36	Liberty Tank GRMP5	6,565,220	6,565,220	0	0	0	0	0	0	0	0	0
37	Liberty Rd Imp. Phase	23,253,321	23,253,321	0	0	0	0	0	0	0	0	0
38	Mitchell - E Contamin	9,707,750	9,707,750	0	0	0	0	0	0	0	0	0
39	BS Jessup Grove Stat	1,389,137	1,389,137	0	0	0	0	0	0	0	0	0
40	Mitch - Wste Clar / EQ	45,016,000	13,905,000	10,610,000	10,930,000	9,571,000	0	0	0	0	0	0
41	Line Ext Lees Chapel	9,425,000	4,120,000	5,305,000	0	0	0	0	0	0	0	0
42	Townsend - Lab	4,495,650	2,214,500	2,281,150	0	0	0	0	0	0	0	0
43	Townsend Clear Well	28,138,000	4,892,500	10,610,000	10,383,500	2,252,000	0	0	0	0	0	0
44	Line Ext SE	14,544,250	2,832,500	1,326,250	4,372,000	2,533,500	3,480,000	0	0	0	0	0

Line	Description	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
45	PTRWA -Plt Exp	104,460,000	3,090,000	0	32,790,000	33,780,000	34,800,000	0	0	0	0	0
46	PCCP FM Imp	11,617,600	0	3,713,500	0	337,800	522,000	3,585,000	0	443,800	2,612,000	403,500
47	Townsend Emerging	78,907,000	0	0	3,279,000	3,378,000	11,600,000	29,875,000	30,775,000	0	0	0
48	Lk Brandt Flood Gate	2,970,800	0	2,970,800	0	0	0	0	0	0	0	0
49	Mitchell - Emer	119,915,500	0	0	16,395,000	37,158,000	38,280,000	28,082,500	0	0	0	0
50	Townsend Lagoon 1	4,033,800	0	0	655,800	3,378,000	0	0	0	0	0	0
51	Ext- Mitch-Town WTP	1,444,300	0	318,300	0	1,126,000	0	0	0	0	0	0
52	Liberty Rd BS	7,067,350	0	0	163,950	450,400	0	6,453,000	0	0	0	0
53	Lakes - Air Harbor	14,218,000	0	0	0	0	2,088,000	5,975,000	6,155,000	0	0	0
54	Lake Brandt Dam Repl	37,099,000	0	0	0	0	0	0	4,924,000	15,850,000	16,325,000	0
55	**Total Water……**	$ 811,271,382	$ 151,558,578	$ 62,215,259	$ 100,814,689	$ 119,406,796	$ 113,428,999	$ 96,652,747	$ 66,410,770	$ 34,775,909	$ 42,563,011	$ 23,444,624
	Sewer											
56	Land - Line Imp	$ 1,926,750	$ 309,000	$ 159,150	$ 163,950	$ 168,900	$ 174,000	$ 179,250	$ 184,650	$ 190,200	$ 195,900	$ 201,750
57	Line Ext - *Sys Exp	11,663,750	1,545,000	795,750	819,750	844,500	2,900,000	896,250	923,250	951,000	979,500	1,008,750
58	Sewer Line Rehab	127,219,705	12,330,130	10,610,000	11,093,950	11,600,334	12,129,869	12,683,294	13,261,366	13,864,861	14,494,575	15,151,326
59	Dtown Greenway S	267,771	267,771	0	0	0	0	0	0	0	0	0
60	Kitchen Bld Soil &	5,047,102	2,266,000	530,500	437,200	450,400	464,000	478,000	421,002	0	0	0
61	TZO Primary Clarifier	1,120,949	1,120,949	0	0	0	0	0	0	0	0	0
62	PS - Reedy Fork LS	527,400	103,000	424,400	0	0	0	0	0	0	0	0
63	PS Big Alamance LS	394,100	0	0	0	394,100	0	0	0	0	0	0
64	SMP- Rayle Creek OF	2,472,000	2,472,000	0	0	0	0	0	0	0	0	0
65	Little Alamance PS	1,236,000	1,236,000	0	0	0	0	0	0	0	0	0
66	TZO Control Room	360,500	360,500	0	0	0	0	0	0	0	0	0
67	TZO - Influent pump	437,750	437,750	0	0	0	0	0	0	0	0	0
68	West Guilford Basin PJ	3,597,300	0	318,300	3,279,000	0	0	0	0	0	0	0
69	Horsepen Cr FM Repl	3,485,000	206,000	0	3,279,000	0	0	0	0	0	0	0
70	PS Horsepen Creek PS	4,566,700	0	0	0	506,700	4,060,000	0	0	0	0	0
71	SMP S of Executive	3,706,600	0	318,300	3,388,300	0	0	0	0	0	0	0
72	SMP Old Stage Coach -	5,292,700	0	0	0	0	0	478,000	123,100	4,691,600	0	0
73	Coliseum OF Upgrades	1,485,000	0	0	0	0	290,000	1,195,000	0	0	0	0
74	S Buffalo Interceptor	3,271,000	0	265,250	3,005,750	0	0	0	0	0	0	0
75	Muddy Brch OF Jolson	7,302,500	0	0	546,500	6,756,000	0	0	0	0	0	0
76	SMP Hardie - W.	1,639,500	0	0	1,639,500	0	0	0	0	0	0	0
77	SMP Pinecroft - High	611,900	0	0	0	0	0	119,500	492,400	0	0	0
78	SMP W of Boston to	2,025,750	0	0	0	0	0	179,250	1,846,500	0	0	0
79	SMP E Amidon Dr to	1,169,200	0	0	0	0	0	0	123,100	1,046,100	0	0
80	Line Rehab - High	716,400	0	0	0	0	0	0	0	63,400	653,000	0
81	SMP Gatesville to NB	4,235,000	0	0	0	0	0	0	0	317,000	3,918,000	0
82	SMP Gentry to S.	2,213,400	0	0	0	0	0	0	0	0	195,900	2,017,500
83	TZO - (BNR) Const	199,146	199,146	0	0	0	0	0	0	0	0	0
84	NCDOT Utility Ag.	41,200,000	41,200,000	0	0	0	0	0	0	0	0	0
85	Line Ext - Camp	12,204,809	12,204,809	0	0	0	0	0	0	0	0	0
86	Sandy Creek S, LS &	9,758,735	9,758,735	0	0	0	0	0	0	0	0	0
87	TZO - Influent pump	8,832,750	3,527,750	5,305,000	0	0	0	0	0	0	0	0
88	N Buffalo S OF	9,409,500	4,635,000	4,774,500	0	0	0	0	0	0	0	0

Line	Description	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
89	TZO - Primary Clarifier	8,364,000	4,120,000	4,244,000	0	0	0	0	0	0	0	0
90	TZO - Solids Hand	30,201,000	10,815,000	9,549,000	9,837,000	0	0	0	0	0	0	0
91	Brush Creek Outfall	5,776,388	2,845,375	2,931,013	0	0	0	0	0	0	0	0
92	Liberty Road LS & FM	39,816,100	721,000	19,257,150	19,837,950	0	0	0	0	0	0	0
93	Rock Creek LS Retrofit	1,267,000	206,000	1,061,000	0	0	0	0	0	0	0	0
94	TZO - 2-3.25 mwtt	6,129,500	206,000	2,917,750	3,005,750	0	0	0	0	0	0	0
95	PS Big Alamance LS	4,886,625	0	0	0	0	2,407,000	2,479,625	0	0	0	0
96	PS Birch Crk LS	3,605,000	3,605,000	0	0	0	0	0	0	0	0	0
97	Struct Repair	7,411,800	0	0	655,800	6,756,000	0	0	0	0	0	0
98	Stewart Mill Imp (H2S	3,544,250	0	265,250	3,279,000	0	0	0	0	0	0	0
99	PS Brightwood PS &	7,349,300	0	424,400	0	6,924,900	0	0	0	0	0	0
100	SMP Marstonto Saint	3,817,800	0	0	0	337,800	3,480,000	0	0	0	0	0
101	Cmp Burton OF &	21,540,000	0	10,610,000	10,930,000	0	0	0	0	0	0	0
102	TZO Exp & OF 4-8	82,782,000	0	0	4,372,000	5,630,000	0	35,850,000	36,930,000	0	0	0
103	TZO Solids Handling	15,103,000	0	0	0	0	0	358,500	1,231,000	6,657,000	6,856,500	0
104	TZO - Grit Rem	8,191,000	0	0	0	1,126,000	3,480,000	3,585,000	0	0	0	0
105	SMP Hardie to W	1,639,500	0	0	1,639,500	0	0	0	0	0	0	0
106	McKnight Mill Gravity	3,017,991	0	0	0	281,500	2,736,491	0	0	0	0	0
107	TZO Primary Clarifier	7,953,000	0	0	0	0	0	0	0	0	3,918,000	4,035,000
108	**Total Sewer……**	$ 541,991,921	$ 116,697,915	$ 74,760,713	$ 81,209,900	$ 41,777,134	$ 32,121,360	$ 58,481,669	$ 55,536,368	$ 27,781,161	$ 31,211,375	$ 22,414,326
109	**Total W & S CIP**	**$ 1,353,263,303**	**$ 268,256,493**	**$ 136,975,972**	**$ 182,024,589**	**$ 161,183,930**	**$ 145,550,359**	**$ 155,134,416**	**$ 121,947,138**	**$ 62,557,070**	**$ 73,774,386**	**$ 45,858,950**

EXHIBIT 3
CITY OF GREENSBORO, NC
ALLOCATION OF CAPITAL IMPROVEMENTS PROGRAM
WATER AND WASTEWATER SYSTEMS

Line	Description	Total	Percentage Allocation [1]			Allocation Amount		
			Expand/Upgrade	R&R	Other	Expand/Upgrade	R&R	Other
	WATER PROJECTS							
1	NCDOT Encase.	$ 4,480,500	0.00%	0.00%	100.00%	$ 0	$ 0	$ 4,480,500
2	Airpark Ct BS	487,937	100.00%	0.00%	0.00%	487,937	0	0
3	Land for Line Improvements	1,284,500	100.00%	0.00%	0.00%	1,284,500	0	0
4	Up/Oversizing	12,845,000	100.00%	0.00%	0.00%	12,845,000	0	0
5	Line Ext System Exp.	17,118,050	100.00%	0.00%	0.00%	17,118,050	0	0
6	Pipe Bursting Imp.	39,805,566	100.00%	0.00%	0.00%	39,805,566	0	0
7	Line Rehab	70,550,527	0.00%	100.00%	0.00%	0	70,550,527	0
8	Line (Dig & Replace)	11,353,365	0.00%	100.00%	0.00%	0	11,353,365	0
9	Asphalt Overlay.	4,945,325	0.00%	0.00%	100.00%	0	0	4,945,325
10	S Elm St Imp.	295,423	100.00%	0.00%	0.00%	295,423	0	0
11	Greene St. Imp.	1,951,316	100.00%	0.00%	0.00%	1,951,316	0	0
12	NCDOT Y-4907B Lowd/Pine/Mkt St RR	770,519	0.00%	100.00%	0.00%	0	770,519	0
13	BS - Jessup Grove Rd St Reloc	1,389,137	100.00%	0.00%	0.00%	1,389,137	0	0
14	Line Ext. (County) - SE Greens. FM	2,142,400	100.00%	0.00%	0.00%	2,142,400	0	0
15	P-5709 Burlington Line Reloc.	515,000	100.00%	0.00%	0.00%	515,000	0	0
16	BS Standby Power Imp.	3,708,000	0.00%	0.00%	100.00%	0	0	3,708,000
17	Fall Prot. WR Facilities	1,685,600	0.00%	0.00%	100.00%	0	0	1,685,600
18	Dist. Sys. Sample St Imp.	278,100	0.00%	0.00%	100.00%	0	0	278,100
19	C.Valve Repl. PJ	2,003,150	0.00%	100.00%	0.00%	0	2,003,150	0
20	BS New Friendly Ave. St	8,407,500	100.00%	0.00%	0.00%	8,407,500	0	0
21	Pigging St PTRWA	2,961,500	100.00%	0.00%	0.00%	2,961,500	0	0
22	Patton Ave. Line Imp.	852,725	100.00%	0.00%	0.00%	852,725	0	0
23	Line Ext. Mitch.-Town. WTP FM	1,444,300	100.00%	0.00%	0.00%	1,444,300	0	0
24	E Greensboro Area Line Repl.	1,477,114	0.00%	100.00%	0.00%	0	1,477,114	0
25	Dist. Sys. PLC Rep.	13,839,600	0.00%	100.00%	0.00%	0	13,839,600	0
26	Pave. Repair WROC & Soabar	2,702,400	0.00%	100.00%	0.00%	0	2,702,400	0
27	WTP PLC Rep.	14,466,400	0.00%	100.00%	0.00%	0	14,466,400	0
28	Tank Repl. Mitch. Filter Plt	866,600	0.00%	100.00%	0.00%	0	866,600	0
29	Line Rehab High Point /W Lee St P2	2,786,582	0.00%	100.00%	0.00%	0	2,786,582	0
30	WS Ext. Reserve	9,639,573	100.00%	0.00%	0.00%	9,639,573	0	0
31	Mitchell Electrical Imp.	1,020,061	0.00%	100.00%	0.00%	0	1,020,061	0
32	Customer Service - Water Billing Meter Changeout (39	22,643,939	0.00%	100.00%	0.00%	0	22,643,939	0
33	N Elm, Abe Brenner - Cornwallis	5,208,778	100.00%	0.00%	0.00%	5,208,778	0	0
34	Alam Church Rd WS Imp.	4,295,431	100.00%	0.00%	0.00%	4,295,431	0	0
35	Green-Rand Megasite, Ph 2, Hwy 62 FM S FM	16,781,786	0.00%	100.00%	0.00%	0	16,781,786	0
36	Liberty Tank GRMP5	6,565,220	0.00%	0.00%	100.00%	0	0	6,565,220
37	Liberty Rd Imp. Phase 2 GRMP3	23,253,321	100.00%	0.00%	0.00%	23,253,321	0	0
38	Mitchell - E Contamin Trmt Imp/GAC Design	9,707,750	0.00%	100.00%	0.00%	0	9,707,750	0
39	BS Jessup Grove Stat Reloc	1,389,137	0.00%	100.00%	0.00%	0	1,389,137	0
40	Mitch - Wste Clar / EQ Basin Imp./TracVacs/LS	45,016,000	0.00%	100.00%	0.00%	0	45,016,000	0

EXHIBIT 3
CITY OF GREENSBORO, NC
ALLOCATION OF CAPITAL IMPROVEMENTS PROGRAM
WATER AND WASTEWATER SYSTEMS

Line	Description	Total	Percentage Allocation [1]			Allocation Amount		
			Expand/Upgrade	R&R	Other	Expand/Upgrade	R&R	Other
41	Line Ext Lees Chapel P1	9,425,000	100.00%	0.00%	0.00%	9,425,000	0	0
42	Townsend - Lab Exp./Upgrades	4,495,650	100.00%	0.00%	0.00%	4,495,650	0	0
43	Townsend Clear Well	28,138,000	0.00%	100.00%	0.00%	0	28,138,000	0
44	Line Ext SE Greensboro FM Line Imp	14,544,250	100.00%	0.00%	0.00%	14,544,250	0	0
45	PTRWA -Plt Exp	104,460,000	100.00%	0.00%	0.00%	104,460,000	0	0
46	PCCP FM Imp	11,617,600	0.00%	100.00%	0.00%	0	11,617,600	0
47	Townsend Emerging Contaminants	78,907,000	0.00%	100.00%	0.00%	0	78,907,000	0
48	Lk Brandt Flood Gate Skin Mech Rehab	2,970,800	0.00%	100.00%	0.00%	0	2,970,800	0
49	Mitchell - Emer Contam Treat Imp/GAC	119,915,500	0.00%	100.00%	0.00%	0	119,915,500	0
50	Townsend Lagoon 1 Upgrade	4,033,800	0.00%	100.00%	0.00%	0	4,033,800	0
51	Ext- Mitch-Town WTP FM	1,444,300	100.00%	0.00%	0.00%	1,444,300	0	0
52	Liberty Rd BS	7,067,350	100.00%	0.00%	0.00%	7,067,350	0	0
53	Lakes - Air Harbor Reservoir Cleanout & Basin Rehab	14,218,000	0.00%	100.00%	0.00%	0	14,218,000	0
54	Lake Brandt Dam Repl	37,099,000	0.00%	100.00%	0.00%	0	37,099,000	0
55	Subtotal	$ 811,271,382				$ 275,334,007	$ 514,274,630	$ 21,662,745
	WASTEWATER PROJECTS							
56	Land - Line Imp	1,926,750	100.00%	0.00%	0.00%	1,926,750	0	0
57	Line Ext - *Sys Exp	11,663,750	100.00%	0.00%	0.00%	11,663,750	0	0
58	Sewer Line Rehab	127,219,705	0.00%	100.00%	0.00%	0	127,219,705	0
59	Dtown Greenway S Imp	267,771	100.00%	0.00%	0.00%	267,771	0	0
60	Kitchen Bld Soil & Groundwater Remed	5,047,102	0.00%	0.00%	100.00%	0	0	5,047,102
61	TZO Primary Clarifier Imp-Design	1,120,949	0.00%	100.00%	0.00%	0	1,120,949	0
62	PS - Reedy Fork LS Flood Proofing	527,400	0.00%	0.00%	100.00%	0	0	527,400
63	PS Big Alamance LS Upgrade	394,100	100.00%	0.00%	0.00%	394,100	0	0
64	SMP- Rayle Creek OF Upgrades	2,472,000	100.00%	0.00%	0.00%	2,472,000	0	0
65	Little Alamance PS	1,236,000	100.00%	0.00%	0.00%	1,236,000	0	0
66	TZO Control Room RelOC	360,500	0.00%	0.00%	100.00%	0	0	360,500
67	TZO - Influent pump repl	437,750	0.00%	100.00%	0.00%	0	437,750	0
68	West Guilford Basin PJ	3,597,300	100.00%	0.00%	0.00%	3,597,300	0	0
69	Horsepen Cr FM Repl (LS to Devonshire)- NCDOT	3,485,000	100.00%	0.00%	0.00%	3,485,000	0	0
70	PS Horsepen Creek PS	4,566,700	100.00%	0.00%	0.00%	4,566,700	0	0
71	SMP S of Executive Sq.- E 12 St	3,706,600	100.00%	0.00%	0.00%	3,706,600	0	0
72	SMP Old Stage Coach - Bledsoe Dr LS	5,292,700	100.00%	0.00%	0.00%	5,292,700	0	0
73	Coliseum OF Upgrades	1,485,000	100.00%	0.00%	0.00%	1,485,000	0	0
74	S Buffalo Interceptor Eval & Upgrade-Randleman -	3,271,000	100.00%	0.00%	0.00%	3,271,000	0	0
75	Muddy Brch OF Jolson - Drexel	7,302,500	100.00%	0.00%	0.00%	7,302,500	0	0
76	SMP Hardie - W. Meadowview	1,639,500	100.00%	0.00%	0.00%	1,639,500	0	0
77	SMP Pinecroft - High Point W. Exit Ramp off I-40	611,900	100.00%	0.00%	0.00%	611,900	0	0
78	SMP W of Boston to Gentry	2,025,750	100.00%	0.00%	0.00%	2,025,750	0	0

EXHIBIT 3
CITY OF GREENSBORO, NC
ALLOCATION OF CAPITAL IMPROVEMENTS PROGRAM
WATER AND WASTEWATER SYSTEMS

Line	Description	Total	Percentage Allocation [1]			Allocation Amount		
			Expand/Upgrade	R&R	Other	Expand/Upgrade	R&R	Other
79	SMP E Amidon Dr to NE of Grasmere Dr	1,169,200	100.00%	0.00%	0.00%	1,169,200	0	0
80	Line Rehab - High Point/ W Lee St P2	716,400	0.00%	100.00%	0.00%	0	716,400	0
81	SMP Gatesville to NB Trunkline - 16 St	4,235,000	100.00%	0.00%	0.00%	4,235,000	0	0
82	SMP Gentry to S. Holden	2,213,400	100.00%	0.00%	0.00%	2,213,400	0	0
83	TZO - (BNR) Const Admin (Old Ph IV)	199,146	100.00%	0.00%	0.00%	199,146	0	0
84	NCDOT Utility Ag. Megasite	41,200,000	100.00%	0.00%	0.00%	41,200,000	0	0
85	Line Ext - Camp Burton Sew	12,204,809	100.00%	0.00%	0.00%	12,204,809	0	0
86	Sandy Creek S, LS & FM Imp (Green/Rand Meg Ph	9,758,735	100.00%	0.00%	0.00%	9,758,735	0	0
87	TZO - Influent pump repl 2	8,832,750	0.00%	100.00%	0.00%	0	8,832,750	0
88	N Buffalo S OF Upgrade	9,409,500	100.00%	0.00%	0.00%	9,409,500	0	0
89	TZO - Primary Clarifier Imp	8,364,000	0.00%	100.00%	0.00%	0	8,364,000	0
90	TZO - Solids Hand Design Bld	30,201,000	0.00%	100.00%	0.00%	0	30,201,000	0
91	Brush Creek Outfall	5,776,388	100.00%	0.00%	0.00%	5,776,388	0	0
92	Liberty Road LS & FM	39,816,100	100.00%	0.00%	0.00%	39,816,100	0	0
93	Rock Creek LS Retrofit	1,267,000	100.00%	0.00%	0.00%	1,267,000	0	0
94	TZO - 2-3.25 mwtt genset	6,129,500	0.00%	100.00%	0.00%	0	6,129,500	0
95	PS Big Alamance LS Upgrade Cons.	4,886,625	100.00%	0.00%	0.00%	4,886,625	0	0
96	PS Birch Crk LS Aband	3,605,000	100.00%	0.00%	0.00%	3,605,000	0	0
97	Struct Repair Thickeners TZO	7,411,800	0.00%	100.00%	0.00%	0	7,411,800	0
98	Stewart Mill Imp (H2S Control and Concrete)	3,544,250	0.00%	100.00%	0.00%	0	3,544,250	0
99	PS Brightwood PS & FM	7,349,300	100.00%	0.00%	0.00%	7,349,300	0	0
100	SMP Marstonto Saint Jude	3,817,800	100.00%	0.00%	0.00%	3,817,800	0	0
101	Cmp Burton OF & Corbin LS Abandon.	21,540,000	100.00%	0.00%	0.00%	21,540,000	0	0
102	TZO Exp & OF 4-8 MGD to Reedy Fk	82,782,000	100.00%	0.00%	0.00%	82,782,000	0	0
103	TZO Solids Handling Exp.	15,103,000	100.00%	0.00%	0.00%	15,103,000	0	0
104	TZO - Grit Rem Facilities	8,191,000	100.00%	0.00%	0.00%	8,191,000	0	0
105	SMP Hardie to W Meadow.	1,639,500	100.00%	0.00%	0.00%	1,639,500	0	0
106	McKnight Mill Gravity & LS Abandon.	3,017,991	100.00%	0.00%	0.00%	3,017,991	0	0
107	TZO Primary Clarifier New Cons.	7,953,000	100.00%	0.00%	0.00%	7,953,000	0	0
108	Subtotal	$ 541,991,921				$ 342,078,815	$ 193,978,104	$ 5,935,002
109	**Total - All Capital Projects**	**$ 1,353,263,303**				**$ 617,412,822**	**$ 708,252,734**	**$ 27,597,747**

EXHIBIT 3
CITY OF GREENSBORO, NC
ALLOCATION OF CAPITAL IMPROVEMENTS PROGRAM
WATER AND WASTEWATER SYSTEMS

Line	Description	Total	Percentage Allocation (1)			Allocation Amount		
			Expand/Upgrade	R&R	Other	Expand/Upgrade	R&R	Other
	ALLOCATION OF CAPITAL PROJECTS							
	Water Summary:							
110	Treatment Projects	$ 487,958,500				$ 108,955,650	$ 379,002,850	$ 0
111	Transmission Projects	323,312,882				166,378,357	135,271,780	21,662,745
112	Other Projects	0				0	0	0
113	Subtotal	$ 811,271,382				$ 275,334,007	$ 514,274,630	$ 21,662,745
	Wastewater Summary:							
114	Treatment Projects	$ 177,086,395				$ 114,228,146	$ 62,497,749	$ 360,500
115	Transmission Projects	364,905,526				227,850,669	131,480,355	5,574,502
116	Other Projects	0				0	0	0
117	Subtotal	$ 541,991,921				$ 342,078,815	$ 193,978,104	$ 5,935,002
	Combined Summary:							
118	Treatment Projects	$ 665,044,895				$ 223,183,796	$ 441,500,599	$ 360,500
119	Transmission Projects	688,218,408				394,229,026	266,752,135	27,237,247
120	Other Projects	0				0	0	0
121	**Grand Total**	**$ 1,353,263,303**				**$ 617,412,822**	**$ 708,252,734**	**$ 27,597,747**

Notes:

(1) The capital costs are allocated in order to determine the costs that are recoverable from a capacity-related fee. The costs allocated as expansion and/or upgrade projects are assumed to be recoverable from such fees. All other capital costs are assumed to either be maintenance-related (R&R) projects or localized projects that do not provide system-wide capacity benefits.

EXHIBIT 4
CITY OF GREENSBORO, NC
CALCULATION OF SYSTEM DEVELOPMENT FEE PER ERU
WATER SYSTEM

Line	Description		Total	
	Recoverable Capital Facilities			
	Existing Facilities:			
1	Treatment Facilities		$ 308,140,579	
2	Transmission Facilities		142,373,008	
3	**Subtotal**		$ 450,513,587	(1)
	Less Debt Service Principal:			
4	Treatment Facilities		$ (88,648,276)	
5	Transmission Facilities		(40,958,974)	
6	**Subtotal**		$ (129,607,250)	(2)
	Net Recoverable Existing Facilities:			
7	Treatment Facilities		$ 219,492,303	
8	Transmission Facilities		101,414,034	
9	**Total**		$ 320,906,337	
	Capital Improvement Program:			
10	Treatment Facilities		$ 108,955,650	
11	Transmission Facilities		166,378,357	
12	**Subtotal**		$ 275,334,007	
	Less 25% CIP Adjustment:			
13	Treatment Facilities	25%	$ (27,238,913)	
14	Transmission Facilities	25%	(41,594,589)	
15	**Subtotal**		$ (68,833,502)	
	Net Recoverable CIP:			
16	Treatment Facilities		$ 81,716,737	
17	Transmission Facilities		124,783,768	
18	**Total**		$ 206,500,505	
	Net Capital Costs:			
19	Treatment Facilities		$ 301,209,040	
20	Transmission Facilities		226,197,802	
21	**Net Recoverable Costs**		**$ 527,406,842**	

EXHIBIT 4
CITY OF GREENSBORO, NC
CALCULATION OF SYSTEM DEVELOPMENT FEE PER ERU
WATER SYSTEM

Line	Description		Total	
	Available System Capacity (MGD)			
	Existing Treatment Capacity:			(3)
22	Townsend WTP		30.00	
23	Mitchell WTP		24.00	
24	Reidsville		2.00	
25	Burlington		3.20	
26	PTRWA		7.84	
27	Total Existing Treatment Capacity (MGD)		**67.04**	
	Additional CIP Capacity:			
28	Townsend WTP		0.00	
29	Mitchell WTP		0.00	
30	Reidsville		0.00	
31	Burlington		0.00	
32	PTRWA		6.36	
33	Total Additional CIP Capacity		**6.36**	
34	Total Treatment Capacity (MGD)		**73.40**	
	Average Day Capacity Adjustment:			
35	Treatment Capacity Based on Max/Avg Day Factor	1.50	48.93	
36	Unaccounted-For Water Capacity Adjustment	15.0%		
37	Adjusted Average Day Treatment Capacity		**41.59**	(4)
	Estimated Transmission System Capacity:			
38	Transmission-to-Treatment Capacity Factor	2.00		
39	Assumed Existing Transmission Capacity		**83.18**	(5)

EXHIBIT 4
CITY OF GREENSBORO, NC
CALCULATION OF SYSTEM DEVELOPMENT FEE PER ERU
WATER SYSTEM

Line	Description		Total	
	Estimated Cost Per Gallon of Capacity			
	Estimated Cost Per Gallon of Capacity:			
40	Treatment ($/Gallon)	$	7.24	
41	Transmission ($/Gallon)		2.72	
42	**Total Cost Per Gallon of Capacity**	**$**	**9.96**	
43	Assumed Standard Level of Service Per ERU (GPD of Capacity)		230	(6)
	Calculation of Proposed Fee Per ERU			
	Calculation of System Development Fee Per ERU:			
44	Treatment Facilities	$	1,665	
45	Transmission Facilities		625	
46	Combined Cost	**$**	**2,290**	
	Rounding Adjusted Fee - Treatment:			
47	Calculated Fee Per ERU	$	1,665	
48	Less Rounding Adjustment		(5)	
49	Adjusted Fee	$	1,660	
	Rounding Adjusted Fee - Transmission:			
50	Calculated Fee Per ERU	$	625	
51	Less Rounding Adjustment		(5)	
52	Adjusted Fee	$	620	
	Proposed System Development Fee Per ERU (Rounded):			
53	Treatment Facilities	$	1,660	
54	Transmission Facilities		620	
55	**Combined Cost**	**$**	**2,280**	

Line	Description	Total

Notes:

(1) See **Exhibit 1** for the development of existing asset costs identified for capital recovery.

(2) Based upon discussions with utility staff, most of the facilities included for cost recovery in this analysis were funded with debt. In an effort to account for the facility costs that may be recovered from user rates as part of the normal budgetary process, a debt service credit is applied to the applicable fee calculation. The credit is equal to outstanding principal amount on existing utility-related debt as reported in the most recent audited financial report. The principal balance is allocated between water and wastewater as provided in **Exhibit 1**.

(3) Based on rated maximum daily plant capacity information identified in the 2016 Master Plan.

(4) The estimated average daily flow capacity assumes an MDF-to-ADF ratio of 1.50 times. An additional adjustment is made for assumed unaccounted-for water flows (e.g. line losses) in the system. For the purpose of this analysis, the line-loss factor is assumed to be 15%.

(5) It is assumed that the transmission system capacity is at least equal to the maximum day treatment capacity. For the purpose of this analysis, it is assumed that the transmission capacity is 2.0 times the adjusted average daily treatment capacity.

(6) The system development fees for water are to be applied on an equivalent residential unit (ERU) basis such that 1 ERU is equal to the estimated capacity requirements for a typical single family residential connection with a 5/8-inch X 3/4-inch water meter. Based on discussions with staff, the City's recently updated Water System Master Plan shows 83 gallons per capita per day and a weighted average of 2.77 people per household, based on census data, resulting in 230 gpd per residential connection. As such, this analysis assumes that 1 ERU requires a standard level of service of 230 gpd of water system capacity in accordance with the planning levels applied by the City.

EXHIBIT 5
CITY OF GREENSBORO, NC
CALCULATION OF SYSTEM DEVELOPMENT FEE PER ERU
WASTEWATER SYSTEM

Line	Description		Total	
	Recoverable Capital Facilities			
	Existing Facilities:			
1	Treatment Facilities		$ 198,688,735	
2	Transmission Facilities		263,816,627	
3	**Subtotal**		$ 462,505,362	(1)
	Less Debt Service Principal:			
4	Treatment Facilities		$ (79,338,284)	
5	Transmission Facilities		(105,344,466)	
6	**Subtotal**		$ (184,682,750)	(2)
	Net Recoverable Existing Facilities:			
7	Treatment Facilities		$ 119,350,451	
8	Transmission Facilities		158,472,161	
9	**Total**		$ 277,822,612	
	Capital Improvement Program:			
10	Treatment Facilities		$ 114,228,146	
11	Transmission Facilities		227,850,669	
12	**Subtotal**		$ 342,078,815	
	Less 25% CIP Adjustment:			
13	Treatment Facilities	25%	$ (28,557,037)	
14	Transmission Facilities	25%	(56,962,667)	
15	**Subtotal**		$ (85,519,704)	
	Net Recoverable CIP:			
16	Treatment Facilities		$ 85,671,109	
17	Transmission Facilities		170,888,002	
18	**Total**		$ 256,559,111	
	Net Capital Costs:			
19	Treatment Facilities		$ 205,021,560	
20	Transmission Facilities		329,360,163	
21	**Net Recoverable Costs**		**$ 534,381,723**	

EXHIBIT 5
CITY OF GREENSBORO, NC
CALCULATION OF SYSTEM DEVELOPMENT FEE PER ERU
WASTEWATER SYSTEM

Line	Description		Total	
	Available System Capacity (MGD)			
	Wastewater Treatment Capacity (MGD):			
22	T.Z. Osborne		56.00	
23	Additional CIP Capacity		0.00	
24	Total Capacity of Treatment Facilities (MGD)		**56.00**	
	Treatment Capacity:			
25	Average Day Treatment Capacity (MGD)		56.00	
26	I&I Capacity Adjustment	30.0%		
27	Adjusted Average Day Treatment Capacity		**39.20**	(3)
	Estimated Transmission System Capacity:			
28	Transmission-to-Treatment Capacity Factor	2.00		
29	Assumed Existing Transmission Capacity		**78.40**	(4)
	Estimated Cost Per Gallon of Capacity			
	Estimated Cost Per Gallon of Capacity:			
30	Treatment ($/Gallon)		$ 5.23	
31	Transmission ($/Gallon)		4.20	
32	**Total Cost Per Gallon of Capacity**		**$ 9.43**	
33	Assumed Standard Level of Service Per ERU (GPD of Capacity)		207	(5)

Exhibit 5
City of Greensboro, NC
Calculation of System Development Fee Per ERU
Wastewater System

Line	Description		Total
	Calculation of Proposed Fee Per ERU		
	Calculation of System Development Fee Per ERU:		
34	Treatment Facilities	$	1,083
35	Transmission Facilities		869
36	Combined Cost	$	1,952
	Rounding Adjusted Fee - Treatment:		
37	Calculated Fee Per ERU	$	1,083
38	Less Rounding Adjustment		(3)
39	Adjusted Fee	$	1,080
	Rounding Adjusted Fee - Transmission:		
40	Calculated Fee Per ERU	$	869
41	Less Rounding Adjustment		(9)
42	Adjusted Fee	$	860
	Proposed System Development Fee Per ERU (Rounded):		
43	Treatment Facilities	$	1,080
44	Transmission Facilities		860
45	Combined Cost	**$**	**1,940**

EXHIBIT 5
CITY OF GREENSBORO, NC
CALCULATION OF SYSTEM DEVELOPMENT FEE PER ERU
WASTEWATER SYSTEM

Line	Description	Total

Notes:

(1) See **Exhibit 1** for the development of existing asset costs identified for capital recovery.

(2) Based upon discussions with utility staff, most of the facilities included for cost recovery in this analysis were funded with debt. In an effort to account for the facility costs that may be recovered from user rates as part of the normal budgetary process, a debt service credit is applied to the applicable fee calculation. The credit is equal to outstanding principal amount on existing utility-related debt as reported in the most recent audited financial report. The principal balance is allocated between water and wastewater as provided in Exhibit 1.

(3) Similar to the line loss adjustment for water, the wastewater system capacity is reduced by the impacts of system inflow and infiltration (I&I). The assumed I&I adjustment is based on discussions with staff.

(4) It is assumed that the transmission system capacity is at least equal to the maximum day treatment capacity. For the purpose of this analysis, it is assumed that the transmission capacity is 2.0 times the adjusted average daily treatment capacity.

(5) Similar to the water system, the system development fees for wastewater are to be applied on an equivalent residential unit (ERU) basis such that 1 ERU is equal to the estimated capacity requirements for a typical single family residential connection with a 5/8-inch X 3/4-inch water meter. Based on discussions with staff, the City uses a wastewater level of service of 90% of the water LOS for planning and design purposes. Therefore, it is assumed that 1 ERU requires a standard level of service of 207 gpd of wastewater system capacity.

EXHIBIT 6
CITY OF GREENSBORO, NC
SUMMARY OF PROPOSED SYSTEM DEVELOPMENT FEES
WATER & WASTEWATER

Line	Description	Meter-Based ERU Factor	Fees by System		Combined Fee
			Water	Wastewater	
	EXISTING FEES				
	Meter Size:				
1	5/8 Inch	1.00	$ 980	$ 990	$ 1,970
2	3/4 Inch	1.50	$ 1,472	$ 1,488	$ 2,960
3	1.0 Inch	2.50	$ 2,450	$ 2,480	$ 4,930
4	1.5 Inch	5.00	$ 4,900	$ 4,960	$ 9,860
5	2.0 Inch	8.00	$ 7,844	$ 7,936	$ 15,780
6	3.0 Inch	16.00	$ 15,684	$ 15,872	$ 31,556
7	4.0 Inch	25.01	$ 24,506	$ 24,800	$ 49,306
8	6.0 Inch	50.01	$ 49,012	$ 49,598	$ 98,610
9	8.0 Inch	80.02	$ 78,422	$ 79,358	$ 157,780
10	10.0 Inch	115.03	$ 112,732	$ 114,080	$ 226,812
11	Per Heated Sq Ft (Residential < 1,822 SF - based on 5/8" meter)		$ 0.53787	$ 0.54336	$ 1.08123
	PROPOSED METER BASIS (1)				
	Meter Size:				
12	5/8 Inch	1.00	$ 2,280	$ 1,940	$ 4,220
13	3/4 Inch	1.50	$ 3,420	$ 2,910	$ 6,330
14	1.0 Inch	2.50	$ 5,700	$ 4,850	$ 10,550
15	1.5 Inch	5.00	$ 11,400	$ 9,700	$ 21,100
16	2.0 Inch	8.00	$ 18,240	$ 15,520	$ 33,760
17	3.0 Inch	16.00	$ 36,480	$ 31,040	$ 67,520
18	4.0 Inch	25.00	$ 57,000	$ 48,500	$ 105,500
19	6.0 Inch	50.00	$ 114,000	$ 97,000	$ 211,000
20	8.0 Inch	80.00	$ 182,400	$ 155,200	$ 337,600
21	10.0 Inch	115.00	$ 262,200	$ 223,100	$ 485,300
22	Per Heated Sq Ft (Residential < 1,822 SF - based on 5/8" meter)		$ 1.25137	$ 1.06476	$ 2.31613
	OPTIONAL ACTUAL FLOW BASIS (2)				
	Fee Per Gallon of Capacity (GPD):				
23	Treatment Facilities		$ 7.24	$ 5.23	$ 12.47
24	Transmission Facilities		2.72	4.20	6.92
25	Cost Per GPD		$ 9.96	$ 9.43	$ 19.39

Notes:

(1) The proposed system development fees are based on the calculated fee per ERU as applied to the respective ERU factor. The proposed ERU factors for the fees are based on meter equivalency factors established by the AWWA.

(2) In situations where the application of the meter-based fees will result in the collection of fees significantly different than the potential demand requirement, a special fee calculation methodology may be applied based on the unit cost of capacity and the estimated daily capacity needs of the new service connection. The estimated capacity needs will be based on the amount determined by the utility's engineering staff to be appropriate.

EXHIBIT 7
CITY OF GREENSBORO, NC
COMPARISON WITH OTHER UTILITY SYSTEMS
WATER & WASTEWATER

Line	Description	Water	Wastewater	Combined
	City of Greensboro:			
1	Existing Fee Per ERU	$ 980	$ 990	$ 1,970
2	Proposed Fee Per ERU	$ 2,280	$ 1,940	$ 4,220
	Other Utilities - Existing Fees: (1)			
3	High Point, NC	$ 419	$ 1,077	$ 1,496
4	Burlington, NC	$ 684	$ 1,406	$ 2,090
5	Winston-Salem Forsyth, NC	$ 795	$ 2,246	$ 3,041
6	Durham, NC	$ 1,277	$ 2,022	$ 3,299
7	OWASA	$ 1,142	$ 2,391	$ 3,533
8	Charlotte Water	$ 1,000	$ 3,214	$ 4,214
9	Fuquay Varina	$ 2,000	$ 3,250	$ 5,250
10	**Average of Other Utilities**	**$ 1,045**	**$ 2,229**	**$ 3,275**

Notes:

(1) Comparison utilities and fees provided by the City.