

TUCKASEIGEE WATER & SEWER AUTHORITY BOARD MEETING MINUTES

The Tuckaseegee Water & Sewer Authority conducted a meeting on **Tuesday, April 18, 2023** at 5:00 pm in the boardroom.

Present:

Jeff Goss, Chairman	Tim Parris, Board Member
David Nestler, Board Member	Mark Jones, Board Member
Daniel Manring, Executive Director	Diane Sherrill, Attorney
Tanya Tallent, Secretary	Ron Mau, Board Member
Karen Polyasko, Treasurer	Mick McCardle, Board Member
Daryll Parker - via Zoom	Shannon Moore – via Zoom
Tiffany Rosario – via Zoom	Steven Miller – via Zoom

Absent:

Tracy Rodes, Vice-Chairperson
Mike Byers, Board Member

Staff Present:

Wanda N. Cool, Assistant Finance Director

Call to Order: Chairman Goss called the meeting to order at 5:03 p.m.

Ethics Statement: Read by Chairman Goss.

Public Comment: None

Approval of Minutes: *Mark Jones made a motion to approve the minutes from March 21, 2023. Tim Parris seconded the motion. Upon unanimous vote, the motion carried.*

Agenda Additions or Deletions: *Ron Mau made a motion to approve the agenda as presented. Mick McCardle seconded the motion. Upon unanimous vote, the motion carried.*

AGENDA ITEM #1:**System Development Fee Study and Water & Sewer Rate Study Presentation**

Daryll Parker of Willdan Financial Services presented the System Development Fee Study and the Water & Sewer Rate Study to the Board (via Zoom). The presentation focused on the draft report of the System Development Fee (SDF) Study that had been performed in accordance with North Carolina House Bill 436. Hard copies of the draft report were available for viewing at the TWSA main office and also posted on the TWSA website. The related Public Hearing is scheduled for May 9th at 5:00 p.m. prior to the May Work Session.

Daryll also discussed the concurrent Water & Sewer Rate Study that Willdan Financial Services has performed. Daryll and the staff at both Willdan Financial Services and WithersRavenel have worked with TWSA staff over the last few months on both of these studies. Action will be requested at the next Business Meeting to approve the System Development Fee Study.

There was no action taken.

*See attached item(s):
2023 TWSA SDF Study - Draft*

AGENDA ITEM #2:**FY 2023-24 Proposed Budget**

Daniel Manring explained to the Board that TWSA Staff and the Finance Committee have made a lot of progress on the proposed budget for FY 2023-24. The purposes of this agenda item was to discuss the proposed budget and summarize some of the proposed changes for the upcoming year. Daniel Manring stated the budget would be posted to meet the statutory requirements of having the draft available to the public prior to TWSA's Public Hearing, scheduled before the next Business Meeting on Tuesday, May 23, 2023 at 5:00 p.m.

There was no action taken.

Organizational Updates

Organizational Updates: The topics listed below were discussed during the Organizational Update:

1. COVID-19 Related:

- a. Wastewater Testing

2. Current In-Progress Project Briefing:

- a. Jackson Paper Lift Station/Dollar Store Lift Station
- b. Cowan Valley Water Consolidation
- c. Horsepasture WWTP
- d. WWTP #2 Improvements
- e. NCDOT 107 Project R-5600
- f. NCDOT Skyland Drive Sidewalk Project
- g. NCDOT Monteith Gap Bridge Project
- h. Sludge Study
- i. Dillsboro Water Extension
- j. Community Outreach

3. Financial Overview

- a. Financial Information

Ron Mau made a motion to adjourn. The meeting adjourned at 7:26 p.m.

**These minutes were approved at the following Business Meeting held on Tuesday, May 23, 2023.*

March 10, 2023

Daniel Manring, Executive Director
Tuckaseegee Water & Sewer Authority
1246 West Main Street
Sylva, NC 28779

DRAFT 3

Subject: Water and Wastewater System Development Fee Study

Dear Mr. Manring,

WILLDAN FINANCIAL SERVICES (“Willdan”) is pleased to submit to Tuckaseegee Water and Sewer Authority (the "Authority") 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 various 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 include the construction of facilities as well as engineering, surveys, land, financing, legal and administrative costs. It has become customary practice for water and wastewater utility systems to implement SDF (or other similar charges) 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. 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 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 purpose (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

Courts throughout the United States have found that capacity-related fees associated with new customer connections to utility systems are legal provided they meet a Rational Nexus Test. In accordance with common court rulings, the rational nexus test requires that certain conditions be met to incorporate 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 by reason 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.
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 distinct factors influencing this decision, the result generated a significant amount of confusion and concern for governmental utility systems within the State.

House Bill 436

The General Assembly of North Carolina recently 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 5 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 SDFs that meet the legal requirements set forth above to develop fees in accordance with Chapter 162A. The development of the proposed/calculated SDFs and applicable analysis assumptions are described throughout the remainder of the Report.

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 potential 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 Authority currently imposes SDFs to new customers requiring water and/or wastewater utility service. The current Northern System fees are \$675 and \$777 per equivalent residential unit (ERU), for water and wastewater, respectively, while the current Southern Sewer System fee is \$1,553 per ERU. The fees are based on Instantaneous Peak Flow (IPF) as expressed in Gallons Per Minute (GPM). Based on the Authority's adopted methodology, one ERU is equal to 20 gallons of water flow per minute. The existing SDFs are provided in **Table 1**.

TABLE 1
EXISTING SYSTEM DEVELOPMENT FEES

Peak Flow GPM	SDF Category	Northern System		Southern Sewer
		Water	Sewer	
7-10	A	\$ 450	\$ 518	\$ 1,035
20	B	\$ 675	\$ 777	\$ 1,553
25	C	\$ 844	\$ 985	\$ 1,969
30	D	\$ 1,013	\$ 1,182	\$ 2,363
40	E	\$ 1,323	\$ 1,566	\$ 3,132
50	F	\$ 1,654	\$ 1,958	\$ 3,915
78	G	\$ 2,600	\$ 3,044	\$ 6,088
106	H	\$ 3,533	\$ 4,137	\$ 8,274
134	I	\$ 8,933	\$ 10,459	\$ 10,459
160	J	\$ 10,665	\$ 12,488	\$ 12,488
195	K	\$ 12,987	\$ 15,224	\$ 15,224
230	L	\$ 15,318	\$ 17,957	\$ 17,957
265	M	\$ 17,649	\$ 20,690	\$ 20,690
300	N	\$ 19,980	\$ 23,423	\$ 23,423
350	O	\$ 23,342	\$ 27,358	\$ 27,358
400	P	\$ 26,676	\$ 31,266	\$ 31,266
450	Q	\$ 30,011	\$ 35,174	\$ 35,174
500	R	\$ 33,345	\$ 39,083	\$ 39,083
625	S	\$ 41,682	\$ 48,854	\$ 48,854
750	T	\$ 50,018	\$ 58,624	\$ 58,624
875	U	\$ 58,354	\$ 68,395	\$ 68,395
1000	V	\$ 66,690	\$ 78,165	\$ 78,165
1200	W	\$ 79,988	\$ 93,758	\$ 93,758
1400	X	\$ 93,319	\$ 109,384	\$ 109,384
1600	Y	\$ 106,650	\$ 125,010	\$ 125,010
1600+	Z	Calculated	Calculated	Calculated

EXISTING TAP FEES

The Authority currently imposes tap fees to new customers connecting to the water and wastewater systems. However, it is important to note that such connection-related (tap) fees are different than the SDFs developed and proposed herein. The distinguishing characteristic is that the tap fees are established for the purpose of recovering the operating costs associated with performing the customer service act of physically making a new system connection (i.e., materials, 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 public. The SDFs calculated herein are intended to be in addition to the tap fees. As such, it is proposed that the existing tap fees continue to be imposed. It should be noted that, for the purpose of this Report, the existing connection 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 using 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 Authority 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 diverse types of utility construction, including water systems. Since much of the construction material and equipment is similar, the index is commonly applied to wastewater systems as well. 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 other construction cost indices are available, 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. Based on discussions with staff, the Northern System provides water service for all of the existing and new water customers. However, for wastewater the Northern Sewer System and Southern Sewer System are two separate operating facilities providing service within designated areas. As such, the asset data is separated into Northern System and Southern Sewer System. The existing capital facilities and RCNLD calculations are summarized in **Tables 2** and **3**, for the Northern and Southern Systems, respectively.

TABLE 2 - NORTHERN SYSTEM RCNLD OF EXISTING SYSTEM ASSETS				
Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
<u>Total Utility Assets:</u>				
Computer Equipment	\$ 1,197,172	\$ 1,197,172	\$ (624,921)	\$ 572,251
Equipment	801,717	843,664	(569,253)	274,411
Furniture & Fixtures	193,323	193,323	(131,256)	62,067
Land	788,074	788,074	0	788,074
Office Building	797,234	797,234	(426,936)	370,298
Plant & Distribution Systems	51,727,593	106,022,979	(54,660,366)	51,362,613
Vehicles	495,171	495,171	(436,427)	58,744
Total	\$ 56,000,284	\$ 110,337,617	\$ (56,849,159)	\$ 53,488,458

**TABLE 3 - SOUTHERN SEWER SYSTEM
 RCNLD OF EXISTING SYSTEM ASSETS**

Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
Total Utility Assets:				
Computer Equipment	\$ 0	\$ 0	\$ 0	\$ 0
Equipment	9,394	23,535	(23,535)	0
Furniture & Fixtures	0	0	0	0
Land	857,689	857,689	0	857,689
Office Building	0	0	0	0
Plant & Distribution Systems	2,725,415	5,736,095	(3,416,284)	2,319,811
Vehicles	21,248	21,248	(21,248)	0
Total	\$ 3,613,746	\$ 6,638,567	\$ (3,461,067)	\$ 3,177,500

As provision for SDF analyses, the existing assets are categorized based on the major components of **Treatment** and **Transmission**. The treatment category includes any treatment plant facilities (water and/or 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 oftentimes 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 is set as a condition of inclusion of the asset items in the SDF calculation. Based on discussions with Authority staff, for the purposes of this analysis, the cost is set at \$100,000. The cost limit assumes 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 (e.g., equipment, vehicles, etc.) The existing recoverable water and wastewater capital asset cost allocations included in the analyses are summarized in **Tables 4** and **5**. The asset data and applicable recoverable cost allocations are detailed in **Exhibits 1** and **2** for the Northern and Southern Systems, respectively, at the end of this Report.

**TABLE 4 - NORTHERN SYSTEM
ALLOCATION OF EXISTING RECOVERABLE FACILITIES**

Description	RCNLD Included for Recovery		
	Water	Wastewater	Total
<u>Total Recoverable Assets:</u>			
Computer Equipment	\$ 0	\$ 0	\$ 0
Equipment	0	0	0
Furniture & Fixtures	0	0	0
Land	161,875	264,494	426,369
Office Building	129,709	129,709	259,418
Plant & Distribution Systems	16,751,817	28,979,858	45,731,675
Vehicles	0	0	0
Total	\$ 17,043,401	\$ 29,374,061	\$ 46,417,462
<u>Allocation of Recoverable Assets:</u>			
Treatment Facilities	\$ 6,918,361	\$ 20,393,137	\$ 27,311,498
Transmission Facilities	10,125,040	8,980,924	19,105,964
Total	\$ 17,043,401	\$ 29,374,061	\$ 46,417,462

**TABLE 5 - SOUTHERN SEWER SYSTEM
ALLOCATION OF EXISTING RECOVERABLE FACILITIES**

Description	RCNLD Included for Recovery
<u>Total Recoverable Assets:</u>	
Computer Equipment	\$ 0
Equipment	0
Furniture & Fixtures	0
Land	815,289
Office Building	0
Plant & Distribution Systems	2,057,316
Vehicles	0
Total	\$ 2,872,605
<u>Allocation of Recoverable Assets:</u>	
Treatment Facilities	\$ 1,720,091
Transmission Facilities	1,152,514
Total	\$ 2,872,605

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 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 Authority has adopted a CIP that provides a listing of individual projects and anticipated construction costs for the 10 fiscal years from 2023 through 2032. The projected capital costs are provided in 2023 dollars. Based on input from staff, the starting CIP amounts have been adjusted to reflect more recent construction costs. In addition, the analysis developed herein applies an annual inflationary adjustment of 5.00% to capture the impact of assumed future cost increases. The adjusted CIP is provided in **Exhibit 3**. Like 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 4**. 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 6** and **7**.

**TABLE 6 - NORTHERN SYSTEM
 SUMMARY OF THE CIP & RECOVERABLE CAPITAL COSTS**

Description	Total CIP	Excluded Capital	Recoverable Capital
Water:			
Treatment Facilities	\$ 16,790,664	\$ (46,200)	\$ 16,744,464
Transmission Facilities	6,312,996	(3,831,128)	2,481,868
Other Facilities	36,750	(36,750)	0
Total	\$ 23,140,410	\$ (3,914,078)	\$ 19,226,332
Wastewater:			
Treatment Facilities	\$ 8,718,035	\$ (88,200)	\$ 8,629,835
Transmission Facilities	8,901,376	(6,323,924)	2,577,452
Other Facilities	36,750	(36,750)	0
Total	\$ 17,656,161	\$ (6,448,874)	\$ 11,207,287
Combined:			
Treatment Facilities	\$ 25,508,699	\$ (134,400)	\$ 25,374,299
Transmission Facilities	15,214,372	(10,155,052)	5,059,320
Other Facilities	73,500	(73,500)	0
Total	\$ 40,796,571	\$ (10,362,952)	\$ 30,433,619

**TABLE 7 - SOUTHERN SEWER SYSTEM
 SUMMARY OF THE CIP & RECOVERABLE CAPITAL COSTS**

Description	Total CIP	Excluded Capital	Recoverable Capital
Wastewater:			
Treatment Facilities	\$ 17,879,283	\$ (1,868,338)	\$ 16,010,945
Transmission Facilities	7,197,703	(2,035,215)	5,162,488
Other Facilities	0	0	0
Total	\$ 25,076,986	\$ (3,903,553)	\$ 21,173,433

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 service or increase capacity. This method assumes that the utility has capacity within the existing system sufficient

to serve near-term growth but will require additional capacity to meet 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 for the Northern System included for recovery are summarized in **Table 8** and the Southern System recoverable facilities are displayed in **Table 9**.

TABLE 8 - NORTHERN SYSTEM SUMMARY OF COMBINED RECOVERABLE FACILITIES			
Description	Recoverable Facilities		
	Water	Wastewater	Total
Existing Facilities:			
Treatment Facilities	\$ 6,918,361	\$ 20,393,137	\$ 27,311,498
Transmission Facilities	10,125,040	8,980,924	19,105,964
Subtotal	\$ 17,043,401	\$ 29,374,061	\$ 46,417,462
Capital Improvement Program:			
Treatment Facilities	\$ 16,744,464	\$ 8,629,835	\$ 25,374,299
Transmission Facilities	2,481,868	2,577,452	5,059,320
Subtotal	\$ 19,226,332	\$ 11,207,287	\$ 30,433,619
Combined Recoverable Costs:			
Treatment Facilities	\$ 23,662,825	\$ 29,022,972	\$ 52,685,797
Transmission Facilities	12,606,908	11,558,376	24,165,284
Total	\$ 36,269,733	\$ 40,581,348	\$ 76,851,081

**TABLE 9 - SOUTHERN SEWER SYSTEM
SUMMARY OF COMBINED RECOVERABLE FACILITIES**

Description	Recoverable Facilities
Existing Facilities:	
Treatment Facilities	\$ 1,720,091
Transmission Facilities	1,152,514
Subtotal	\$ 2,872,605
Capital Improvement Program:	
Treatment Facilities	\$ 16,010,945
Transmission Facilities	5,162,488
Subtotal	\$ 21,173,433
Combined Recoverable Costs:	
Treatment Facilities	\$ 17,731,036
Transmission Facilities	6,315,002
	\$ 24,046,038

**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 10** for the Northern System and **Table 11** for the Southern System.

**TABLE 10 - NORTHERN SYSTEM
SUMMARY OF NET RECOVERABLE FACILITIES**

Description	Net Recoverable Facilities		
	Water	Wastewater	Total
Combined Recoverable Costs:			
Treatment Facilities	\$ 23,662,825	\$ 29,022,972	\$ 52,685,797
Transmission Facilities	12,606,908	11,558,376	24,165,284
Subtotal	\$ 36,269,733	\$ 40,581,348	\$ 76,851,081
Less Combined Credits:			
Treatment Facilities	\$ (4,617,736)	\$ (9,133,627)	\$ (13,751,363)
Transmission Facilities	(1,252,143)	(3,716,595)	(4,968,738)
Subtotal	\$ (5,869,879)	\$ (12,850,222)	\$ (18,720,101)
Net Capital Costs:			
Treatment Facilities	\$ 19,045,089	\$ 19,889,345	\$ 38,934,434
Transmission Facilities	11,354,765	7,841,781	19,196,546
Net Recoverable Costs	\$ 30,399,854	\$ 27,731,126	\$ 58,130,980

**TABLE 11 - SOUTHERN SEWER SYSTEM
SUMMARY OF NET RECOVERABLE FACILITIES**

Description	Net Recoverable Facilities
Combined Recoverable Costs:	
Treatment Facilities	\$ 17,731,036
Transmission Facilities	6,315,002
Subtotal	\$ 24,046,038
Less Combined Credits:	
Treatment Facilities	\$ (4,002,736)
Transmission Facilities	(1,290,622)
Subtotal	\$ (5,293,358)
Net Capital Costs:	
Treatment Facilities	\$ 13,728,300
Transmission Facilities	5,024,380
Net Recoverable Costs	\$ 18,752,680

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. 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 typically 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 Authority, as well as assumptions based on common industry standards.

Water Treatment

The Authority currently owns and operates the Tuckaseegee Water Treatment Plant, which has a treatment capacity of 1.50 MGD (million gallons per day). In addition to the existing water treatment capacity, the CIP includes a Water Treatment Plant Expansion that will provide additional system capacity. Based on discussions with staff, the expansion will add 1.25 MGD. As such, the analysis developed herein utilizes a total water treatment capacity of 2.75 MGD.

While the 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. In accordance with general industry standards and discussions with staff, it is assumed herein that the rated MDF is approximately 1.50 times the available capacity on an ADF basis. Applying this factor to the rated capacity for the water treatment facilities results in an average daily flow capacity of 1.833 MGD. An additional adjustment is made based for 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. Based on discussions with staff, the analysis performed herein assumes an average loss factor of 10.0% to adjust for the unaccounted-for water flows. This final adjustment results in an assumed average daily treatment plant capacity of 1.650 MGD (see **Exhibit 5**).

Water Transmission

Unlike treatment facilities, the capacity information for major transmission facilities is extremely 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 existing transmission facilities can provide

water flow at least equal to 2.00 times the existing max-day treatment capacity, resulting in 5.50 MGD. Like the adjustment for treatment, a 10.0% loss adjustment is made to the transmission facilities resulting in a combined adjusted capacity of 4.95 MGD (see **Exhibit 5**).

Wastewater Treatment - Northern System

Due to the regulatory and design requirements for wastewater treatment plants, the capacity of treatment facilities is frequently 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 Authority owns and operates the Northern System Wastewater Treatment Plant #1 with a permitted capacity of 3.50 MGD, the Northern System Wastewater Treatment Plant #2 with a permitted capacity of 0.50 MGD, and the Whittier Wastewater Treatment Plant #4 with a permitted capacity of 0.20 MGD. As such, the Authority has 4.20 MGD of combined wastewater treatment capacity.

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. Pursuant to discussions with staff, the combined wastewater treatment capacity is adjusted for an assumed I&I impact of 20.0%, resulting in an adjusted average daily treatment capacity of 3.36 MGD (see **Exhibit 6**).

Wastewater Transmission - Northern System

Like 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 challenging 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, or 8.40 MGD. Like the adjustment for treatment, a 20.0% I&I adjustment is made to the transmission facilities resulting in a combined adjusted capacity of 6.72 MGD (see **Exhibit 6**).

Wastewater Treatment - Southern System

The Authority also owns and operates the Southern System Wastewater Treatment Plant #3 with a permitted capacity of 0.20 MGD. In addition to the existing wastewater treatment capacity, the CIP includes the Horsepasture River Wastewater Treatment Plant that will provide additional system capacity. Based on discussions with staff, the treatment plant will add 0.125 MGD. As such, the analysis developed herein utilizes a total wastewater treatment capacity of 0.325 MGD.

Pursuant to discussions with staff, the combined Southern System wastewater treatment capacity is adjusted for an assumed I&I impact of 10.0%, resulting in an adjusted average daily treatment capacity of 0.293 MGD (see **Exhibit 7**).

Wastewater Transmission - Southern System

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 3.00 times the permitted plant flow, or 0.975 MGD. Like the adjustment for treatment, a 10.0% I&I adjustment is made to the transmission facilities resulting in a combined adjusted capacity of 0.878 MGD (see **Exhibit 7**).

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 \$13.83 per gallon of water capacity (combined treatment and transmission). It is estimated that the Northern wastewater facility costs are \$7.09 per gallon of wastewater capacity. Additionally, the estimated Southern wastewater facility costs are \$52.57 per gallon of capacity.

In developing the SDFs, the unit costs per gallon of capacity are applied to a common Level of Service (LOS) standard 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 widely 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 gpd. Although the State codes are unclear as to whether 400 gpd is intended to be a max-day amount or an average-day amount, for the purpose of this analysis, it is assumed to be a max-day flow amount. Applying the assumed Max/Avg Day Adjustment Factor to the NCAC flow standard, it is assumed that 1 ERU requires a standard level of service of 267 gpd of water system capacity.

Like the water system, the SDFs for wastewater are to be applied on an 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 (with a minimum of 240 gpd) for a residential home. Based on discussions with staff, the analysis developed herein assumes that the standard for the Authority is three bedrooms. The resulting standard LOS is 360 gpd of wastewater system capacity per ERU.

Applying the average day LOS amounts to the estimated unit costs per gallon of capacity results in the proposed/calculated Northern System water and wastewater SDFs of \$3,690 and \$2,550, respectively, for a typical single-family residential connection (i.e., per ERU). The development of the water and wastewater SDFs are detailed in **Exhibits 5** and **6**, respectively. A summary of the existing and proposed/calculated SDFs for a new residential connection is provided in **Table 12**.

TABLE 12 - NORTHERN SYSTEM COMPARISON OF SDFs PER ERU				
Description	System Development Fee Per ERU			
	Existing	Calculated	Difference	
System Development Fees:				
Water	\$ 675	\$ 3,690	\$ 3,015	
Wastewater	777	2,550	1,773	
Total	\$ 1,452	\$ 6,240	\$ 4,788	

Applying the same methodology discussed above, the proposed/calculated Southern System wastewater SDF is \$18,910 per ERU. The calculation of the Southern wastewater SDFs are detailed in **Exhibit 7**. A summary of the existing and proposed/calculated SDFs for a new residential connection is provided in **Table 13**.

TABLE 13 - SOUTHERN SEWER SYSTEM COMPARISON OF SDFs PER ERU				
Description	System Development Fee Per ERU			
	Existing	Calculated	Difference	
System Development Fee:				
Wastewater	\$ 1,553	18,910	\$ 17,357	

	APPLICATION OF SDFs
--	----------------------------

As previously addressed, the Authority currently imposes SDFs to new connections based on IPF expressed in GPM. One ERU is equal to 20 gallons per minute of water flow capacity. New connections placing more demand on the system are assessed equivalency factors accordingly. The proposed/calculated Northern System water and wastewater SDFs for the various flow demands are developed in **Exhibit 8**, the Southern System in **Exhibit 9** and summarized in **Tables 14** and **15**.

**TABLE 14 - NORTHERN SYSTEM
PROPOSED SYSTEM DEVELOPMENT FEES**

Peak Flow GPM	SDF Category	Proposed Fees By GPM		
		Water	Wastewater	Total
10	(1) A	\$ 2,472	\$ 1,709	\$ 4,181
20	B	\$ 3,690	\$ 2,550	\$ 6,240
25	C	\$ 4,613	\$ 3,188	\$ 7,800
30	D	\$ 5,535	\$ 3,825	\$ 9,360
40	E	\$ 7,380	\$ 5,100	\$ 12,480
50	F	\$ 9,225	\$ 6,375	\$ 15,600
78	G	\$ 14,391	\$ 9,945	\$ 24,336
106	H	\$ 19,557	\$ 13,515	\$ 33,072
134	I	\$ 24,723	\$ 17,085	\$ 41,808
160	J	\$ 29,520	\$ 20,400	\$ 49,920
195	K	\$ 35,978	\$ 24,863	\$ 60,840
230	L	\$ 42,435	\$ 29,325	\$ 71,760
265	M	\$ 48,893	\$ 33,788	\$ 82,680
300	N	\$ 55,350	\$ 38,250	\$ 93,600
350	O	\$ 64,575	\$ 44,625	\$ 109,200
400	P	\$ 73,800	\$ 51,000	\$ 124,800
450	Q	\$ 83,025	\$ 57,375	\$ 140,400
500	R	\$ 92,250	\$ 63,750	\$ 156,000
625	S	\$ 115,313	\$ 79,688	\$ 195,000
750	T	\$ 138,375	\$ 95,625	\$ 234,000
875	U	\$ 161,438	\$ 111,563	\$ 273,000
1000	V	\$ 184,500	\$ 127,500	\$ 312,000
1200	W	\$ 221,400	\$ 153,000	\$ 374,400
1400	X	\$ 258,300	\$ 178,500	\$ 436,800
1600	Y	\$ 295,200	\$ 204,000	\$ 499,200
1600+	Z	Calculated	Calculated	Calculated

(1) The Proposed/Calculated fee for Category A assumes the fee will be applied to all new customers with a maximum peak flow of 10 gpm and below.

**TABLE 15 - SOUTHERN SEWER SYSTEM
 PROPOSED SYSTEM DEVELOPMENT FEES**

Peak Flow GPM	SDF Category	Proposed Fees By GPM Southern Sewer
10	(1) A	\$ 12,670
20	B	\$ 18,910
25	C	\$ 23,638
30	D	\$ 28,365
40	E	\$ 37,820
50	F	\$ 47,275
78	G	\$ 73,749
106	H	\$ 100,223
134	I	\$ 126,697
160	J	\$ 151,280
195	K	\$ 184,373
230	L	\$ 217,465
265	M	\$ 250,558
300	N	\$ 283,650
350	O	\$ 330,925
400	P	\$ 378,200
450	Q	\$ 425,475
500	R	\$ 472,750
625	S	\$ 590,938
750	T	\$ 709,125
875	U	\$ 827,313
1000	V	\$ 945,500
1200	W	\$ 1,134,600
1400	X	\$ 1,323,700
1600	Y	\$ 1,512,800
1600+	Z	Calculated

(1) The Proposed/Calculated fee for Category A assumes the fee will be applied to all new customers with a maximum peak flow of 10 gpm and below.

Although the current methodology of applying the fees is reasonable and equitable, it is also somewhat cumbersome. As such, it is suggested that the Authority consider a more administratively efficient fee structure. It is common practice in the utility industry to charge capacity-related fees based upon the size of the water meter. The concept is that the meter size is directly correlated to the potential demand a customer can place on the system. With a meter-based fee structure, 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 methodology for incrementing the fees for larger connection sizes is based on standardized demand criteria established by the American Water Works Association (AWWA) and the Water Environment Federation (WEF) pursuant to the size of the water meter. Utilizing the AWWA/WEF 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. If the Authority chooses to go this direction, the meter-based fees displayed below utilize the AWWA/WEF meter equivalency methodology. 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 applicable meter-based fees are summarized in **Tables 16** and **17**, for the Northern and Southern Systems, respectively.

**TABLE 16 - NORTHERN SYSTEM
 METER - BASED SYSTEM DEVELOPMENT FEES**

Description	Meter Factor ⁽¹⁾	Proposed Fees By Meter Size		
		Water	Wastewater	Total
Meter Size:				
5/8 & 3/4 Inch	1.00	\$ 3,690	\$ 2,550	\$ 6,240
1.0 Inch	1.50	\$ 5,535	\$ 3,825	\$ 9,360
1.5 Inch	2.50	\$ 9,225	\$ 6,375	\$ 15,600
2.0 Inch	5.00	\$ 18,450	\$ 12,750	\$ 31,200
3.0 Inch	8.00	\$ 29,520	\$ 20,400	\$ 49,920
4.0 Inch	15.00	\$ 55,350	\$ 38,250	\$ 93,600
6.0 Inch	25.00	\$ 92,250	\$ 63,750	\$ 156,000
8.0 Inch	50.00	\$ 184,500	\$ 127,500	\$ 312,000
10.0 Inch	80.00	\$ 295,200	\$ 204,000	\$ 499,200

(1) Meter-size equivalency factors established by the AWWA and identified in AWWA Standards C700, M1 and M22. Such factors are commonly applied consistently for both water and wastewater fee calculations.

**TABLE 17 - SOUTHERN SEWER SYSTEM
 METER - BASED SYSTEM DEVELOPMENT FEES**

Description	Meter Factor ⁽¹⁾	Proposed Fees By Meter Size	
Meter Size:			
5/8 & 3/4 Inch	1.00	\$	18,910
1.0 Inch	1.50	\$	28,365
1.5 Inch	2.50	\$	47,275
2.0 Inch	5.00	\$	94,550
3.0 Inch	8.00	\$	151,280
4.0 Inch	15.00	\$	283,650
6.0 Inch	25.00	\$	472,750
8.0 Inch	50.00	\$	945,500
10.0 Inch	80.00	\$	1,512,800
(1) Meter-size equivalency factors established by the AWWA and identified in AWWA Standards C700, M1 and M22. Such factors are commonly applied consistently for both water and wastewater fee calculations.			

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 Authority's Utility Department. 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 5, 6, and 7** times the capacity requirement for the 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 Authority will require certified engineering documentation defining the capacity utilization needs for the new customer.

COMPARISON WITH NEIGHBORING UTILITIES

To provide the Authority 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 Authority, and those of the other utility systems. However, given the current timing requirements of Chapter 162A, and the fact that numerous utility systems in the State are in the process of performing updated fee studies comparable to those addressed in this Report, including a neighboring utility comparison at this time will provide somewhat meaningless information. If the Authority would like to get a better idea of how its SDFs compare to other systems, it is suggested that such a comparison be performed 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 Authority 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 Authority'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 developed herein are calculated in accordance with the requirements of Chapter 162A and utilize methodologies that are consistent with industry standards.
5. The calculated SDFs are based on a listing of existing system assets as provided by the Authority, as well as the multi-year capital improvement plan adopted by the Authority.
6. The water and wastewater LOS standards proposed herein for establishing an ERU basis are based on flow standards approved by the State of North Carolina and utilized by the Authority for system planning and design purposes and are consistent with common industry standards.
7. The Authority currently imposes tap 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 impact on the level or application methodology for these other connection-related fees.

RECOMMENDATIONS

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

1. Adopt the calculated SDFs and application methodology as developed in this Report, or other such SDF amounts as determined appropriate by the Authority but not to exceed the fee amounts calculated herein;
2. Enact the new SDFs to become effective on July 1, 2023 or other such date as determined appropriate by the Authority Board; 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 Authority in this matter. In addition, we would like to thank you and the other members of the Authority staff for the valuable assistance and cooperation provided during the preparation of the Report. We look forward to collaborating with you on future projects and continuing a successful professional relationship.

Respectfully Yours,

WILLDAN FINANCIAL SERVICES.



Daryll B. Parker
Principal Consultant

EXHIBITS 1 - 9

SUPPORTING OUTPUT FOR THE WATER & WASTEWATER SDF STUDY



TUCKASEGEE
Water & Sewer Authority
SERVING JACKSON COUNTY

**WATER & WASTEWATER SDF STUDY FOR
TUCKASEGEE WATER & SEWER AUTHORITY**

Prepared by Willdan Financial Services



Exhibit 1
System Development Fee Analysis
Existing Capital Costs Recoverable From SDFs
Northern Water & Sewer Systems

Line	Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
NORTHERN WATER ASSETS					
Water Assets by Category:					
1	Computer Equipment	\$ 725,489	\$ 725,489	\$ (400,525)	\$ 324,964
2	Equipment	364,072	373,386	(245,196)	128,190
3	Furniture & Fixtures	85,026	85,026	(57,121)	27,905
4	Land	367,177	367,177	0	367,177
5	Office Building	398,617	398,617	(213,468)	185,149
6	Plant & Distribution Systems	18,320,812	38,634,478	(19,818,078)	18,816,400
7	Vehicles	237,044	237,044	(215,199)	21,845
8	Total	<u>\$ 20,498,237</u>	<u>\$ 40,821,217</u>	<u>\$ (20,949,587)</u>	<u>\$ 19,871,630</u>
Adjusted For Assumed Cost Limit (\$):					
9	Computer Equipment	\$ 505,670	\$ 505,670	\$ (304,424)	\$ 201,246
10	Equipment	0	0	0	0
11	Furniture & Fixtures	0	0	0	0
12	Land	161,875	161,875	0	161,875
13	Office Building	261,588	261,588	(131,879)	129,709
14	Plant & Distribution Systems	16,135,200	33,842,280	(17,090,463)	16,751,817
15	Vehicles	50,258	50,258	(50,258)	0
16	Total	<u>\$ 17,114,591</u>	<u>\$ 34,821,671</u>	<u>\$ (17,577,024)</u>	<u>\$ 17,244,647</u>
NORTHERN SEWER ASSETS					
Sewer Assets by Category:					
17	Computer Equipment	\$ 471,683	\$ 471,683	\$ (224,396)	\$ 247,287
18	Equipment	437,645	470,278	(324,057)	146,221
19	Furniture & Fixtures	108,297	108,297	(74,135)	34,162
20	Land	420,897	420,897	0	420,897
21	Office Building	398,617	398,617	(213,468)	185,149
22	Plant & Distribution Systems	33,406,781	67,388,501	(34,842,288)	32,546,213
23	Vehicles	258,127	258,127	(221,228)	36,899
24	Total	<u>\$ 35,502,047</u>	<u>\$ 69,516,400</u>	<u>\$ (35,899,572)</u>	<u>\$ 33,616,828</u>
Adjusted For Assumed Cost Limit (\$):					
25	Computer Equipment	\$ 236,101	\$ 236,101	\$ (113,670)	\$ 122,431
26	Equipment	0	0	0	0
27	Furniture & Fixtures	0	0	0	0
28	Land	264,494	264,494	0	264,494
29	Office Building	261,588	261,588	(131,879)	129,709
30	Plant & Distribution Systems	29,636,011	59,881,928	(30,902,070)	28,979,858
31	Vehicles	50,258	50,258	(50,258)	0
32	Total	<u>\$ 30,448,452</u>	<u>\$ 60,694,369</u>	<u>\$ (31,197,877)</u>	<u>\$ 29,496,492</u>

Exhibit 1
System Development Fee Analysis
Existing Capital Costs Recoverable From SDFs
Northern Water & Sewer Systems

Line	Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
NORTHERN SYSTEM ASSETS					
Total Assets by Category:					
33	Computer Equipment	\$ 1,197,172	\$ 1,197,172	\$ (624,921)	\$ 572,251
34	Equipment	801,717	843,664	(569,253)	274,411
35	Furniture & Fixtures	193,323	193,323	(131,256)	62,067
36	Land	788,074	788,074	0	788,074
37	Office Building	797,234	797,234	(426,936)	370,298
38	Plant & Distribution Systems	51,727,593	106,022,979	(54,660,366)	51,362,613
39	Vehicles	495,171	495,171	(436,427)	58,744
40	Total	<u>\$ 56,000,284</u>	<u>\$ 110,337,617</u>	<u>\$ (56,849,159)</u>	<u>\$ 53,488,458</u>
Adjusted For Assumed Cost Limit (\$):					
41	Computer Equipment	\$ 741,771	\$ 741,771	\$ (418,094)	\$ 323,677
42	Equipment	0	0	0	0
43	Furniture & Fixtures	0	0	0	0
44	Land	426,369	426,369	0	426,369
45	Office Building	523,176	523,176	(263,758)	259,418
46	Plant & Distribution Systems	45,771,211	93,724,208	(47,992,533)	45,731,675
47	Vehicles	100,516	100,516	(100,516)	0
48	Total	<u>\$ 47,563,043</u>	<u>\$ 95,516,040</u>	<u>\$ (48,774,901)</u>	<u>\$ 46,741,139</u>
Recoverable Allocation - Water (%):					
49	Computer Equipment				0%
50	Equipment				0%
51	Furniture & Fixtures				0%
52	Land				100%
53	Office Building				100%
54	Plant & Distribution Systems				100%
55	Vehicles				0%
Recoverable Allocation - Wastewater (%):					
56	Computer Equipment				0%
57	Equipment				0%
58	Furniture & Fixtures				0%
59	Land				100%
60	Office Building				100%
61	Plant & Distribution Systems				100%
62	Vehicles				0%

Exhibit 1
System Development Fee Analysis
Existing Capital Costs Recoverable From SDFs
Northern Water & Sewer Systems

Line	Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
System Allocation - Water (\$):					
63	Computer Equipment				\$ 0
64	Equipment				0
65	Furniture & Fixtures				0
66	Land				161,875
67	Office Building				129,709
68	Plant & Distribution Systems				16,751,817
69	Vehicles				0
70	Total				<u>\$ 17,043,401</u>
System Allocation - Wastewater (\$):					
71	Computer Equipment				\$ 0
72	Equipment				0
73	Furniture & Fixtures				0
74	Land				264,494
75	Office Building				129,709
76	Plant & Distribution Systems				28,979,858
77	Vehicles				0
78	Total				<u>\$ 29,374,061</u>
79	Grand Total Recoverable Assets				<u><u>\$ 46,417,462</u></u>

COMPONENT ALLOCATION

Total Recoverable Water Facilities:					
80	Treatment Facilities			40.59%	\$ 6,918,361
81	Transmission Facilities			59.41%	10,125,040
82	Subtotal			<u>100.00%</u>	<u>\$ 17,043,401</u>
Total Recoverable Wastewater Facilities:					
83	Treatment Facilities			69.43%	\$ 20,393,137
84	Transmission Facilities			30.57%	8,980,924
85	Subtotal			<u>100.00%</u>	<u>\$ 29,374,061</u>
Combined Recoverable Facilities:					
86	Treatment Facilities			58.84%	\$ 27,311,498
87	Transmission Facilities			41.16%	19,105,964
88	Total			<u>100.00%</u>	<u>\$ 46,417,462</u>

Exhibit 1
System Development Fee Analysis
Existing Capital Costs Recoverable From SDFs
Northern Water & Sewer Systems

Line	Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
COMPARISON TO TOTAL					
89	Total Utility Assets				\$ 53,488,458
90	Combined Recoverable Assets				\$ 46,417,462
Difference (Assets Excluded From Recovery):					
91	Excluded From Recovery (\$)				\$ 7,070,996
92	Excluded From Recovery (%)				13.22%
DEBT SERVICE CREDIT					
93	Outstanding Debt Principal				\$ 11,111,696
Allocation Percentage:					
94	Water				9.57%
95	Wastewater				90.43%
Allocated Debt Service Credit:					
96	Water				\$ 1,063,296
97	Wastewater				10,048,400
98	Total				\$ 11,111,696
Component Allocation - Water:					
99	Treatment Facilities			40.59%	\$ 431,620
100	Transmission Facilities			59.41%	631,676
101	Total			100.00%	\$ 1,063,296
Component Allocation - Wastewater:					
102	Treatment Facilities			69.43%	\$ 6,976,168
103	Transmission Facilities			30.57%	3,072,232
104	Total			100.00%	\$ 10,048,400

Exhibit 2
System Development Fee Analysis
Existing Capital Costs Recoverable From SDFs
Southern Sewer System

Line	Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
SOUTHERN SEWER SYSTEM					
Total Assets by Category:					
1	Computer Equipment	\$ 0	\$ 0	\$ 0	\$ 0
2	Equipment	9,394	23,535	(23,535)	0
3	Furniture & Fixtures	0	0	0	0
4	Land	857,689	857,689	0	857,689
5	Office Building	0	0	0	0
6	Plant & Distribution Systems	2,725,415	5,736,095	(3,416,284)	2,319,811
7	Vehicles	21,248	21,248	(21,248)	0
8	Total	\$ 3,613,746	\$ 6,638,567	\$ (3,461,067)	\$ 3,177,500
Adjusted For Assumed Cost Limit (\$):					
9	Computer Equipment	\$ 0	\$ 0	\$ 0	\$ 0
10	Equipment	0	0	0	0
11	Furniture & Fixtures	0	0	0	0
12	Land	815,289	815,289	0	815,289
13	Office Building	0	0	0	0
14	Plant & Distribution Systems	2,371,376	4,946,023	(2,888,707)	2,057,316
15	Vehicles	0	0	0	0
16	Total	\$ 3,186,665	\$ 5,761,312	\$ (2,888,707)	\$ 2,872,605
Recoverable Allocation - Wastewater (%):					
17	Computer Equipment				0%
18	Equipment				0%
19	Furniture & Fixtures				0%
20	Land				100%
21	Office Building				100%
22	Plant & Distribution Systems				100%
23	Vehicles				0%
System Allocation - Wastewater (\$):					
24	Computer Equipment			\$ 0	
25	Equipment			0	
26	Furniture & Fixtures			0	
27	Land			815,289	
28	Office Building			0	
29	Plant & Distribution Systems			2,057,316	
30	Vehicles			0	
31	Total			\$ 2,872,605	
32	Grand Total Recoverable Assets			\$ 2,872,605	

Exhibit 2
System Development Fee Analysis
Existing Capital Costs Recoverable From SDFs
Southern Sewer System

Line	Description	Original Cost	Replacement Cost New	Accumulated Depreciation	RCNLD
COMPONENT ALLOCATION					
Total Recoverable Wastewater Facilities:					
33	Treatment Facilities			59.88%	\$ 1,720,091
34	Transmission Facilities			40.12%	1,152,514
35	Total			100.00%	\$ 2,872,605
COMPARISON TO TOTAL					
36	Total Utility Assets				\$ 3,177,500
Difference (Assets Excluded From Recovery):					
37	Excluded From Recovery (\$)				\$ 304,895
38	Excluded From Recovery (%)				9.60%
DEBT SERVICE CREDIT					
39	Outstanding Debt Principal				\$ 0

Exhibit 3
System Development Fee Analysis
Current Capital Improvement Program
Water & Sewer Systems

Line	Description	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NORTHERN WATER SYSTEM PROJECTS												
1	Buchanan Loop Road Water Main Extension	\$ 75,917	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	75,917
2	Clearwell-WTP-TWSA	418,038	418,038	0	0	0	0	0	0	0	0	0
3	Building Main Office-TWSA	46,200	46,200	0	0	0	0	0	0	0	0	0
4	Water Tank Maintenance-TWSA	206,813	0	206,813	0	0	0	0	0	0	0	0
5	Skyland Drive Water Relocation-TWSA	93,144	0	93,144	0	0	0	0	0	0	0	0
6	Cowan Valley Water System Consolidation	463,470	463,470	0	0	0	0	0	0	0	0	0
7	Raw Water Intake Improvements-TWSA	262,500	262,500	0	0	0	0	0	0	0	0	0
8	Rhodes Cove Water Pump Station Replacement	182,011	182,011	0	0	0	0	0	0	0	0	0
9	Savannah Drive Water Line Replacement	129,413	129,413	0	0	0	0	0	0	0	0	0
10	Booster Pump Station Upgrades, Dillsboro/Ridgeway	154,014	0	0	154,014	0	0	0	0	0	0	0
11	WTP Phase I Expansion Preliminary Planning	60,665	0	60,665	0	0	0	0	0	0	0	0
12	System Development Fee Rate Review	36,750	36,750	0	0	0	0	0	0	0	0	0
13	High Priority Water Main Replacement	757,188	0	0	0	757,188	0	0	0	0	0	0
14	Griffin Water Tank Rehabilitation	419,824	0	0	0	419,824	0	0	0	0	0	0
15	Rhodes Cove Water Tank Rehabilitation	212,496	0	0	0	212,496	0	0	0	0	0	0
16	Hospital Water Tank Rehabilitation	332,880	0	0	0	332,880	0	0	0	0	0	0
17	Old Settlement Road Water Line Extension/Loop	1,182,821	0	0	0	0	1,182,821	0	0	0	0	0
18	NCDOT R-5600 107 Project - Water Betterments	419,063	0	0	0	0	0	419,063	0	0	0	0
19	Clearwell/WCU Tank Rehabilitation	501,702	0	0	0	0	0	501,702	0	0	0	0
20	SCC Tank Rehabilitation	501,702	0	0	0	0	0	501,702	0	0	0	0
21	WTP Expansion Phase 1	16,683,799	0	0	0	182,400	191,550	4,899,567	5,566,763	5,843,519	0	0
23	Total Water	\$ 23,140,410	\$ 1,538,382	\$ 360,622	\$ 154,014	\$ 1,904,788	\$ 1,374,371	\$ 6,322,034	\$ 5,566,763	\$ 5,843,519	\$ 0	\$ 75,917
NORTHERN SEWER SYSTEM PROJECTS												
24	Jackson Paper Lift Station	\$ 1,967,715	\$ 1,967,715	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	0
25	Savannah Drive Sewer Main Replacement	262,500	262,500	0	0	0	0	0	0	0	0	0
26	Upgrade Pump Station #6 - Savannah	205,296	0	205,296	0	0	0	0	0	0	0	0
27	NCDOT R-5600 107 Project - Sewer Betterments	419,063	0	0	0	0	0	419,063	0	0	0	0
28	Upgrade Pump Station #7 - Riverchase	90,903	0	0	90,903	0	0	0	0	0	0	0
29	Upgrade Pump Station #8 - Gunter	90,903	0	0	90,903	0	0	0	0	0	0	0
30	WWTP#2-Phase II Rehabilitation-TWSA	8,471,748	0	4,132,834	4,338,914	0	0	0	0	0	0	0
31	Upgrade Pump Station #9 - Hoopers	69,397	0	0	0	0	0	69,397	0	0	0	0
32	Upgrade Pump Station #10 - Crossings	105,600	0	0	0	0	0	0	105,600	0	0	0
33	Upgrade WWTP #1	158,087	0	0	0	0	0	0	0	0	158,087	0
34	Sewer System Lift Station Upgrades-TWSA	26,250	26,250	0	0	0	0	0	0	0	0	0
35	WWTP Sludge Mgmt Advanced Planning	42,000	42,000	0	0	0	0	0	0	0	0	0
36	High Priority Gravity Sewer Replacement	4,781,419	62,853	0	69,318	0	76,441	0	84,283	0	92,903	4,395,621
37	High Priority Pressure Sewer Replacement	882,330	0	0	0	882,330	0	0	0	0	0	0
38	Building Main Office-TWSA	46,200	46,200	0	0	0	0	0	0	0	0	0
39	System Development Fee Rate Review - TWSA	36,750	36,750	0	0	0	0	0	0	0	0	0
40	Total Northern Sewer	\$ 17,656,161	\$ 2,444,268	\$ 4,338,130	\$ 4,590,038	\$ 882,330	\$ 76,441	\$ 488,460	\$ 189,883	\$ 0	\$ 250,990	\$ 4,395,621
41	Total Northern Water & Sewer CIP	\$ 40,796,571	\$ 3,982,650	\$ 4,698,752	\$ 4,744,052	\$ 2,787,118	\$ 1,450,812	\$ 6,810,494	\$ 5,756,646	\$ 5,843,519	\$ 250,990	\$ 4,471,538

Exhibit 3
System Development Fee Analysis
Current Capital Improvement Program
Water & Sewer Systems

Line	Description	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTHERN SEWER SYSTEM PROJECTS												
1	Upgrade WWTP #3	\$ 2,195,191	\$ 0	\$ 436,788	\$ 0	\$ 0	\$ 1,758,403	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
2	Horsepasture River WWTP-TWSA	20,898,122	0	20,898,122	0	0	0	0	0	0	0	0
3	Upgrade Pump Station #12 - Intersection	100,320	0	0	0	100,320	0	0	0	0	0	0
4	Upgrade Pump Station #16 - Sheep Laurel	229,700	0	0	0	0	229,700	0	0	0	0	0
5	Upgrade Pump Station #17 - Slab Town	110,850	0	0	0	0	0	0	0	110,850	0	0
6	Upgrade Pump Station #18 - Chestnut Square	109,804	0	0	0	0	0	0	0	0	109,804	0
7	Sewer System Lift Station Upgrades-TWSA	6,563	6,563	0	0	0	0	0	0	0	0	0
8	WWTP Sludge Mgmt Advanced Planning	10,500	10,500	0	0	0	0	0	0	0	0	0
9	High Priority Gravity Sewer Replacement	1,195,354	15,713	0	17,329	0	19,110	0	21,071	0	23,226	1,098,905
10	High Priority Pressure Sewer Replacement	220,582	0	0	0	220,582	0	0	0	0	0	0
11	Total Southern Sewer CIP	\$ 25,076,986	\$ 32,776	\$ 21,334,910	\$ 17,329	\$ 320,902	\$ 2,007,213	\$ 0	\$ 21,071	\$ 110,850	\$ 133,030	\$ 1,098,905

Exhibit 4

**System Development Fee Analysis
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
NORTHERN WATER SYSTEM PROJECTS								
1	Buchanan Loop Road Water Main Extension	\$ 75,917	0.00%	0.00%	100.00%	\$ 0	\$ 0	\$ 75,917
2	Clearwell-WTP-TWSA	418,038	0.00%	0.00%	100.00%	0	0	418,038
3	Building Main Office-TWSA	46,200	0.00%	0.00%	100.00%	0	0	46,200
4	Water Tank Maintenance-TWSA	206,813	0.00%	100.00%	0.00%	0	206,813	0
5	Skyland Drive Water Relocation-TWSA	93,144	0.00%	0.00%	100.00%	0	0	93,144
6	Cowan Valley Water System Consolidation	463,470	100.00%	0.00%	0.00%	463,470	0	0
7	Raw Water Intake Improvements-TWSA	262,500	100.00%	0.00%	0.00%	262,500	0	0
8	Rhodes Cove Water Pump Station Replacement	182,011	0.00%	100.00%	0.00%	0	182,011	0
9	Savannah Drive Water Line Replacement	129,413	0.00%	100.00%	0.00%	0	129,413	0
10	Booster Pump Station Upgrades, Dillsboro/Ridgeway	154,014	100.00%	0.00%	0.00%	154,014	0	0
11	WTP Phase I Expansion Preliminary Planning	60,665	100.00%	0.00%	0.00%	60,665	0	0
12	System Development Fee Rate Review	36,750	0.00%	0.00%	100.00%	0	0	36,750
13	High Priority Water Main Replacement	757,188	0.00%	100.00%	0.00%	0	757,188	0
14	Griffin Water Tank Rehabilitation	419,824	0.00%	100.00%	0.00%	0	419,824	0
15	Rhodes Cove Water Tank Rehabilitation	212,496	0.00%	100.00%	0.00%	0	212,496	0
16	Hospital Water Tank Rehabilitation	332,880	0.00%	100.00%	0.00%	0	332,880	0
17	Old Settlement Road Water Line Extension/Loop	1,182,821	100.00%	0.00%	0.00%	1,182,821	0	0
18	NCDOT R-5600 107 Project - Water Betterments	419,063	100.00%	0.00%	0.00%	419,063	0	0
19	Clearwell/WCU Tank Rehabilitation	501,702	0.00%	100.00%	0.00%	0	501,702	0
20	SCC Tank Rehabilitation	501,702	0.00%	100.00%	0.00%	0	501,702	0
21	WTP Expansion Phase 1	16,683,799	100.00%	0.00%	0.00%	16,683,799	0	0
22	Subtotal	\$ 23,140,410				\$ 19,226,332	\$ 3,244,029	\$ 670,049

Exhibit 4

**System Development Fee Analysis
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
NORTHERN SEWER SYSTEM PROJECTS								
23	Jackson Paper Lift Station	\$ 1,967,715	79.79%	0.00%	20.21%	\$ 1,570,040	\$ 0	\$ 397,675
24	Savannah Drive Sewer Main Replacement	262,500	0.00%	100.00%	0.00%	0	262,500	0
25	Upgrade Pump Station #6 - Savannah	205,296	100.00%	0.00%	0.00%	205,296	0	0
26	NCDOT R-5600 107 Project - Sewer Betterments	419,063	100.00%	0.00%	0.00%	419,063	0	0
27	Upgrade Pump Station #7 - Riverchase	90,903	100.00%	0.00%	0.00%	90,903	0	0
28	Upgrade Pump Station #8 - Gunter	90,903	100.00%	0.00%	0.00%	90,903	0	0
29	WWTP#2-Phase II Rehabilitation-TWSA	8,471,748	100.00%	0.00%	0.00%	8,471,748	0	0
30	Upgrade Pump Station #9 - Hoopers	69,397	100.00%	0.00%	0.00%	69,397	0	0
31	Upgrade Pump Station #10 - Crossings	105,600	100.00%	0.00%	0.00%	105,600	0	0
32	Upgrade WWTP #1	158,087	100.00%	0.00%	0.00%	158,087	0	0
33	Sewer System Lift Station Upgrades-TWSA	26,250	100.00%	0.00%	0.00%	26,250	0	0
34	WWTP Sludge Mgmt Advanced Planning	42,000	0.00%	0.00%	100.00%	0	0	42,000
35	High Priority Gravity Sewer Replacement	4,781,419	0.00%	100.00%	0.00%	0	4,781,419	0
36	High Priority Pressure Sewer Replacement	882,330	0.00%	100.00%	0.00%	0	882,330	0
37	Building Main Office-TWSA	46,200	0.00%	0.00%	100.00%	0	0	46,200
38	System Development Fee Rate Review - TWSA	36,750	0.00%	0.00%	100.00%	0	0	36,750
39	Subtotal	\$ 17,656,161				\$ 11,207,287	\$ 5,926,249	\$ 522,625
40	Total - All Capital Projects	\$ 40,796,571				\$ 30,433,619	\$ 9,170,278	\$ 1,192,674

Exhibit 4

**System Development Fee Analysis
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:								
41	Treatment Projects	\$ 16,790,664	\$ 16,744,464	\$ 0	\$ 46,200			
42	Transmission Projects	6,312,996	2,481,868	3,244,029	587,099			
43	Other Projects	36,750	0	0	36,750			
44	Subtotal	\$ 23,140,410	\$ 19,226,332	\$ 3,244,029	\$ 670,049			
Wastewater:								
45	Treatment Projects	\$ 8,718,035	\$ 8,629,835	\$ 0	\$ 88,200			
46	Transmission Projects	8,901,376	2,577,452	5,926,249	397,675			
47	Other Projects	36,750	0	0	36,750			
48	Subtotal	\$ 17,656,161	\$ 11,207,287	\$ 5,926,249	\$ 522,625			
Combined:								
49	Treatment Projects	\$ 25,508,699	\$ 25,374,299	\$ 0	\$ 134,400			
50	Transmission Projects	15,214,372	5,059,320	9,170,278	984,774			
51	Other Projects	73,500	0	0	73,500			
52	Grand Total	\$ 40,796,571	\$ 30,433,619	\$ 9,170,278	\$ 1,192,674			

Exhibit 4

**System Development Fee Analysis
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
SOUTHERN SEWER SYSTEM PROJECTS								
1	Upgrade WWTP #3	\$ 2,195,191	100.00%	0.00%	0.00%	\$ 2,195,191	\$ 0	\$ 0
2	Horsepasture River WWTP-TWSA	20,898,122	88.15%	0.00%	11.85%	18,421,005	0	2,477,117
3	Upgrade Pump Station #12 - Intersection	100,320	100.00%	0.00%	0.00%	100,320	0	0
4	Upgrade Pump Station #16 - Sheep Laurel	229,700	100.00%	0.00%	0.00%	229,700	0	0
5	Upgrade Pump Station #17 - Slab Town	110,850	100.00%	0.00%	0.00%	110,850	0	0
6	Upgrade Pump Station #18 - Chestnut Square	109,804	100.00%	0.00%	0.00%	109,804	0	0
7	Sewer System Lift Station Upgrades-TWSA	6,563	100.00%	0.00%	0.00%	6,563	0	0
8	WWTP Sludge Mgmt Advanced Planning	10,500	0.00%	0.00%	100.00%	0	0	10,500
9	High Priority Gravity Sewer Replacement	1,195,354	0.00%	100.00%	0.00%	0	1,195,354	0
10	High Priority Pressure Sewer Replacement	220,582	0.00%	100.00%	0.00%	0	220,582	0
11	Total Capital Projects	\$ 25,076,986				\$ 21,173,433	\$ 1,415,936	\$ 2,487,617
ALLOCATION OF CAPITAL PROJECTS								
Wastewater								
12	Treatment Projects	\$ 17,879,283				\$ 16,010,945	\$ 0	\$ 1,868,338
13	Transmission Projects	7,197,703				5,162,488	1,415,936	619,279
14	Other Projects	0				0	0	0
15	Grand Total	\$ 25,076,986				\$ 21,173,433	\$ 1,415,936	\$ 2,487,617

Note:

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 5
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Northern Water System

Line	Description	Total
Recoverable Capital Facilities		
Existing Facilities:		
1	Treatment Facilities	\$ 6,918,361
2	Transmission Facilities	10,125,040
3	Subtotal	\$ 17,043,401 ⁽¹⁾
Less Debt Service Principal:		
4	Treatment Facilities	\$ (431,620)
5	Transmission Facilities	(631,676)
6	Subtotal	\$ (1,063,296) ⁽²⁾
Net Recoverable Existing Facilities:		
7	Treatment Facilities	\$ 6,486,741
8	Transmission Facilities	9,493,364
9	Total	\$ 15,980,105
Capital Improvement Program:		
10	Treatment Facilities	\$ 16,744,464
11	Transmission Facilities	2,481,868
12	Subtotal	\$ 19,226,332
Less 25% CIP Adjustment:		
13	Treatment Facilities	25% \$ (4,186,116)
14	Transmission Facilities	25% (620,467)
15	Subtotal	\$ (4,806,583) ⁽³⁾
Net Recoverable CIP:		
16	Treatment Facilities	\$ 12,558,348
17	Transmission Facilities	1,861,401
18	Total	\$ 14,419,749
Net Capital Costs:		
19	Treatment Facilities	\$ 19,045,089
20	Transmission Facilities	11,354,765
21	Net Recoverable Costs	\$ 30,399,854

Exhibit 5
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Northern Water System

Line	Description		Total
Available System Capacity (MGD)			
<u>Existing Treatment Capacity:</u>			
22	Tuckasegee Water Treatment Plant		1.500
23	Additional CIP Capacity		1.250
24	Total Capacity of Treatment Facilities (MGD)		2.750 ⁽⁴⁾
<u>Average Day Capacity Adjustment:</u>			
25	Treatment Capacity Based on Max/Avg Day Factor	1.50	1.833
26	Unaccounted-For Water Capacity Adjustment	10.0%	(5)
27	Estimated Treatment Capacity		1.650
<u>Estimated Transmission System Capacity:</u>			
28	Existing Max Day Treatment Capacity		2.750
29	Transmission-to-Treatment Capacity Factor	2.00	
30	Assumed Existing Transmission Capacity		5.500 ⁽⁶⁾
31	Unaccounted-For Water Capacity Adjustment	10.0%	(6)
32	Estimated Transmission Capacity		4.950

Exhibit 5
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Northern Water System

Line	Description	Total
Estimated Cost Per Gallon of Capacity		
<u>Estimated Cost Per Gallon of Capacity:</u>		
33	Treatment (\$/Gallon)	\$ 11.54
34	Transmission (\$/Gallon)	2.29
35	Total Cost Per Gallon of Capacity	\$ 13.83
36	Daily NCAC Residential Flow Requirement	400 ⁽⁷⁾
37	Max/Avg Day Adjustment Factor	1.50
38	Assumed Standard Level of Service Per ERU (GPD of Capacity)	267 ⁽⁷⁾
Calculation of Fee Per ERU		
<u>Calculation of SDF Per ERU:</u>		
39	Treatment Facilities	\$ 3,081
40	Transmission Facilities	611
41	Combined Cost	\$ 3,692
<u>Adjusted Fee - Treatment:</u>		
42	Calculated Fee Per ERU	\$ 3,081
43	Less Rounding Adjustment	(1)
44	Adjusted Fee	\$ 3,080
<u>Credit Adjusted Fee - Transmission:</u>		
45	Calculated Fee Per ERU	\$ 611
46	Less Rounding Adjustment	(1)
47	Adjusted Fee	\$ 610
<u>Proposed SDF Per ERU (Rounded):</u>		
48	Treatment Facilities	\$ 3,080
49	Transmission Facilities	610
50	Combined Cost	\$ 3,690

Exhibit 5
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Northern Water 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) This adjustment is made in accordance with House Bill 436, § 162A-207. Minimum requirements.
- (4) Based on rated maximum daily plant capacity information as provided by staff.
- (5) 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 15.0%.
- (6) It is assumed that the existing transmission facilities are capable of providing average water flow at least 2-times the existing maximum flow amount of 5.50 MGD permitted for the combined water treatment facilities. In addition, similar to the methodology utilized for water treatment, an adjustment is made for unaccounted-for water assuming losses of 15.0%.
- (7) The system development charges 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 daily water flow capacity design standards adopted by the State of North Carolina and defined the North Carolina Administrative Codes (15A NCAC 18C .0409), the level of service requirement for a residential connection is 400 gallons per day (gpd). Although the Codes do not specifically indicate whether 400 gpd is max-day or average-day, for the purpose of this analysis, it is assumed to be a max-day flow amount. Applying the assumed Max/Avg Day Adjustment Factor to the NCAC flow standard, it is assumed that 1 ERU requires a standard level of service of 267 gpd of water system capacity.

Exhibit 6
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Northern Sewer System

Line	Description	Total
Recoverable Capital Facilities		
Existing Facilities:		
1	Treatment Facilities	\$ 20,393,137
2	Transmission Facilities	8,980,924
3	Subtotal	\$ 29,374,061 ⁽¹⁾
Less Debt Service Principal:		
4	Treatment Facilities	\$ (6,976,168)
5	Transmission Facilities	(3,072,232)
6	Subtotal	\$ (10,048,400) ⁽²⁾
Net Recoverable Existing Facilities:		
7	Treatment Facilities	\$ 13,416,969
8	Transmission Facilities	5,908,692
9	Total	\$ 19,325,661
Capital Improvement Program:		
10	Treatment Facilities	\$ 8,629,835
11	Transmission Facilities	2,577,452
12	Subtotal	\$ 11,207,287
Less 25% CIP Adjustment:		
13	Treatment Facilities	25% \$ (2,157,459)
14	Transmission Facilities	25% (644,363)
15	Subtotal	\$ (2,801,822) ⁽³⁾
Net Recoverable CIP:		
16	Treatment Facilities	\$ 6,472,376
17	Transmission Facilities	1,933,089
18	Total	\$ 8,405,465
Net Capital Costs:		
19	Treatment Facilities	\$ 19,889,345
20	Transmission Facilities	7,841,781
21	Net Recoverable Costs	\$ 27,731,126

Exhibit 6
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Northern Sewer System

Line	Description	Total
Available System Capacity (MGD)		
<u>Existing Treatment Capacity:</u>		
22	WWTP #1 (Northern System)	3.500
23	WWTP #2 (Northern System)	0.500
24	WWTP #4 (Whittier)	0.200
25	Total Existing Capacity of Wastewater Facilities	4.200
<u>Additional CIP Capacity:</u>		
26	WWTP #1 (Northern System)	0.000
27	WWTP #2 (Northern System)	0.000
28	WWTP #4 (Whittier)	0.000
29	Total Additional CIP Capacity	0.000
<u>Combined Treatment Capacity (MGD):</u>		
30	WWTP #1 (Northern System)	3.500
31	WWTP #2 (Northern System)	0.500
32	WWTP #4 (Whittier)	0.200
33	Total Capacity of Treatment Facilities (MGD)	4.200
<u>Treatment Capacity:</u>		
34	Average Day Treatment Capacity (MGD)	4.200
35	I&I Capacity Adjustment	20.0% ⁽⁴⁾
36	Adjusted Average Day Treatment Capacity	3.360
<u>Estimated Transmission System Capacity:</u>		
37	Transmission-to-Treatment Capacity Factor	2.00
38	Assumed Gross Transmission Capacity	8.400 ⁽⁵⁾
39	I&I Capacity Adjustment	20.0%
40	Estimated Transmission Capacity	6.720 ⁽⁴⁾

Exhibit 6
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Northern Sewer System

Line	Description	Total
Estimated Cost Per Gallon of Capacity		
<u>Estimated Cost Per Gallon of Capacity:</u>		
41	Treatment (\$/Gallon)	\$ 5.92
42	Transmission (\$/Gallon)	1.17
43	Total Cost Per Gallon of Capacity	\$ 7.09
44	Assumed Standard Level of Service Per ERU (GPD of Capacity)	360 ⁽⁶⁾
Calculation of Fee Per ERU		
<u>Calculation of SDF Per ERU:</u>		
45	Treatment Facilities	\$ 2,131
46	Transmission Facilities	421
47	Combined Cost	\$ 2,552
<u>Adjusted Fee - Treatment:</u>		
48	Calculated Fee Per ERU	\$ 2,131
49	Less Rounding Adjustment	(1)
50	Adjusted Fee	\$ 2,130
<u>Credit Adjusted Fee - Transmission:</u>		
51	Calculated Fee Per ERU	\$ 421
52	Less Rounding Adjustment	(1)
53	Adjusted Fee	\$ 420
<u>Proposed SDF Per ERU (Rounded):</u>		
54	Treatment Facilities	\$ 2,130
55	Transmission Facilities	420
56	Combined Cost	\$ 2,550

Exhibit 6
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Northern Sewer 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) This adjustment is made in accordance with House Bill 436, § 162A-207. Minimum requirements.
- (4) 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.
- (5) It is assumed that the wastewater trunk lines and pumping facilities are designed to provide capacity at least 2-times the permitted plant flow amount of 8.400 MGD.
- (6) Similar to the water system, the system development charges 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 of North Carolina and defined in 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, the analysis developed herein assumed that 1 ERU is 3 bedrooms. The resulting standard LOS is 360 gpd of wastewater system capacity per ERU.

Exhibit 7
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Southern Sewer System

Line	Description	Total
Recoverable Capital Facilities		
Existing Facilities:		
1	Treatment Facilities	\$ 1,720,091
2	Transmission Facilities	1,152,514
3	Subtotal	\$ 2,872,605 ⁽¹⁾
Net Recoverable Existing Facilities:		
4	Treatment Facilities	\$ 1,720,091
5	Transmission Facilities	1,152,514
6	Total	\$ 2,872,605
Capital Improvement Program:		
7	Treatment Facilities	\$ 16,010,945
8	Transmission Facilities	5,162,488
9	Subtotal	\$ 21,173,433
Less 25% CIP Adjustment:		
10	Treatment Facilities 25%	\$ (4,002,736)
11	Transmission Facilities 25%	(1,290,622)
12	Subtotal	\$ (5,293,358) ⁽³⁾
Net Recoverable CIP:		
13	Treatment Facilities	\$ 12,008,209
14	Transmission Facilities	3,871,866
15	Total	\$ 15,880,075
Less Debt Service Principal:		
16	Treatment Facilities	\$ 0
17	Transmission Facilities	0
18	Subtotal	\$ 0 ⁽²⁾
Net Capital Costs:		
19	Treatment Facilities	\$ 13,728,300
20	Transmission Facilities	5,024,380
21	Net Recoverable Costs	\$ 18,752,680

Exhibit 7
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Southern Sewer System

Line	Description	Total
Available System Capacity (MGD)		
<u>Existing Treatment Capacity:</u>		
22	WWTP #3 (Southern System)	0.200
23	Total Existing Capacity of Wastewater Facilities	0.200
<u>Additional CIP Capacity:</u>		
24	WWTP #3 (Southern System)	0.000
25	Horsepasture River WWTP (Southern System)	0.125
26	Total Additional CIP Capacity	0.125
<u>Combined Treatment Capacity (MGD):</u>		
27	WWTP #3 (Southern System)	0.200
28	Horsepasture River WWTP (Southern System)	0.125
29	Total Combined Capacity of Water Treatment Facilities (MGD)	0.325
<u>Treatment Capacity:</u>		
30	Average Day Treatment Capacity (MGD)	0.325
31	I&I Capacity Adjustment	10.0% ⁽⁴⁾
32	Adjusted Average Day Treatment Capacity	0.293
<u>Estimated Transmission System Capacity:</u>		
33	Transmission-to-Treatment Capacity Factor	3.00
34	Assumed Gross Transmission Capacity	0.975 ⁽⁵⁾
35	I&I Capacity Adjustment	10.0%
36	Estimated Transmission Capacity	0.878 ⁽⁴⁾

Exhibit 7
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Southern Sewer System

Line	Description	Total
Estimated Cost Per Gallon of Capacity		
<u>Estimated Cost Per Gallon of Capacity:</u>		
37	Treatment (\$/Gallon)	\$ 46.85
38	Transmission (\$/Gallon)	5.72
39	Total Cost Per Gallon of Capacity	\$ 52.57
40	Assumed Standard Level of Service Per ERU (GPD of Capacity)	360 ⁽⁶⁾
Calculation of Fee Per ERU		
<u>Calculation of SDF Per ERU:</u>		
41	Treatment Facilities	\$ 16,866
42	Transmission Facilities	2,059
43	Combined Cost	\$ 18,925
<u>Adjusted Fee - Treatment:</u>		
44	Calculated Fee Per ERU	\$ 16,866
45	Less Rounding Adjustment	(6)
46	Adjusted Fee	\$ 16,860
<u>Credit Adjusted Fee - Transmission:</u>		
47	Calculated Fee Per ERU	\$ 2,059
48	Less Rounding Adjustment	(9)
49	Adjusted Fee	\$ 2,050
<u>Proposed SDF Per ERU (Rounded):</u>		
50	Treatment Facilities	\$ 16,860
51	Transmission Facilities	2,050
52	Combined Cost	\$ 18,910

Exhibit 7
System Development Fee Analysis
Calculation of System Development Fee Per ERU
Southern Sewer 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) This adjustment is made in accordance with House Bill 436, § 162A-207. Minimum requirements.
- (4) 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.
- (5) It is assumed that the wastewater trunk lines and pumping facilities are designed to provide capacity at least 3-times the permitted plant flow amount of .975 MGD.
- (6) Similar to the water system, the system development charges 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 of North Carolina and defined 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, the analysis developed herein assumed that 1 ERU is 3 bedrooms. The resulting standard LOS is 360 gpd of wastewater system capacity per ERU.

Exhibit 8
System Development Fee Analysis
Existing & Proposed System Development Fees
Northern Water & Sewer Systems

Line	Peak Flow GPM	SDF Category	ERU Factors		SDFs		Combined Fee
			Water	Sewer	Water	Sewer	
EXISTING SDFs							
1	7-10	A	0.67	0.67	\$ 450	\$ 518	\$ 968
2	20	B	1.00	1.00	\$ 675	\$ 777	\$ 1,452
3	25	C	1.25	1.27	\$ 844	\$ 985	\$ 1,829
4	30	D	1.50	1.52	\$ 1,013	\$ 1,182	\$ 2,195
5	40	E	1.96	2.02	\$ 1,323	\$ 1,566	\$ 2,889
6	50	F	2.45	2.52	\$ 1,654	\$ 1,958	\$ 3,612
7	78	G	3.85	3.92	\$ 2,600	\$ 3,044	\$ 5,644
8	106	H	5.23	5.32	\$ 3,533	\$ 4,137	\$ 7,670
9	134	I	13.23	13.46	\$ 8,933	\$ 10,459	\$ 19,392
10	160	J	15.80	16.07	\$ 10,665	\$ 12,488	\$ 23,153
11	195	K	19.24	19.59	\$ 12,987	\$ 15,224	\$ 28,211
12	230	L	22.69	23.11	\$ 15,318	\$ 17,957	\$ 33,275
13	265	M	26.15	26.63	\$ 17,649	\$ 20,690	\$ 38,339
14	300	N	29.60	30.15	\$ 19,980	\$ 23,423	\$ 43,403
15	350	O	34.58	35.21	\$ 23,342	\$ 27,358	\$ 50,700
16	400	P	39.52	40.24	\$ 26,676	\$ 31,266	\$ 57,942
17	450	Q	44.46	45.27	\$ 30,011	\$ 35,174	\$ 65,185
18	500	R	49.40	50.30	\$ 33,345	\$ 39,083	\$ 72,428
19	625	S	61.75	62.88	\$ 41,682	\$ 48,854	\$ 90,536
20	750	T	74.10	75.45	\$ 50,018	\$ 58,624	\$ 108,642
21	875	U	86.45	88.02	\$ 58,354	\$ 68,395	\$ 126,749
22	1000	V	98.80	100.60	\$ 66,690	\$ 78,165	\$ 144,855
23	1200	W	118.50	120.67	\$ 79,988	\$ 93,758	\$ 173,746
24	1400	X	138.25	140.78	\$ 93,319	\$ 109,384	\$ 202,703
25	1600	Y	158.00	160.89	\$ 106,650	\$ 125,010	\$ 231,660
26	1600+	Z	Calculated	Calculated	Calculated	Calculated	Calculated

Exhibit 8
System Development Fee Analysis
Existing & Proposed System Development Fees
Northern Water & Sewer Systems

Line	Peak Flow GPM	SDF Category	ERU Factors		SDFs		Combined Fee
			Water	Sewer	Water	Sewer	
PROPOSED/CALCULATED SDFs							
27	10	⁽¹⁾ A	0.67	0.67	\$ 2,472	\$ 1,709	\$ 4,181
28	20	B	1.00	1.00	\$ 3,690	\$ 2,550	\$ 6,240
29	25	C	1.25	1.25	\$ 4,613	\$ 3,188	\$ 7,800
30	30	D	1.50	1.50	\$ 5,535	\$ 3,825	\$ 9,360
31	40	E	2.00	2.00	\$ 7,380	\$ 5,100	\$ 12,480
32	50	F	2.50	2.50	\$ 9,225	\$ 6,375	\$ 15,600
33	78	G	3.90	3.90	\$ 14,391	\$ 9,945	\$ 24,336
34	106	H	5.30	5.30	\$ 19,557	\$ 13,515	\$ 33,072
35	134	I	6.70	6.70	\$ 24,723	\$ 17,085	\$ 41,808
36	160	J	8.00	8.00	\$ 29,520	\$ 20,400	\$ 49,920
37	195	K	9.75	9.75	\$ 35,978	\$ 24,863	\$ 60,840
38	230	L	11.50	11.50	\$ 42,435	\$ 29,325	\$ 71,760
39	265	M	13.25	13.25	\$ 48,893	\$ 33,788	\$ 82,680
40	300	N	15.00	15.00	\$ 55,350	\$ 38,250	\$ 93,600
41	350	O	17.50	17.50	\$ 64,575	\$ 44,625	\$ 109,200
42	400	P	20.00	20.00	\$ 73,800	\$ 51,000	\$ 124,800
43	450	Q	22.50	22.50	\$ 83,025	\$ 57,375	\$ 140,400
44	500	R	25.00	25.00	\$ 92,250	\$ 63,750	\$ 156,000
45	625	S	31.25	31.25	\$ 115,313	\$ 79,688	\$ 195,000
46	750	T	37.50	37.50	\$ 138,375	\$ 95,625	\$ 234,000
47	875	U	43.75	43.75	\$ 161,438	\$ 111,563	\$ 273,000
48	1000	V	50.00	50.00	\$ 184,500	\$ 127,500	\$ 312,000
49	1200	W	60.00	60.00	\$ 221,400	\$ 153,000	\$ 374,400
50	1400	X	70.00	70.00	\$ 258,300	\$ 178,500	\$ 436,800
51	1600	Y	80.00	80.00	\$ 295,200	\$ 204,000	\$ 499,200
52	1600+	Z	Calculated	Calculated	Calculated	Calculated	Calculated

Exhibit 8
System Development Fee Analysis
Existing & Proposed System Development Fees
Northern Water & Sewer Systems

Line	Peak Flow GPM	SDF Category	ERU Factors		SDFs		Combined Fee
			Water	Sewer	Water	Sewer	
DIFFERENCE							
53	10	⁽¹⁾ A	0.00	0.00	\$ 2,022	\$ 1,191	\$ 3,213
54	20	B	0.00	0.00	\$ 3,015	\$ 1,773	\$ 4,788
55	25	C	(0.00)	(0.02)	\$ 3,769	\$ 2,203	\$ 5,971
56	30	D	(0.00)	(0.02)	\$ 4,522	\$ 2,643	\$ 7,165
57	40	E	0.04	(0.02)	\$ 6,057	\$ 3,534	\$ 9,591
58	50	F	0.05	(0.02)	\$ 7,571	\$ 4,417	\$ 11,988
59	78	G	0.05	(0.02)	\$ 11,791	\$ 6,901	\$ 18,692
60	106	H	0.07	(0.02)	\$ 16,024	\$ 9,378	\$ 25,402
61	134	I	(6.53)	(6.76)	\$ 15,790	\$ 6,626	\$ 22,416
62	160	J	(7.80)	(8.07)	\$ 18,855	\$ 7,912	\$ 26,767
63	195	K	(9.49)	(9.84)	\$ 22,991	\$ 9,639	\$ 32,629
64	230	L	(11.19)	(11.61)	\$ 27,117	\$ 11,368	\$ 38,485
65	265	M	(12.90)	(13.38)	\$ 31,244	\$ 13,098	\$ 44,341
66	300	N	(14.60)	(15.15)	\$ 35,370	\$ 14,827	\$ 50,197
67	350	O	(17.08)	(17.71)	\$ 41,233	\$ 17,267	\$ 58,500
68	400	P	(19.52)	(20.24)	\$ 47,124	\$ 19,734	\$ 66,858
69	450	Q	(21.96)	(22.77)	\$ 53,014	\$ 22,201	\$ 75,215
70	500	R	(24.40)	(25.30)	\$ 58,905	\$ 24,667	\$ 83,572
71	625	S	(30.50)	(31.63)	\$ 73,631	\$ 30,834	\$ 104,464
72	750	T	(36.60)	(37.95)	\$ 88,357	\$ 37,001	\$ 125,358
73	875	U	(42.70)	(44.27)	\$ 103,084	\$ 43,168	\$ 146,251
74	1000	V	(48.80)	(50.60)	\$ 117,810	\$ 49,335	\$ 167,145
75	1200	W	(58.50)	(60.67)	\$ 141,412	\$ 59,242	\$ 200,654
76	1400	X	(68.25)	(70.78)	\$ 164,981	\$ 69,116	\$ 234,097
77	1600	Y	(78.00)	(80.89)	\$ 188,550	\$ 78,990	\$ 267,540
78	1600+	Z					

(1) The Proposed/Calculated fee for Category A assumes the fee will be applied to all new customers with a maximum peak flow of 10 gpm and below.

Exhibit 9
System Development Fee Analysis
Existing & Proposed System Development Fees
Southern Sewer System

Line	Peak Flow GPM	SDF Category	Existing		Proposed/Calculated		Difference	
			Factor	SDFs	Factor	SDFs	Factor	SDFs
1	7 – 10	(1) A	0.67	\$ 1,035	0.67	\$ 12,670	0.00	\$ 11,635
2	20	B	1.00	\$ 1,553	1.00	\$ 18,910	0.00	\$ 17,357
3	25	C	1.27	\$ 1,969	1.25	\$ 23,638	(0.02)	\$ 21,669
4	30	D	1.52	\$ 2,363	1.50	\$ 28,365	(0.02)	\$ 26,002
5	40	E	2.02	\$ 3,132	2.00	\$ 37,820	(0.02)	\$ 34,688
6	50	F	2.52	\$ 3,915	2.50	\$ 47,275	(0.02)	\$ 43,360
7	78	G	3.92	\$ 6,088	3.90	\$ 73,749	(0.02)	\$ 67,661
8	106	H	5.33	\$ 8,274	5.30	\$ 100,223	(0.03)	\$ 91,949
9	134	I	6.73	\$ 10,459	6.70	\$ 126,697	(0.03)	\$ 116,238
10	160	J	8.04	\$ 12,488	8.00	\$ 151,280	(0.04)	\$ 138,792
11	195	K	9.80	\$ 15,224	9.75	\$ 184,373	(0.05)	\$ 169,149
12	230	L	11.56	\$ 17,957	11.50	\$ 217,465	(0.06)	\$ 199,508
13	265	M	13.32	\$ 20,690	13.25	\$ 250,558	(0.07)	\$ 229,868
14	300	N	15.08	\$ 23,423	15.00	\$ 283,650	(0.08)	\$ 260,227
15	350	O	17.62	\$ 27,358	17.50	\$ 330,925	(0.12)	\$ 303,567
16	400	P	20.13	\$ 31,266	20.00	\$ 378,200	(0.13)	\$ 346,934
17	450	Q	22.65	\$ 35,174	22.50	\$ 425,475	(0.15)	\$ 390,301
18	500	R	25.17	\$ 39,083	25.00	\$ 472,750	(0.17)	\$ 433,667
19	625	S	31.46	\$ 48,854	31.25	\$ 590,938	(0.21)	\$ 542,084
20	750	T	37.75	\$ 58,624	37.50	\$ 709,125	(0.25)	\$ 650,501
21	875	U	44.04	\$ 68,395	43.75	\$ 827,313	(0.29)	\$ 758,918
22	1000	V	50.33	\$ 78,165	50.00	\$ 945,500	(0.33)	\$ 867,335
23	1200	W	60.37	\$ 93,758	60.00	\$ 1,134,600	(0.37)	\$ 1,040,842
24	1400	X	70.43	\$ 109,384	70.00	\$ 1,323,700	(0.43)	\$ 1,214,316
25	1600	Y	80.50	\$ 125,010	80.00	\$ 1,512,800	(0.50)	\$ 1,387,790
26	1600 +	Z	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated

(1) The Proposed/Calculated fee for Category A assumes the fee will be applied to all new customers with a maximum peak flow of 10 gpm and below.