

# City of Locust, NC

## Sewer System Development Fee Analysis

Project No. 3479-A  
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The logo for Wooten, featuring the word "Wooten" in a bold, dark blue sans-serif font. The letter "W" is stylized with a light blue triangle above its left vertical stroke.

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# 1. EXECUTIVE SUMMARY

In December 2017, the North Carolina General Assembly amended Chapter 162A of the General Statutes by passing House Bill 436. This amendment created “Article 8: System Development Fees”, and requires local governments to adopt uniform system development fees for public water and sewer systems by July 1, 2018 if the local government desires to charge system development fees thereafter. A factor driving the legislation is application of the ‘rational nexus text’, which requires decision makers to confirm the direct and reasonable connection between the impact of the new development, need for new infrastructure to support that development, and justify the appropriated **System Development Fees (SDFs)** necessary to support that growth. Prescribed methodologies to determine these SDFs are the *Buy-In (Equity) Cost Method*, *Incremental Cost (Marginal) Method*, and *Combined Cost Method*.

The City of Locust has retained the professional engineering services provided by The Wooten Company to conduct the SDF analysis for their sewer system. The most practical methodology to calculate SDFs for the City is the Combined Cost Method. This method accounts for the costs of existing infrastructure serving both existing and future customers while avoiding adverse financial impacts to existing customers for construction of new infrastructure necessary to support new development.

Based on existing infrastructure costs listed on the Fixed Asset Schedule and the next ten-year capital improvement costs for the Town, the maximum allowable sewer SDF is \$16.09 per gallon, as shown in **Table 1**.

**Table 1. Maximum Allowable Sewer System Development Fees**

Meter Size, inches	Equivalent Ratio	Sewer Capacity Cost, \$/gallon	Total Capacity Cost, \$/connection <sup>1</sup>
5/8	1.0	\$16.09	\$5,790
1	2.5	\$40.23	\$14,480
1-1/2	5.0	\$80.45	\$28,960
2	8.0	\$128.72	\$46,330
3	16.0	\$257.44	\$92,670
4	25.0	\$402.25	\$144,810
6	50.0	\$804.50	\$289,620
8	80.0	\$1,287.20	\$463,390
10	115.0	\$1,850.35	\$666,120
12	215.0	\$3,459.35	\$1,245,360

<sup>1</sup> Based on 360-GPD use for a 5/8” residential connection.



For a 360-GPD residential (5/8" meter size) connection, the maximum allowable combined sewer SDF would be \$5,790. The unit cost takes into account \$5.3 million in accumulated depreciation for the existing infrastructure assets and non-capacity improvements to existing infrastructure of \$16.0 million, for a net total cost of \$10.7 million and a total Net Replacement Cost New Less Depreciation (RCNLD) cost of \$19.0 million that are potentially eligible to recuperate from SDFs. The unit cost also accounts for \$8.0 million in grant funding for the \$35.9 million in future improvements that may be recuperated with SDFs (refer to **Appendix 4**).

Commercial, institutional, and industrial connections, which require larger meters, may be charged higher SDFs based on American Water Works Association (AWWA) – prescribed equivalent ratios or other approved rate adjustment factors. **Table 1** also shows SDFs for meters ranging in size from 1- to 12-inch. This analysis allows policymakers to make an informed decision when allocating system capacity costs between existing and new customers. It is expected that, at the rates listed in **Table 1**, sewer SDFs will generate a total of \$4.2 million over a five-year planning horizon, to support necessary sewer infrastructure rehabilitation and expansion. The rates listed in **Table 1** represent the maximum rate supported by the SDF analysis. The City can elect to assess lower rates at the City's discretion. As required by the legislation, the City of Locust will need to re-evaluate this analysis and proposed SDFs at a minimum every five years and make necessary fee adjustments.



## 2. INTRODUCTION

### 2.1 Background

The North Carolina General Assembly (NCGA) ratified House Bill 436 (HB 436)<sup>1</sup> in December of 2017, amending Chapter 162A: *Water and Sewer Systems*, Article 8: *System Development Fees* of the NC General Statutes (NCGS)<sup>2</sup>. HB 436 was codified as Session Law (SL) 2018-34. This legislation became effective on July 1, 2018. System development fees (SDFs) for water and sewer systems collected after that date must comply with HB 436/SL 2018-34, as amended. SDFs, also commonly known as capacity charges, are charges imposed to customers (users) to fund capital improvements for new development, to recuperate costs of existing facilities that serve new development, or a combination<sup>3</sup>. According to N.C. General Statute Chapter 162A, Article 8 beginning at section 162A-201, units of local government, authorities, and districts that provide water and sewer services are required to do the following:

- Calculate SDFs by using a buy-in, incremental, or combined costs method;
- Identify assumptions and limitations of the data analysis;
- Identify metric components of the SDF, demand, and capacity by customer class/category;
- Illustrate clear factors for units of measurement;
- Provide a 5- to 20-year planning timeline;
- Provide public notice and conduct a public hearing;
- Adopt fees by resolution or ordinance to incorporate into the jurisdiction’s annual budget; and
- Update and reevaluate the SDFs every five (5) years.

The University of North Carolina at Chapel Hill (UNC) School of Government (SOG) Environmental Finance Center (EFC)<sup>4</sup> and American Water Works Association (AWWA) *Manual of Water Supply Practices*

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<sup>1</sup> North Carolina General Assembly (NCGA). “Public Water and Sewer System Development Fee Act.” *Local Government/Regulatory Fees, House Bill 436*. Session Law 2017-138. Ratified 20 December 2017. [HB 436]

<https://www.ncleg.net/gascripts/billlookup/billlookup.pl?Session=2017&BillID=H436>

<sup>2</sup> North Carolina General Statutes (NCGS). Chapter 162A. *Water and Sewer Systems*.

<https://www.ncleg.net/gascripts/Statutes/StatutesTOC.pl>

<sup>3</sup> NCGA. N.C. General Statute section 162A-207(b).

<https://www.ncleg.net/gascripts/billlookup/billlookup.pl?Session=2017&BillID=H436>

<sup>4</sup> Hughes, Jeff & Millonzi, Kara. (2017, August 17). “Update on the Authority to Charge Water System Development Fees.” [Webinar]. University of North Carolina at Chapel Hill (UNC). School of Government (SOG). Environmental Finance Center (EFC). <https://efc.sog.unc.edu/resource/update-authority-charge-water-system-development-fees>



(M1)<sup>5</sup> provide detailed guidance and considerations for SDF determinations. In general, jurisdictions will need an inventory and condition of assets, financial commitment to capital improvements, and evidence of master planning strategies.

## 2.2 Purpose

The City of Locust, NC has requested The Wooten Company to provide professional consulting services, conduct an in-depth analysis of anticipated sewer system costs, and project estimated revenues from sewer SDFs using the City's existing infrastructure fixed asset schedule and 10-year Capital Improvements Plan (CIP). This analysis will include evaluation of System Development Fee methodologies, investigate the scenario that provides the optimum outcome, present findings, and calculate proposed SDFs for public comment and adoption by the City Council.

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<sup>5</sup> American Water Works Association (AWWA). *Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices (M1)*. 7<sup>th</sup> Edition, 2017.



### 3. METHODOLOGIES OF DETERMINING SYSTEM DEVELOPMENT FEES

System Development Fees (SDFs) are charges to new water and wastewater (sewer) system customers for system capacity. Revenue from these development fees funds capital improvements for new development, recuperates costs of existing facilities that serve new development, or some combination<sup>6</sup>. SDFs do not include routine City administrative or system inspection fees, connection (tap) fees, or ancillary development costs without written agreement regarding credit to the developer. Available methodologies to calculate SDFs are the *Buy-In Method*, *Incremental Cost Method*, and *Combined Method*, as described in more detail below.

#### 3.1 Buy-In Method

The Buy-In Method, otherwise known as the equity method, is appropriate for use when the current system facilities are sufficient to serve existing and future customers or in systems where existing components do not anticipate needing replacement or expansion in the near future. In this approach, the past contributions of existing customers count as built-in equity accrued. New customers contribute equity (buy-in) to the system, relative to the debt-free position of current customers, accounting for their new share of the system cost. In simplest terms, the process of the buy-in method is to:

1. Identify existing capacity of assets;
2. Value that capacity;
3. Calculate a cost per unit of capacity; and
4. Provide conversion units to assign capacity based on customer type and demand.

The costs of facilities are based on system assets and liabilities, equity sources, and usage. Costs of system assets include replacement costs and depreciated value of that asset. System liabilities and equity include outstanding long-term debt, contributions such as grants, and revenues from existing users and customers. A common unit of measurement by type of customer and demand, such as *equivalent residential unit* (ERU), calculates the cost per unit of increased capacity. ERUs are converted to determine the SDF based on meter size (example “base” meter size, 5/8-inch meter), fixture units (number of water-using devices), square footage of property, or number of bedrooms. Revenue from SDFs using the Buy-In

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<sup>6</sup> NCGA. N.C. General Statute section 162A-205.

<https://www.ncleg.net/gascripts/billlookup/billlookup.pl?Session=2017&BillID=H436>





Method must be expended on repair or rehabilitation of system components, as well as previously completed capital improvements activities where capacity still exists for new customers.

### 3.2 Incremental Cost Method

The Incremental Cost Method, or marginal method, is appropriate for use when the current system facilities are sufficient to serve existing customers, but significant upgrades or expansion are required to serve any new customers. The primary concept of this approach is to charge new customers for the new development without existing user rates being adversely affected, but concurrently tackling the debt service associated with the capital improvements.

A primary step in calculating the SDF is determining the service area, such as jurisdictional boundaries or corporate limits. The SDF planning period aligned with projected growth and demand patterns within an existing master plan or Capital Improvements Plan (CIP), with projected growth and demand patterns for a 5- to 20-year lifespan to ensure adequate increase in needed system capacity.

Predicting future system expansion and capacity needs requires the type of customer, demand by customer type, and rate of growth over the planning period. Examples of customer types generally include residential, commercial, institutional, and industrial categories. Growth rates can include population and employment estimates. Just as with the Buy-In Method, a common unit of measurement by customer type or meter size is assigned a utilization rate equivalent to the typical ERU.

According to N.C. General Statute section 162A-207, the Incremental Cost Method must also account for revenue credit, which is a deduction of either the outstanding debt principal or present value of project revenues of the new development over the timeline of the planning period, at a minimum of twenty-five percent (25%) of cost of the capital improvements<sup>7</sup>. Separate construction or contribution credits may also be calculated to determine the excess cost of developer's share of connecting the new development to oversized facilities that accommodate anticipated future development.

System capacity expansion is more efficient and cost-effective when done in an incremental manner. The cost of each increment shifts to the new customers instead of the existing customers of the

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<sup>7</sup> NCGA. N.C. General Statute section 162A-207(b).

<https://www.ncleg.net/gascripts/billlookup/billlookup.pl?Session=2017&BillID=H436>



system. Revenue from collected SDFs covers the costs of constructing new capital improvements and related professional and technical fees to service new customer growth.

### **3.3 Combined Method**

The Combined Method is a combination of the two previous methods. The Buy-In Cost component and Incremental Cost component are added together. This approach is generally appropriate for use when the current system facilities have capacity to serve some of the new growth, but the CIP identifies infrastructure to be constructed to meet the needs of the projected growth. Calculation of SDFs using this method includes both existing and planned capacity.

### **3.4 Overall Technical Approach**

To determine the most appropriate and logical approach to calculate SDFs, the jurisdiction must evaluate its service area priorities and financial objectives:

- Are major expansions anticipated?
- Will new developments solely pay for new capacity?
- What financial reserves exist for capital improvements?
- What is the current debt situation?
- Does current capacity adequately support the needs of the anticipated demand?
- Do current revenues adequately support the needs of the system?
- Are there any system assumptions or limitations?
- What does the local government hope to achieve by charging SDFs? (What is the financial function for SDFs?)
- Besides state legislation and local ordinances, are there any case law(s) applicable to the local system service area?
- Are there any unique criteria important to the jurisdiction or local system service area?

#### **3.4.1 Rational Nexus Test**

A common legal consideration to apply when determining SDFs is the ‘rational nexus test’ to ensure appropriate relationship between the SDF and cost of the new development. The ‘rational nexus test’ requires the following:



- Confirm the direct and reasonable connection between the impact of the new development and need of new or expanded infrastructure (e.g., evaluation of master planning documents);
- Determine the cost of the new infrastructure to support the new development (e.g., evaluating intricacies of how new infrastructure is financed and its economic development contributions); and
- Demonstrate the rationale of appropriating the capital necessary to support that growth (e.g., providing a direct link between the establishment of fair and just fees to the amenities and benefits received by the new users of the new infrastructure).

### 3.4.2 Costs in SDF Calculations

The American Water Works Association (AWWA) *Manual of Water Supply Practices (M1)*<sup>8</sup> provides detailed guidance and considerations for SDF determinations. In general, costs related to existing system assets, estimated capital projects, interest costs, and reclaimed water costs can be included in calculating SDFs. **Table 2** summarizes the typical information needed to calculate the various methods.

**Table 2. Data Needed for SDF Calculations**

Data Needed	Buy-In / Equity Method	Incremental Cost / Marginal Method
Construction/Developer Contribution Credits	X	X
Actual Value of Assets	X	
Replacement Value of Assets	X	
Debt and Grant Credits	X	X
Revenue Credits		X
Existing Asset Inventory	X	
5-20 Year CIP		X
Capacity of Existing Assets	X	
Capacity of Planned CIP Assets		X
Estimated Capacity Needs of Customers based on Demand	X	X

<sup>8</sup> American Water Works Association (AWWA). *Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices (M1)*. 7<sup>th</sup> Edition, 2017.



## 4. EXISTING SEWER SYSTEM CONDITIONS

Utility system components including wastewater collection, treatment and discharge must be identified and their overall condition assessed for adequacy to continue providing services to new customers.

The primary sewer service area is centered around the major transportation roadways in the area, including NC Highway 200 and NC Highway 24. The service area extends to the north towards County Line Road, to the east towards Pond Road, and to the west towards Reed Mine Road (SR 1100). The Locust service area also extends southward until it meets the municipal limits of the Town of Stanfield (refer to the sewer map in **Appendix 1**). As shown in **Table 3**, according to the City’s GIS database, the collection system consists of 9.6 miles of force main, 14.0 miles of vacuum pipe, and 26.4 miles of 8-inch diameter gravity sewer pipe. The wastewater collection system also includes 12 pump stations, 18 buffer tanks, 255 vacuum pits, and 708 manholes. All force mains and gravity sewer are primarily made of polyvinyl chloride (PVC). The City of Locust discharges all its collected sewer to the West Stanly Wastewater Treatment Plant (WWTP), which is owned and operated by Stanly County and located in Oakboro.

Locust does not have an official sewer contract with Stanly County. Based on a review of the peak daily sewer flows over the past three calendar years (2020 – 2022, see **Appendix 2**), the City discharged a maximum of up to 867,588 gallons per day. The City discharges its wastewater into a force main that it shares with the Town of Stanfield, which can carry up to 1 MGD. It is, therefore, reasonable to assume that the City’s collection system is capable of discharging up to 900,000 gallons per day.

**Table 3. Sewer System Components**

Component	#/Design Capacity	Overall Condition
WWTP <sup>1</sup>	0.900 MGD	<i>Satisfactory</i>
Force Main	9.6 miles (10 inch, unknown)	<i>Satisfactory</i>
Pump Stations	12 (60 gpm – 850 gpm)	<i>Satisfactory</i>
Vacuum Pipe	14.0 miles (unknown)	<i>Satisfactory</i>
Buffer Tanks	18	<i>Satisfactory</i>
Vacuum Pits	255	<i>Satisfactory</i>
Gravity Main	26.4 miles, 8 inches	Satisfactory
Manholes	708	Satisfactory

<sup>1</sup> The City of Locust and the Town of Stanfield share a sewer line that sends sewer to Stanly County for treatment. Locust does not have an official sewer contract with Stanly County, so it was assumed the City can send up to 0.900 MGD to the WWTP for treatment, which is the estimated design capacity of the Locust sewer system.



According to 2020 billing information for Locust (refer to **Appendix 2**), the sewer system serves 1,274 residential customers, 123 commercial customers, and 11 institutional customers. In Locust, the typical residential sewer customer has a metered average monthly sewer use of approximately 124 GPD, a typical commercial customer has 497 GPD, and a typical institutional customer has 306 GPD. In total, the City billed its customers for approximately 0.223 MGD in 2020 (based on Locust’s water billings, refer to **Appendix 2**). As described previously, Locust discharges all its collected sewer to Stanly County for treatment. Stanly County then bills Locust for its sewer flow, which is measured via a master meter. All of Locust’s wastewater flow (residential, commercial, industrial, institutional, and I&I) are included in these billed volumes. According to the 2020 sewer billed to the City of Locust by Stanly County (refer to **Appendix 2**), the estimated average daily sewer flow was approximately 0.255 MGD from the customers. Therefore,  $0.255 \text{ MGD} - 0.223 \text{ MGD} = 0.032 \text{ MGD}$  of the flow from Locust is inflow and infiltration (I/I).

Available capacity for the wastewater collection and treatment system is based on meeting the average daily demand. For the sewer system, the treatment demand is met by the treatment capacity provided by Stanly County via their West Stanly WWTP. According to the most recently completed calendar year (2022), Locust discharged an average of 0.275 MGD to Stanly County to be treated. **Table 4** lists available daily capacity for the wastewater system.

**Table 4. Sewer System Available Capacity**

<b>System Capacity Million Gallons Per Day (MGD)</b>	<b>Design Capacity<sup>1</sup></b>	<b>Average Daily Discharge</b>	<b>Available Daily Capacity</b>
Wastewater System	0.900 MGD	0.275 MGD	<b>0.510 MGD</b>

<sup>1</sup> *The City of Locust and the Town of Stanfield share a sewer line that sends sewer to Stanly County for treatment. Locust does not have an official sewer contract with Stanly County, so it was assumed the City can send up to 0.900 MGD to the WWTP for treatment, which is the estimated design capacity of the Locust sewer system.*



## 5. FUTURE CONDITIONS

To determine future capacity, planned sewer system components are identified and prioritized in the service area. Such improvements are typically identified in a 5- to 20-year capital improvements planning (CIP) document adopted by the governing body. The City of Locust has a fixed asset schedule compiled as of June 2022 (refer to **Appendix 3**); assets on this schedule were evaluated for SDF eligibility on the Buy-in Method. Locust updated and provided its 2023-2033 Capital Improvements Plan (CIP), which is included in **Appendix 3**. The updated CIP was utilized to create a list of capital improvement sewer projects for the Year 1 (2023-2024)-to-Year 6 (2027-2028) time period, which were evaluated for potential use in either the Buy-in Method or the Incremental Method. The CIP projects involving improvements to existing infrastructure that **do not** include an expansion of existing capacity will be analyzed under the **Buy-in Method**. However, the CIP projects involving (1) the installation of new infrastructure or (2) improvements to existing infrastructure that **do** include a capacity expansion will be analyzed under the **Incremental Method**. Projects identified for Year 6 (2028-2029) and onward are not included in the SDF analysis, as the analysis period for the SDF evaluation is a five-year time frame.

### 5.1 Improvements to Existing Systems

#### 5.1.1 Existing Assets

Capital improvements to the existing wastewater system are necessary to ensure continued reliable operation. System Development Fees (SDFs) may be charged based on existing asset values if excess capacity is available and after the assets have been depreciated to provide a proper current value. In this way, the SDFs can be charged to account for the remaining portion of the assets' useful service life. Currently, the City annually straight-line depreciates its sewer assets based on expected service life. Depreciation is not accounted for in the user charges of existing sewer customers. The Wooten Company evaluated the existing fixed asset schedule and 2023-2033 CIP to determine projects to be used in the **Buy-In Method** (refer to **Appendix 3**).

The fixed asset schedule includes 66 projects to be reviewed. Depreciation was provided on the depreciation schedule (refer to the schedule in **Appendix 3**). Out of the 66 assets considered, 10 of these projects are fully depreciated, leaving 56 assets to be considered. In addition, eight of these projects were eliminated as these assets were unrelated to sewer utilities (e.g., vehicles, equipment, computers,



aluminum roofs, etc.), leaving only 48 assets from the fixed asset schedule to be analyzed under the Buy-in Method (these assets are highlighted in yellow on the schedule in **Appendix 3**).

### 5.1.2 Future Projects

To evaluate planned projects applicable to the **Buy-in or Incremental Cost Methods**, the City's updated 2023-2033 Capital Improvements Plan (CIP)<sup>9</sup> was examined (refer to **Appendix 3**). The CIP specifically identifies improvements to the existing utility systems, including the necessary utility transmission extensions and expansions to meet future demands. The projects on the CIP up to and including Year 5 (2027-2028) were evaluated in regards to the percentage of the project that could potentially serve future users. Projects from Year 6 (2028-2029) and onward in the CIP were excluded from this SDF analysis, because the costs are incurred outside of the five-year SDF analysis period. Furthermore, any CIP projects that involve items that are typical operation and maintenance (e.g., pump overhauls, sewer line point repairs), isolation valves, SCADA systems, miscellaneous equipment, or are unrelated to sewer utilities (e.g., new service truck) are considered ineligible for SDFs and thus were not analyzed as part of the Incremental Cost Method.

In total, eight of the 15 projects identified in the 2023-2033 CIP were included in the SDF worksheets (these assets are highlighted in yellow on the CIP in **Appendix 3**). The results of this evaluation for each project are listed below:

- **CIP Asset S-1: West Stanly WWTP Phase II Expansion and Force Main Improvements.** The purpose of project is to expand the West Stanly WWTP from 1.2 MGD to 2.5 MGD. The West Stanly WWTP receives wastewater flow from the City of Locust, the Town of Oakboro, the Town of Red Cross, and the Town of Stanfield. All of these communities are charged sewer rates by Stanly County. Each of these communities will charge their own SDF charges. The total project cost opinion for this project is \$30.7 million. The County obtained \$6.5 million in grant funding from the federal government's America Rescue Plan Act (ARPA) Fund to fund a portion of this project. This project is accounted for in Locust's CIP; however, to be consistent with SDF calculations performed for the other communities serviced by the West Stanly WWTP (Oakboro, Stanfield, and Stanly County), the full \$30.7 million was analyzed. Because this is a project that involves a capacity expansion, it will be analyzed under the **Incremental Method**. According to the County, there is currently 0.352 MGD of existing capacity left

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<sup>9</sup> City of Locust, NC. 2023-2033 Capital Improvements Plan (CIP).



for the existing 1.2-MGD WWTP. Adding the 1.3 MGD in available capacity that will be gained from the Phase II expansion results in a total of 1.652 MGD in capacity available for future development. Based on this available future capacity, this project is considered **66% SDF eligible** (calculated as 1.652 MGD/2.5 MGD). As discussed in Section 6.3, a 25% minimum SDF credit is applied to this item under the Incremental Method.

- **CIP Asset S-2: Browns Hill Vacuum Station Improvements.** There are many features of the Browns Hill Vacuum Station that are outdated or at the end of their life. The purpose of this project is to bring the station up to date and extend the life of the equipment. The project includes improvements such as installing VFDs and updating the station’s electrical system. The total project cost is conservatively anticipated to cost \$70,000 distributed over the 2026-2033 time period (i.e., \$10,000 per year). Because this is a project that involves non-capacity-increase improvements to existing infrastructure, it will be analyzed under the **Buy-in Method**.
- **CIP Assets S-3 through S-5:** These projects are called the “Creekview Lift Station Improvements”, the “Elm Street Lift Station Improvements”, and “Hwy 200N Lift Station Improvements”. The total project costs for these projects are conservatively anticipated to cost approximately \$2.3 million, \$1.3 million, and \$1.6 million, respectively, for a total of approximately \$5.2 million. All of these costs will be distributed over the 2023-2033 time period (i.e., \$225,785 per year for Creekview, \$131,824 per year for Elm Street, and \$163,598 per year for Hwy 200N, respectively). The City of Locust intends to use funds it gained from the America Rescue Plan Act (ARPA) to pay for **CIP Assets S-3, S-4, and S-5**. The total grant funding for these projects is \$1.3 million (Project #SRP-W-ARP-0060). All ARPA funds must be spent within the first five years of the grant being awarded. For the purposes of this analysis, the grant funding was distributed according to the magnitude of costs of each project. For example, for the “Creekview Lift Station Improvements”, it was estimated that approximately  $(\$1.3 \text{ million grant} \times \$2.3 \text{ million} / \$5.2 \text{ million}) = \$563,000$  in grant money will be used to fund this project. The specifics of each asset are detailed below:
  - **CIP Asset S-3: Creekview Lift Station Improvements (i.e., Creekview Basin Improvements).** The Creekview Basin improvements involve expanding the Creekview Lift Station and diverting flow from the nearby existing vacuum sewers to a new system of force mains and gravity sewers. Diverting flows away from the vacuum sewer system will allow the Town to recoup some capacity in the vacuum sewers. Through the new series of force mains and gravity sewers, flows from the Creekview Lift Station will be transported to the Elm Street Lift Station. The total cost is





approximately \$2.3 million, with about \$563,000 in grant funds being utilized to pay for this project. Because this is a project that involves a capacity expansion, it will be analyzed under the **Incremental Method**. The Creekview Lift Station will be expanded from a capacity of 298 gpm to a capacity of 500 gpm (i.e., 0.720 MGD). This means that the station will have 500 gpm – 298 gpm = 202 gpm in capacity for future sewer customers. Therefore, this project is **40% SDF eligible**. As discussed in Section 6.3, a 25% minimum SDF credit is applied to this item under the Incremental Method.

- **CIP Asset S-4: Elm Street Lift Station Improvements (i.e., East Basin Improvements).** The East Basin improvements involve expanding the Elm Street Lift Station and upsizing its 8-inch force main to a 10-inch force main, so that it can receive increased flows from the Creekview Lift Station. The total cost is approximately \$1.3 million, with about \$329,000 in grant funds being utilized to pay for this project. Because this is a project that involves a capacity expansion, it will be analyzed under the **Incremental Method**. The Elm Street Lift Station will be expanded from a capacity of 850 gpm to a capacity of 1,211 gpm (1.744 MGD). This means that the station will have 1,211 gpm – 850 gpm = 316 gpm in capacity for future sewer customers. Therefore, this project is **30% SDF eligible**. As discussed in Section 6.3, a 25% minimum SDF credit is applied to this item under the Incremental Method.
- **CIP Asset S-5: Hwy 200N Lift Station Improvements (i.e., North Basin Improvements).** The North Basin improvements involve expanding the Hwy 200N Lift Station and installing a parallel 10-inch force main, so that it can handle increased flows. The total cost is approximately \$1.6 million, with about \$408,000 in grant funds being utilized to pay for this project. Because this is a project that involves a capacity expansion, it will be analyzed under the **Incremental Method**. The Hwy 200N Lift Station will be expanded from a capacity of 227 gpm to a capacity of 381 gpm (0.549 MGD). This means that the station will have 381 gpm – 227 gpm = 154 gpm in capacity for future sewer customers. Therefore, this project is **40% SDF eligible**. As discussed in Section 6.3, a 25% minimum SDF credit is applied to this item under the Incremental Method.
- **CIP Asset S-6: Meadow Creek Lift Station Conversion.** The Meadow Creek Lift Station is a dual-functioning station, operating as both a gravity pump station and a vacuum lift station. The station is currently operating as two separate stations, with the pumps on the gravity side and on the vacuum side competing with each other for the flow. The purpose of this project is to upgrade it so that station operates as one station rather than two stations competing against each other. This will recoup some of the lost capacity of the station, as the pumps will be able to operate up to their maximum capacity



after these improvements are made. The total project cost is conservatively anticipated to cost \$500,000 distributed over the 2026-2033 time period (i.e., \$50,000 per year). Because this is a project that involves non-capacity-increase improvements to existing infrastructure, it will be analyzed under the **Buy-in Method**.

- **CIP Asset S-7: Meadow Creek Lift Station Improvements.** Like the Browns Hill Vacuum Station, there are many features of the vacuum side of the Meadows Creek Lift Station that are outdated or at the end of their life. The purpose of this project is to bring the station up to date and extend the life of the equipment. Such improvements include replacing the electrical panel. The total project cost is conservatively anticipated to cost \$250,000 distributed over the 2026-2033 time period (i.e., \$25,000 per year). Because this is a project that involves non-capacity-increase improvements to existing infrastructure, it will be analyzed under the **Buy-in Method**.
- **CIP Asset S-8: Walmart Lift Station Improvements.** The Walmart Lift Station is gravity-fed pump station that utilizes grinder pumps. Its existing pumps are not conducive and are to be upgraded to non-clog, submersible pumps. Other various improvements will be made to the station as part of this project, including but not limited to a new electrical system. The total project cost is conservatively anticipated to cost \$100,000 distributed over the 2026-2033 time period (i.e., \$10,000 per year). Because this is a project that involves non-capacity-increase improvements to existing infrastructure, it will be analyzed under the **Buy-in Method**.

In total, from the CIP, four projects will be analyzed under the Buy-in Method and the remaining four of the projects will be analyzed under the Incremental Method.

## 5.2 Future Demand

The future sewer demands are projected five years forward through 2028 to gauge the need for improvements during the five-year planning period. Based on historic population trends in the US Census data, Locust population increased from 2,930 persons in 2010 to 4,537 persons in 2020. This increase of 1,607 persons is equivalent to an annual residential growth rate of about 5.50%. The North Carolina State Data Center projects that Stanly County will experience population growth at a rate of about 0.31% annually. However, recent development activity and discussions with County Staff indicate higher growth rates are expected for the City of Locust than is indicated by the County growth. Locust grew by 1,607 people from 2010 to 2020, but most of that growth occurred within the last couple of years. According to the U.S. Census, the 2018 population was 3,351 people and the 2020 population was 4,537 people



(~18%/year increase). As a comparative analysis, historical US Census data were also reviewed for the municipalities located to the south and west of the West Stanly WWTP service area, primarily within Western Union County and Cabarrus County. The fastest growing municipality in the area is Harrisburg, which has experienced a 5.3% growth rate over the last few years. The growth experienced in western Union County, specifically in the Charlotte area, is predicted to spread into the West Stanly County area. Locust is closest to the Charlotte growth center and is planning for such growth, having received consistent developer requests for more sewer service in the last several years. Because of this, Stanly County Staff and City of Locust staff estimate a 4% to 5% annual growth rate for the City of Locust for the near future. Therefore, it is reasonable to estimate future population growth in Locust to be approximately 5% for the next five years. These developments are expected to begin within the next five years, but their size and the number of phases for each development will mean the completion of the developments will likely be spread out over the next 15 years. To be conservative, these developments are expected to occur as a result of that 5% annual growth rate.

Using a 5% annual growth rate and a 2020 population of 4,537 people, the projected 2028 service population for Locust is estimated to be 6,352 people (1,815 additional people). **Table 5** shows the projected number of sewer future connections for the City during the 2020-2028 period assuming the number of connections increase in the same proportion as the population.

**Table 5. Number of Projected Sewer Connections**

<b>SEWER CONNECTIONS</b>	<i>Existing (2020)</i>	<i>Future (2028)</i>
Residential	1,274	1,784
Commercial	123	172
Industrial	11	15
Institutional	0	0
<b>TOTAL SEWER</b>	<b>1,408</b>	<b>1,971</b>

According to calculation guidelines from state administrative code and statutes<sup>10,11,12</sup>, increases in population and sewer demands are anticipated with the additional connections in **Table 5**. Projected

<sup>10</sup> North Carolina Administrative Code (NCAC). 15A NCAC 02T. *Waste Not Discharged to Surface Waters*.

<http://reports.oah.state.nc.us/ncac.asp?folderName=\Title%2015A%20-%20Environmental%20Quality\Chapter%2018%20-%20Environmental%20Health>

<sup>11</sup> NCAC. 15A NCAC 18C .0409. *Service Connections*. <http://reports.oah.state.nc.us/ncac.asp?folderName=\Title%2015A%20-%20Environmental%20Quality\Chapter%2018%20-%20Environmental%20Health>

<sup>12</sup> NCGS. Chapter 162A. *Water and Sewer Systems*. <https://www.ncleg.net/gascripts/Statutes/StatutesTOC.pl>



sewer demands are based on the existing average sewer flow and the estimated I/I flow as determined in Section 4 and then adding the new customers from **Table 5** (for 2028). For future demands, state guidelines were used for future residential demands and non-residential demands were based on 2020 sewer billing data.

**Table 6** provides estimated sewer demands based on existing average daily demand for the residential, commercial, institutional, and industrial customer categories and projected demand per connection for future customers. As stated in Section 4.2, the City billed its customers for approximately 0.223 MGD (not including I/I flow) in 2020. For this calculation, it is assumed the volume of I/I in 2020 (0.032 MGD) remains constant for the next five years. New residential wastewater flows are based on State statutes while new commercial, institutional, and industrial design flows are assumed to be equivalent to what they are currently according to 2020 sewer billings. The 2028 Average Daily Flow (ADF) estimates result in a total ADF of 0.464 MGD. As stated previously in Section 4, while the City of Locust does not have its own sewer treatment contract with Stanly County, it discharges into the same 1-MGD capacity sewer line that the Town of Stanfield does. The estimated design capacity of the Locust sewer system is 0.900. Therefore, the 2028 ADF does not exceed the capacity of the Locust sewer system.

**Table 6. Estimated Sewer Demand, 2028**

Expanded Service Area Customer Type	Quantity	Design Flow (gallons per unit per day)	Average Daily Design Flow (MGD)
Existing Base Wastewater Flow	---	---	0.223
New Residential	510	360	0.184
New Commercial	49	500	0.025
New Institutional	4	310	0.001
New Industrial	0	0	0.000
		<b>ADF Billable</b>	<b>0.432</b>
		<b>I/I ADF</b>	<b>0.032</b>
		<b>ADF Total</b>	<b>0.464</b>

### 5.3 Assumptions & Limitations

The projected 2028 wastewater demand is subject to change, given the developmental pace of the City of Locust. The intent of the capacity discussion above was to demonstrate the future sewer demands required of Stanly County to sufficiently handle the projected population of Locust within the five-year planning period of the SDF analysis.



## 5.4 Sewer System Future Improvements

Future improvements for the wastewater collection system to serve future growth within the five-year SDF planning period were identified. These improvements include: the Phase II expansion to the West Stanly WWTP; upgrades to the Meadow Creek and Browns Hill Lift Stations; expansion of the Creekview, Elm Street, and Hwy 200N Lift Stations; and upgrades to the Walmart Lift Station. These projects will take place over the next ten years, but the cost of the projects outside the five-year planning period were excluded from this analysis.

## 5.5 Methodology Selection

Remaining capacity exists within the wastewater system to serve near term growth within Locust. Debt service was incurred for capital improvements that continue to serve existing and future development. Because the depreciated assets identified in Section 5.1.1 can serve future population growth without expansion, their remaining non-depreciated value is appropriate to recover using the Buy-in Cost Methodology.

Likewise, projects identified in Section 5.1.2 are associated with projects required that are needed to service future growth. The Incremental Cost Methodology is appropriate to charge new development for the increased capacity to serve it. For example, the costs for the additional capacity related to wastewater collection and treatment to extend service to future developments should be borne by the new development being served.

Therefore, the **Combined Cost Method**, employing both the Buy-in Cost Methodology and Incremental Cost Methodology, is appropriate for the City of Locust to assess Sewer System Development Fees.



## 6. ANALYSIS OF SYSTEM DEVELOPMENT FEES

The **Buy-In (Equity) Cost Method** is appropriate when the existing system facilities are sufficient to service existing and new customers. The primary concept of this approach is to charge new customers for their equitable share of an asset with remaining service life. The **Incremental Cost (Marginal) Method** is appropriate when the existing system facilities are sufficient to serve existing customers, but significant upgrades or expansion are required to serve any new customers. The primary concept of this approach is to charge new customers for the new development without adversely affecting user rates for the existing customers. Locust has need for both methodologies; therefore, the **Combined Cost Method** is appropriate. The full tables for the SDF Combined Cost Method are presented in **Appendix 4**.

### 6.1 Buy-In Component for Existing Facilities

The evaluation described in Section 5.1 provided a listing of projects that are potentially eligible to be included in the SDF Buy-in analysis. The 48 assets identified from the fixed schedule and the four projects from the CIP were analyzed under the Buy-in Method, for total of 52 assets, as shown in the Buy-In SDF worksheets in **Appendix 4**. At this point, The Wooten Company performed additional evaluation to determine the current net project cost after depreciation. Depreciation was provided on the fixed asset schedule (refer to the schedule in **Appendix 3**). Those projects to be completed in the future under the CIP also had zero depreciation.

Assets were further excluded from eligibility for SDFs if (1) the asset was minor infrastructure or equipment (i.e., SCADA, manholes), (2) the asset was fully grant funded, or (3) the specific asset is not of sufficient size to serve additional future users (such as sewers or pump stations serving a limited geographic area). The results of the asset evaluation are listed below:

- Based on a total of 52 assets identified, the original asset value of \$16.0 million for these assets was reduced by accumulated depreciation to date of \$5.3 million; to yield a total net asset value of \$10.7 million.
- The preferred AWWA valuation approach is “replacement cost new less depreciation” (RCNLD). This approach is based on the premise that System Development Fees should reflect the value of providing any given amount of new capacity at the cost of constructing the assets at the time the new customer is connected. This fairly compensates existing customers for carrying the costs of constructing and maintaining capacity built into the system in advance of when the new customers connect.



Replacement cost in the RCNLD calculation used the RS Means CCI (Construction Cost Index). RS Means has been publishing CCI for over 70 years, collecting data from all facets of the industry to accurately track costs directly related to building and construction. This allows the present value (replacement cost new) of capital construction projects to be calculated on data provided by a very reliable, long-time industry leader. Depreciation assigned by the City's fixed asset inventory uses the straight-line method, typically based on a 50-year assignment of useful life, to represent a general decline in value over time. Replacement Cost New (RCN) is therefore determined by applying the RS Means index to the original cost, then deducting the accumulated depreciation to reach RCNLD. The total Net RCNLD cost is approximately \$19.0 million.

- Of the 52 existing assets, four (4) assets were ineligible because the assets supported only a small portion of the City (e.g., sewers only serve the nearby Bojangles). Eight (8) additional assets were ineligible because the costs were for manholes, SCADA updates, or monitoring equipment.

In summation, 40 assets are eligible for SDFs. These assets include previous gravity sewer extensions, buffer tank, equipment purchases for the Clearwater and Covalen construction projects, replacement of pumps at Meadow Creek Lift Station, analysis and design costs for the North Basin Improvements, other pump replacements, and Redah Pump Station improvements. These assets also include the West Stanly WWTP Phase II Expansion and Force Main Improvements, Browns Hill Vacuum Station Improvements, Creekview Lift Station Improvements, Elm Street Lift Station Improvements, Hwy 200N Lift Station Improvements, Meadow Creek Lift Station Conversion, Meadow Creek Lift Station Improvements, and Walmart Lift Station Improvements. The SDF eligible projects are highlighted in bold on the SDF Buy-in Methodology Table in **Appendix 4**.

The 40 assets eligible for SDFs were then grouped into 19 categories, as listed in **Table 7**. Sewer line extensions that are eligible for SDFs (i.e., 8" extensions, the Chicago Tube and Iron Project, the UPT Sewer Project, and Kings Heights / Sherwood Park sewer project) were separated out from sewer line extensions that are ineligible for SDFs (i.e., Water and Sewer Lines, the Bojangles Sewer Project, and the Villages of Redbridge sewer project). Costs for the Buffer Tank, the equipment purchases for the Clearwater and Covalen construction projects, and the engineering fees associated with the Harry Dail project were each given their own category. All costs associated with manhole improvements, such as repairs and rehabilitations, were sorted into one category and considered not eligible for SDFs. Costs associated with replacing pumps at the Meadow Creek Lift Station were sorted into a different category.



**Table 7. Sewer System Buy-In Valuation**

Group Asset ID	Total Costs, \$	Total Credits, \$	Net Total Cost, \$	RCNLD, \$	SDF Eligible?	Eligible RCNLD, \$
Sewer Line Extensions, eligible (Assets 4, 7 - 15, 18, 19, 24, & 27)	5,330,829	[1,514,312]	3,816,517	6,329,812	Yes	6,329,812
Sewer Lines Extensions, ineligible (Assets 2, 21, & 22)	8,058,213	[3,634,904]	4,423,309	9,879,117	No	0
Buffer Tank (Asset 31)	9,258	[4,938]	4,320	5,715	Yes	5,715
Construction - Clearwater, Inc. (Asset 25)	2,111	[338]	1,773	2,419	Yes	2,419
Construction - Covalen (Asset 26)	1,900	[304]	1,596	2,245	Yes	2,245
Engineering Fees - Harry Dail (Assets 6)	175,000	[70,000]	105,000	229,258	No	0
Manholes (Assets 33 & 35)	34,598	[6,689]	27,909	36,917	No	0
Meadow Creek LS Pumps (Assets 60-64)	109,304	[2,504]	106,800	106,800	Yes	106,800
North Basin Improvements, Analysis & Design (Assets 32, 34, 37, 38, 50, 55, 65, & 66)	220,426	[74]	220,352	264,402	Yes	264,402
Pump Replacement (Asset 36 & 41)	11,183	[2,744]	8,439	10,553	Yes	10,553
Redah PS Improvements (Assets 43, 44, 49, & 54)	1,030,261	[25,757]	1,004,505	1,166,672	Yes	1,166,672
SCADA/Monitoring Systems at Stations (Assets 48, 51, & 56 – 59)	77,197	[8,681]	68,516	79,929	No	0
Browns Hill Vacuum Station Improvements (CIP Asset S-2)	70,000	[0]	70,000	70,000	Yes	70,000
Meadow Creek Lift Station Improvements (CIP Assets S-6 & S-7)	750,000	[0]	750,000	750,000	Yes	750,000
Walmart Lift Station Improvements (CIP Asset S-8)	100,000	[0]	100,000	100,000	Yes	100,000
<b>TOTAL SDF-ELIGIBLE NET COST</b>						<b>8,808,618</b>
Sewer System Design Capacity, MGD =						0.900
<b>TOTAL SEWER COST/GALLON CAPACITY</b>						<b>9.79</b>





All costs associated with the North Basin Improvements project, including the cost for the analysis that led to the creation of the project and the design of the project, were sorted into one category. Pump replacements were separated into their own category. Costs associated with the improvements to the Redah Pump Station were sorted into another category. Costs associated with SCADA updates and monitoring equipment were given their own category. Costs for the Browns Hill Vacuum Station Improvements and Walmart Lift Station Improvements projects were each given their own category. Lastly, the costs for the Meadow Creek Lift Station Conversion and Meadow Creek Lift Station Improvements projects were combined into one project.

The total adjusted RCNLD for the listed assets was converted to a unit cost of capacity by dividing the RCNLD value by the total estimated capacity of the sewer system. As stated previously, the City does not own any reserved capacity in the West Stanly WWTP. However, based on a review of the peak daily sewer flows over the past three calendar years (2020 – 2022, see **Appendix 2**), the City discharged a maximum of up to 867,588 gallons per day. It is, therefore, reasonable to assume that the City’s collection system is capable of discharging up to 900,000 gallons per day. With a net total RCNLD of \$8.8 million eligible for SDFs, the total sewer cost per gallon of capacity for the Buy-in Method is \$9.79.

## 6.2 Incremental Component for Future Facilities

Future capacity related assets for the sewer system shown in **Table 8** are included in the City’s CIP (refer to Section 5.1.2). Based on the analysis detailed in Section 5.1.2, only four were analyzed under the Incremental Method: the West Stanly WWTP Phase II 2.5-MGD Expansion (**CIP Asset S-1**), the Creekview Basin improvements (**CIP Asset S-3**), the East Basin improvements (**CIP Asset S-4**), and the North Basin improvements (**CIP Asset S-5**). The Creekview Basin, East Basin, and North Basin improvements will all be funded with a \$1.3-million grant provided by ARPA. Grants awarded by ARPA must be fully spent within the first five years. For this analysis, the \$1.3 million was distributed according to the magnitude of costs for each project. Dividing the net total cost of \$28.1 million by the incremental increase in capacities yields a total sewer cost per gallon capacity of \$6.30.



**Table 8. Sewer System Incremental Valuation**

<b>CIP Project Description</b>	<b>Total Costs, \$</b>	<b>Total Credits, \$</b>	<b>Net Total Cost, \$</b>	<b>Capacity, MGD</b>	<b>% Credit<sup>1</sup></b>	<b>% SDF Eligible</b>	<b>Net Total Cost per Gal Capacity, \$/GPD</b>
West Stanly WWTP Phase II Expansion and Force Main Improvements (CIP Asset S-1)	30,700,000	[6,500,000]	24,200,000	1.375	25%	66%	4.79
Creekview Lift Station Improvements (CIP Asset S-3)	2,257,850	[563,156]	1,694,694	0.720	25%	40%	0.71
Elm Street Lift Station Improvements (CIP Asset S-4)	1,318,235	[328,796]	989,439	1.744	25%	30%	0.13
Hwy 200N Lift Station Improvements (CIP Asset S-5)	1,635,975	[408,047]	1,227,928	0.549	25%	40%	0.67
<b>TOTAL SEWER COST/GALLON CAPACITY</b>							<b>6.30</b>

<sup>1</sup> Includes minimum 25% credit per N.C. General Statute section 162A-207(b).



### 6.3 Valuation Adjustments

N.C. General Statute section 162A-207(b) specifies that a minimum 25% credit be applied towards the calculated incremental cost per gallon capacity. This credit assumes that existing retail user rates and charges will generate at least 25% of the present worth capital costs through the five-year planning period necessary to construct new infrastructure. To avoid collecting revenues twice (first through the SDF, and secondly through retail sewer rates), credits were applied to the incremental costs calculated in **Table 8** above.

Note this credit adjustment is different from specific credits given to an individual developer for constructing infrastructure *above and beyond* its proportionate share to service anticipated future connections. These additional credits may be applied by the City to individual developers on a case-by-case basis.

Adding the buy-in cost to the incremental cost yields a combined cost per gallon of capacity, as shown in **Table 9**. The combined sewer cost is \$16.09 per gallon.

**Table 9. Combined Cost Valuation**

Buy-In Cost per Gallon, \$	9.79
Incremental Cost per Gallon, \$	6.30
Combined Cost per Gallon, \$	16.09

### 6.4 Cost per Unit of Volume

The maximum-allowable combined cost of \$16.09 per one-gallon capacity of sewer serves as the basis for adjusting the fees for different customer classes. Using an equivalent ratio recommended by *AWWA Manual M1*, increased operational demands on the sewer system for larger customers are calculated to produce higher SDFs.

In this analysis, meter sizes are utilized to estimate how much water/sewer the new customer can be expected to use. The equivalent ratio for larger meters represents the higher demand of larger customers, computed using the 5/8-inch meter as a base unit. The ratio is representative of the maximum safe operating flow through the meter as compared to a residential meter. **Table 10** calculates the sewer capacity costs for larger meter sizes using the equivalent ratios.



As an alternative to equivalent meter ratios, which are conservative by nature, the City may also consider charging non-residential (i.e., commercial, institutional, and industrial) customers based on estimated water consumption, number of plumbing fixture units, or other special considerations that may affect sewer demand.

Given that a residential customer consumes 360 gallons per day (GPD) per NCDEQ, the sewer capacity costs from **Table 9** are converted into typical ‘per connection’ fees for the various water meter sizes, using the same equivalent ratios. These typical ‘per connection’ costs, illustrated in **Table 10**, are the basis for the annual revenue forecasts in Section 7.0. For example, a residential customer with a 5/8” water meter may be charged a maximum-allowable sewer system development fee of \$5,790 for sewer service.

**Table 10. Maximum Allowable Capacity Cost Per Equivalent Connection**

Meter Size, inches	Equivalent Ratio	Sewer Capacity Cost, \$/connection
5/8	1.0	\$5,790
1	2.5	\$14,480
1-1/2	5.0	\$28,960
2	8.0	\$46,330
3	15.0	\$92,670
4	25.0	\$144,810
6	50.0	\$289,620
8	80.0	\$463,390
10	115.0	\$666,120
12	215.0	\$1,245,360

<sup>1</sup> Based on 360-GPD use for a 5/8” residential connection.



## 7. APPLICATION OF SYSTEM DEVELOPMENT FEES

According to Article 8 (System Development Fees) of the NC General Statutes<sup>13</sup>, SDFs are collected for subdivisions of land at the time of plat recording, or when the unit of local government commits water or sewer service for the new development. For un-subdivided land, the SDF applies when the individual customer applies to connect to the system. Additional guidance for fee collection was released in the spring of 2021.

A projection of sewer customer connections in the five-year SDF planning period (2023 to 2028) is provided in **Table 11**. This projection is based on the projected population in Section 5.2 and **Table 5**. Note the existing City’s metered connections were projected with a 5% annual growth rate.

**Table 11. Projected Cumulative Sewer Customers, 2028**

Year	Residential	Commercial	Institutional	Industrial
2020	1,274	123	11	0
2021	1,338	129	12	0
2022	1,405	136	12	0
2023	1,475	142	13	0
2024	1,549	150	13	0
2025	1,626	157	14	0
2026	1,707	165	15	0
2027	1,793	173	15	0
2028	1,882	182	16	0

Capacity costs per connection in **Table 10** multiplied by the annual customer growth projections in **Table 11** result in the estimated annual revenues – that is, revenue projections from sewer SDFs – for the five-year planning period as shown in **Table 12**. Revenues assume that the typical residential customer will have a 5/8” water meter, commercial customers a 1-1/2” water meter, institutional customers a 4 compound water meter, and industrial customers a 1-1/2” water meter. The full revenue calculations, which are summarized in **Table 12**, are presented in **Appendix 4**.

Estimated SDF sewer revenues for the next five-year planning period are approximately \$4.2 million from new residential and non-residential growth. *If the City elects to charge SDFs on a per gallon*

<sup>13</sup> NCGS. Chapter 162A. *Water and Sewer Systems*. <https://www.ncleg.net/gascripts/Statutes/StatutesTOC.pl>



basis instead of an equivalent meter basis, the projected SDFs will likely be less than what it shown in **Table 12**.

**Table 12. Estimated Sewer Revenues, 2028**

<b>Year</b>	<b>Residential (5/8")</b>	<b>Commercial (1.5")</b>	<b>Institutional (4 compound)</b>	<b>Industrial (1.5")</b>	<b>TOTAL SEWER SDF REVENUE</b>
2024	\$428,638	\$202,734	\$144,810	\$0	<b>\$776,182</b>
2025	\$446,015	\$202,734	\$144,810	\$0	<b>\$793,559</b>
2026	\$469,184	\$231,696	\$144,810	\$0	<b>\$845,690</b>
2027	\$492,354	\$231,696	\$144,810	\$0	<b>\$868,860</b>
2028	\$521,316	\$260,658	\$144,810	\$0	<b>\$926,784</b>
<b>TOTAL</b>	<b>\$2,357,507</b>	<b>\$1,129,518</b>	<b>\$724,050</b>	<b>\$0</b>	<b>\$4,211,075</b>

The foregoing revenue projections intend to provide a gauge of anticipated income based on the assessment of the maximum-allowable SDFs. The projections are highly dependent on the City’s assigned land uses and zoning, which will influence the future development type and associated sewer demands. After projects in the CIP are better defined and planning costs refined, the revenue projections may be re-evaluated and adjusted accordingly.



## 8. CONCLUSIONS & RECOMMENDATIONS

The Wooten Company has calculated maximum allowable sewer System Development Fees (SDFs) on a 'per gallon' basis and 'per connection' basis for new development within the City of Locust service area. These fees may be assessed by Locust at a lower rate but cannot exceed the calculated figures for a five-year SDF analysis period. The calculated combined sewer cost is \$16.09 per gallon capacity.

Locust has existing sewer assets with available capacity and useful life to serve both existing and new customers, as well as major sewer capacity expansion needs on the horizon. Therefore, the SDFs are based on the Combined Cost methodology, a combination of Buy-In (Equity) and Incremental (Marginal) Cost methodologies. Application of the 'rational nexus test' to the calculated SDFs for Locust demonstrates that:

- There is a direct and reasonable connection between the impact of the new development and need for new or expanded infrastructure;
- \$4.2 million may be collected in the next five years through adoption of SDFs; and
- Appropriation of capital funds necessary to support that growth can be achieved through collection of SDFs using a combined cost approach so that new development customers are afforded the same level of service as existing utilities customers.

Based on the calculated capacity costs per gallon and per connection, **Table 13** summarizes the maximum allowable SDFs for the connection of new sewer customers using meter size to determine the equivalent ratio for non-residential customers.



**Table 13. Maximum Allowable Sewer System Development Fees**

Meter Size, inches	Equivalent Ratio	Sewer Capacity Cost, \$/gallon	Total Capacity Cost, \$/connection <sup>1</sup>
5/8	1.0	\$16.09	\$5,790
1	2.5	\$40.23	\$14,480
1-1/2	5.0	\$80.45	\$28,960
2	8.0	\$128.72	\$46,330
3	16.0	\$257.44	\$92,670
4	25.0	\$402.25	\$144,810
6	50.0	\$804.50	\$289,620
8	80.0	\$1,287.20	\$463,390
10	115.0	\$1,850.35	\$666,120
12	215.0	\$3,459.35	\$1,245,360

<sup>1</sup> Based on 360-GPD use for a 5/8" residential connection.

It is expected that the SDFs will generate approximately \$4.2 million for sewer improvements (refer to **Table 12**) over the next five years to support necessary rehabilitation and upgrades. In accordance with HB 436/SL 2018-34, this analysis provides information to the public and Locust policymakers to assign system development fees to customers, with re-evaluation occurring at least every five years.

The Town has previously set the unit costs per residential sewer connection at \$2,500. **Table 14** summarizes the resulting SDFs, estimated based on the \$2,500 per residential connection fee. Adoption of these SDFs would reduce the total revenue generated over the next five years by about \$2.4 million.

**Table 14. Locust's Currently Adopted Sewer System Development Fees**

Meter Size, inches	Equivalent Ratio	Sewer Capacity Cost, \$/gallon	Total Capacity Cost, \$/connection <sup>1</sup>
5/8 or 3/4	1.0	\$6.95	\$2,500
1	2.5	\$17.38	\$6,250
1-1/2	5.0	\$34.75	\$12,510
2	8.0	\$55.60	\$20,010
3	16.0	\$111.20	\$40,030
4	25.0	\$173.75	\$62,550
6	50.0	\$347.50	\$125,100
8	80.0	\$556.00	\$200,160
10	115.0	\$799.25	\$287,730
12	215.0	\$1,494.25	\$537,930

<sup>1</sup> Based on 360-GPD use for a 5/8" residential connection.





## **APPENDIX 1**

### **Locust Sewer System Map**



# Town of Locust Sewer System

March 2023

### Legend

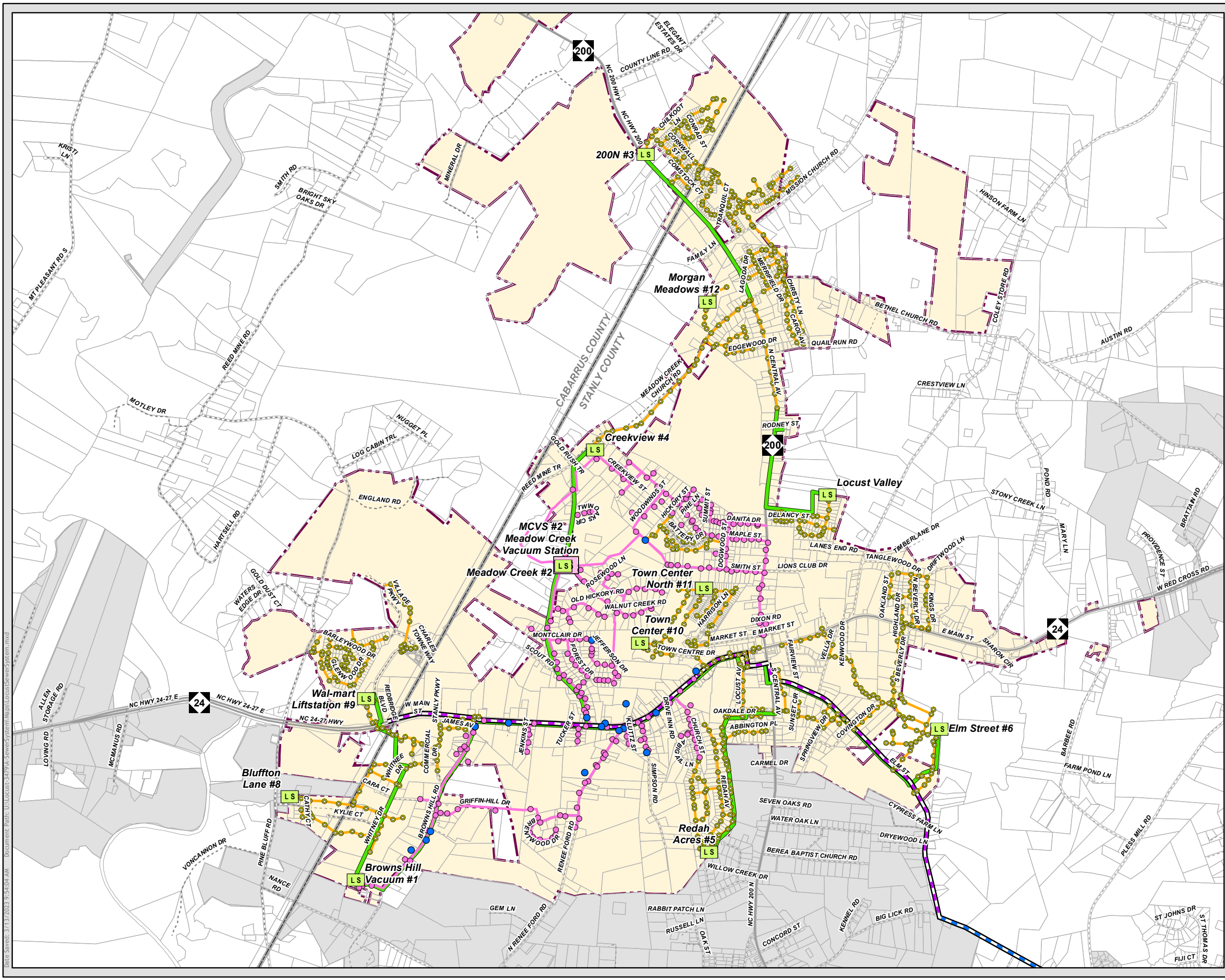
- Buffer Tank
- Vacuum Pit
- Manhole
- LS Lift Station
- VS Vacuum Station
- 8 in. Gravity Main
- Vacuum Sewer Main
- Force Main
- Force Main to Stanfield
- Force Main to Stanly County
- NC Route
- Street
- Parcel
- Town of Locust
- Other Municipality
- County Boundary



0 1,250 2,500  
Feet

# Wooten

The Wooten Company makes every effort to produce and publish GIS maps using the most current and accurate information possible, however the maps are strictly for planning purposes only. The maps are compiled from recorded deeds, plats, and other public and private records and data. Users of the maps are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information on this map. The Wooten Company assumes NO responsibility for the information contained on the maps unless the map is signed and sealed by a licensed Professional Land Surveyor. Please contact the GIS Group at (919) 828-0531 or [tcohan@thewootencompany.com](mailto:tcohan@thewootencompany.com) for data source information.



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## **APPENDIX 2**

### **2020 Sewer Billing Summary**

**SEWAGE PRODUCED BY TOWN CUSTOMERS**

*\*Based on 2020 Water Billings provided by the City of Locust. All else calculated.*

**Connections currently formed**

Type	# of Connections*	Metered Average Usage	
		(MGD)*	(gpd/connection)
Residential	1,274	0.158	124
Commercial	123	0.061	497
Institutional	11	0.003	306
Industrial	-	-	-
<b>Total</b>	<b>1,408</b>	<b>0.223</b>	<b>927</b>

**Potential connections to be formed (currently septic systems)\*\***

Type	# of Connections*	Metered Average Usage	
		(MGD)*	(gpd/connection)
Residential	260	0.045	119
Commercial	31	0.0008	61
Institutional	-	-	-
Industrial	-	-	-
<b>Total</b>	<b>291</b>	<b>0.046</b>	<b>180</b>

*\*\*If the septic systems of these customers failed, then they could connect to the Locust sewer system the next day.*

**2020 STANLY COUNTY SEWER BILLING DATA**

MONTH	Billed Days	LOCUST		
		(gals/mo.)	Avg. (gpd)	Peak Day (gpd)
JANUARY	31	8,633,520	278,501	545,180
FEBRUARY	29	8,536,464	294,361	774,699
MARCH	31	7,411,678	239,086	401,409
APRIL	30	6,928,169	230,939	571,562
MAY	31	10,145,811	327,284	867,588
JUNE	30	6,871,566	229,052	267,246
JULY	30	6,735,678	217,280	293,445
AUGUST	31	7,427,430	239,595	543,496
SEPTEMBER	30	7,526,989	250,900	431,712
OCTOBER	31	7,497,575	241,857	526,268
NOVEMBER	30	7,580,440	252,681	596,184
DECEMBER	31	7,730,087	249,358	427,096
<b>TOTAL</b>	<b>365</b>	<b>93,025,408</b>	<b>3,050,894</b>	<b>6,245,885</b>

**Peak (gpd): 867,588**  
**Avg. (gpd): 254,241**

**2021 STANLY COUNTY SEWER BILLING DATA**

MONTH	Billed Days	LOCUST		
		(gals/mo.)	Average (gpd)	Peak Day (gpd)
JANUARY	31	9,057,219	292,168	502,104
FEBRUARY	28	9,671,854	345,423	531,873
MARCH	31	8,736,386	281,819	417,313
APRIL	30	7,338,077	244,603	268,048
MAY	31	7,392,720	238,475	291,506
JUNE	30	7,380,871	246,029	349,935
JULY	30	7,515,877	242,448	295,830
AUGUST	31	8,123,890	262,061	354,422
SEPTEMBER	30	7,221,213	240,707	402,306
OCTOBER	31	7,961,217	256,813	595,320
NOVEMBER	30	7,162,703	238,757	294,569
DECEMBER	31	7,680,753	247,766	377,260
<b>TOTAL</b>	<b>364</b>	<b>95,242,779</b>	<b>3,137,069</b>	<b>4,680,486</b>

*Peak (gpd):*

**595,320**

*Avg. (gpd):*

**261,422**

**2022 STANLY COUNTY SEWER BILLING DATA**

MONTH	Billed Days	LOCUST		
		(gals/mo.)	Average (gpd)	Peak Day (gpd)
JANUARY	31	9,083,078	293,003	578,268
FEBRUARY	28	7,517,752	268,491	394,119
MARCH	31	8,873,384	286,238	518,369
APRIL	30	8,281,717	276,057	527,457
MAY	31	7,479,853	241,286	256,034
JUNE	30	7,204,890	240,163	256,940
JULY	30	8,458,134	272,843	412,864
AUGUST	31	7,896,255	254,718	338,081
SEPTEMBER	30	8,364,488	278,816	390,194
OCTOBER	31	8,259,262	266,428	334,592
NOVEMBER	30	9,059,801	301,993	502,087
DECEMBER	31	9,967,038	321,517	609,158
<b>TOTAL</b>	<b>364</b>	<b>100,445,651</b>	<b>3,301,553</b>	<b>5,118,164</b>

*Peak (gpd):*

**609,158**

*Avg. (gpd):*

**275,129**

**APPENDIX 3**

**2022 Fixed Asset Schedule**

**2023-2033 Sewer Capital Improvements Plans**

**Future Sewer CIP Maps**

**Stanly County WWTP Phase II Expansion Project Cost**

**Book Asset Detail 7/01/21 - 6/30/22**

FYE: 6/30/2022

Asset	d t	Property Description	Date In Service	Book Cost	Book Sec 179 Exp c	Book Sal Value	Book Prior Depreciation	Book Current Depreciation	Book End Depr	Book Net Book Value	Book Method	Book Period
1		Backhoe	11/01/96	39,644.00	0.00	0.00	39,644.00	0.00	39,644.00	0.00	S/L	5.00
2		Water & Sewer Lines	7/01/00	7,344,835.34	0.00	0.00	3,305,175.97	146,896.71	3,452,072.68	3,892,762.66	S/L	50.00
3		CPU, Monitor and Printer for Billin	5/03/01	1,509.59	0.00	0.00	1,509.59	0.00	1,509.59	0.00	S/L	5.00
4		Sewer Lines Phase III	6/30/06	3,200,895.26	0.00	0.00	960,268.65	64,017.91	1,024,286.56	2,176,608.70	S/L	50.00
5		Billing Software	11/15/01	7,205.30	0.00	0.00	7,205.30	0.00	7,205.30	0.00	S/L	5.00
6		Engineering Fees - Harry Dail	6/30/02	175,000.00	0.00	0.00	66,500.00	3,500.00	70,000.00	105,000.00	S/L	50.00
7		Sewer Line Phase IV	6/30/06	75,889.63	0.00	0.00	22,766.85	1,517.79	24,284.64	51,604.99	S/L	50.00
8		Sewer Line Extensions	9/29/03	10,046.40	0.00	0.00	3,566.51	200.93	3,767.44	6,278.96	S/L	50.00
9		Sewer Line Extensions	4/08/04	9,162.00	0.00	0.00	3,160.89	183.24	3,344.13	5,817.87	S/L	50.00
10		Sewer Lines Phase IV	6/30/06	161,835.26	0.00	0.00	48,550.65	3,236.71	51,787.36	110,047.90	S/L	50.00
11		Sewer Line Extensions	6/30/05	4,673.98	0.00	0.00	1,495.68	93.48	1,589.16	3,084.82	S/L	50.00
12		Sewer Lines Phase IV	6/30/06	130,691.05	0.00	0.00	39,207.30	2,613.82	41,821.12	88,869.93	S/L	50.00
13		Sewer Lines Phase III	6/30/06	37,041.73	0.00	0.00	11,112.45	740.83	11,853.28	25,188.45	S/L	50.00
14		Sewer Line Extensions	6/30/06	7,662.77	0.00	0.00	2,298.90	153.26	2,452.16	5,210.61	S/L	50.00
15		Sewer Line Extensions	6/30/07	8,391.42	0.00	0.00	2,349.62	167.83	2,517.45	5,873.97	S/L	50.00
16		Vacuum Pump RC0630	3/06/09	18,930.41	0.00	0.00	18,930.41	0.00	18,930.41	0.00	S/L	10.00
17		Cornell Pump	3/11/09	11,753.12	0.00	0.00	11,753.12	0.00	11,753.12	0.00	S/L	11.00
18		Chicago Tube & Iron Project	6/01/09	371,826.00	0.00	0.00	89,857.95	7,436.52	97,294.47	274,531.53	S/L	50.00
19		UPT Sewer Project	11/01/08	346,592.00	0.00	0.00	87,803.31	6,931.84	94,735.15	251,856.85	S/L	50.00
20		Rebuild of Sewer Pump	10/15/09	6,051.00	0.00	0.00	6,051.00	0.00	6,051.00	0.00	S/L	10.00
21		Bojangles Sewer Project	10/15/09	161,377.53	0.00	0.00	37,923.71	3,227.55	41,151.26	120,226.27	S/L	50.00
22		Villages of Redbridge	9/01/09	552,000.00	0.00	0.00	130,640.00	11,040.00	141,680.00	410,320.00	S/L	50.00
23		Portion of Tractor in WW Fund	8/19/11	5,192.25	0.00	0.00	5,192.25	0.00	5,192.25	0.00	S/L	5.00
24		Construction - King Heights Sewer	7/01/14	43,650.35	0.00	0.00	6,111.07	873.01	6,984.08	36,666.27	S/L	50.00
25		Construction - Clearwater, Inc.	7/01/14	2,111.00	0.00	0.00	295.54	42.22	337.76	1,773.24	S/L	50.00
26		Construction - Covalen	6/14/13	1,900.00	0.00	0.00	266.00	38.00	304.00	1,596.00	S/L	50.00
27		Sherwood Pk/Kings Heights Sewer	6/30/14	922,471.50	0.00	0.00	129,146.01	18,449.43	147,595.44	774,876.06	S/L	50.00
28		1/3 Cost Trailer RS Braswell	9/30/16	4,511.66	0.00	0.00	4,286.07	225.59	4,511.66	0.00	S/L	5.00
29		1/4 Cost Bobcat Braswell	10/20/16	6,416.02	0.00	0.00	5,988.27	427.75	6,416.02	0.00	S/L	5.00
30		1/3 Cost Mini Excavator Braswell	1/13/17	7,890.19	0.00	0.00	7,101.18	789.01	7,890.19	0.00	S/L	5.00
31		Buffer Tank	3/15/17	9,257.92	0.00	0.00	4,011.76	925.79	4,937.55	4,320.37	S/L	10.00
32		Sanitary Sewer Analysis North Sew	2/10/17	15,624.00	0.00	0.00	0.00	0.00	0.00	15,624.00	Memo	0.00
33		Manhole Rehab CMS	6/23/17	17,299.00	0.00	0.00	2,652.51	691.96	3,344.47	13,954.53	S/L	25.00
34		Engineering Fees	5/24/18	39,895.28	0.00	0.00	0.00	0.00	0.00	39,895.28	Memo	0.00
35		Manhole Repairs	9/15/17	17,299.00	0.00	0.00	2,652.51	691.96	3,344.47	13,954.53	S/L	25.00
36		Labor/Parts Sewer Pump Overhaul	5/16/18	6,037.78	0.00	0.00	744.66	241.51	986.17	5,051.61	S/L	25.00
37		Sanitary Sewer Analysis North Sew	5/24/18	1,266.50	0.00	0.00	0.00	0.00	0.00	1,266.50	Memo	0.00
38		Sanitary Sewer Analysis North Sew	6/29/18	1,384.80	0.00	0.00	0.00	0.00	0.00	1,384.80	Memo	0.00
39		Jet Vac Trailer Mount Sewer Clean	7/07/18	52,393.79	0.00	0.00	15,718.14	5,239.38	20,957.52	31,436.27	S/L	10.00
40		MI Brushcat 72	2/21/19	5,658.20	0.00	0.00	1,320.25	565.82	1,886.07	3,772.13	S/L	10.00
41		7 Gallon Pump, 6 Single Shore	2/13/19	5,145.00	0.00	0.00	1,243.38	514.50	1,757.88	3,387.12	S/L	10.00
42		Camera, Reel, Monitor	6/24/19	11,491.12	0.00	0.00	2,298.22	1,149.11	3,447.33	8,043.79	S/L	10.00
43		Chambers Engineering REDAH Pur	4/01/21	16,240.55	0.00	0.00	81.20	324.81	406.01	15,834.54	S/L	50.00
44		Chambers Engineering	4/01/21	59,138.20	0.00	0.00	295.69	1,182.76	1,478.45	57,659.75	S/L	50.00
45		WW Computer Software New Platf	5/28/20	10,239.73	0.00	0.00	3,697.68	3,413.24	7,110.92	3,128.81	S/L	3.00
46		Ford F250 2019	10/31/19	39,741.00	0.00	0.00	11,039.17	6,623.50	17,662.67	22,078.33	S/L	6.00
47		Boom Addition for F250 placed in s	12/13/19	23,527.00	0.00	0.00	6,208.52	3,921.17	10,129.69	13,397.31	S/L	6.00
48		Sewer Pumps Alarm System	2/20/20	11,890.00	0.00	0.00	1,585.33	1,189.00	2,774.33	9,115.67	S/L	10.00
49		Herrin Industrial Redah PS	4/01/21	323,189.22	0.00	0.00	1,615.95	6,463.78	8,079.73	315,109.49	S/L	50.00
50		N Basin Sanitary Chambers	6/30/20	109,740.86	0.00	0.00	0.00	0.00	0.00	109,740.86	Memo	0.00
51		Sewer Alarm System	8/27/20	9,764.80	0.00	0.00	813.73	976.48	1,790.21	7,974.59	S/L	10.00

**Book Asset Detail 7/01/21 - 6/30/22**

FYE: 6/30/2022

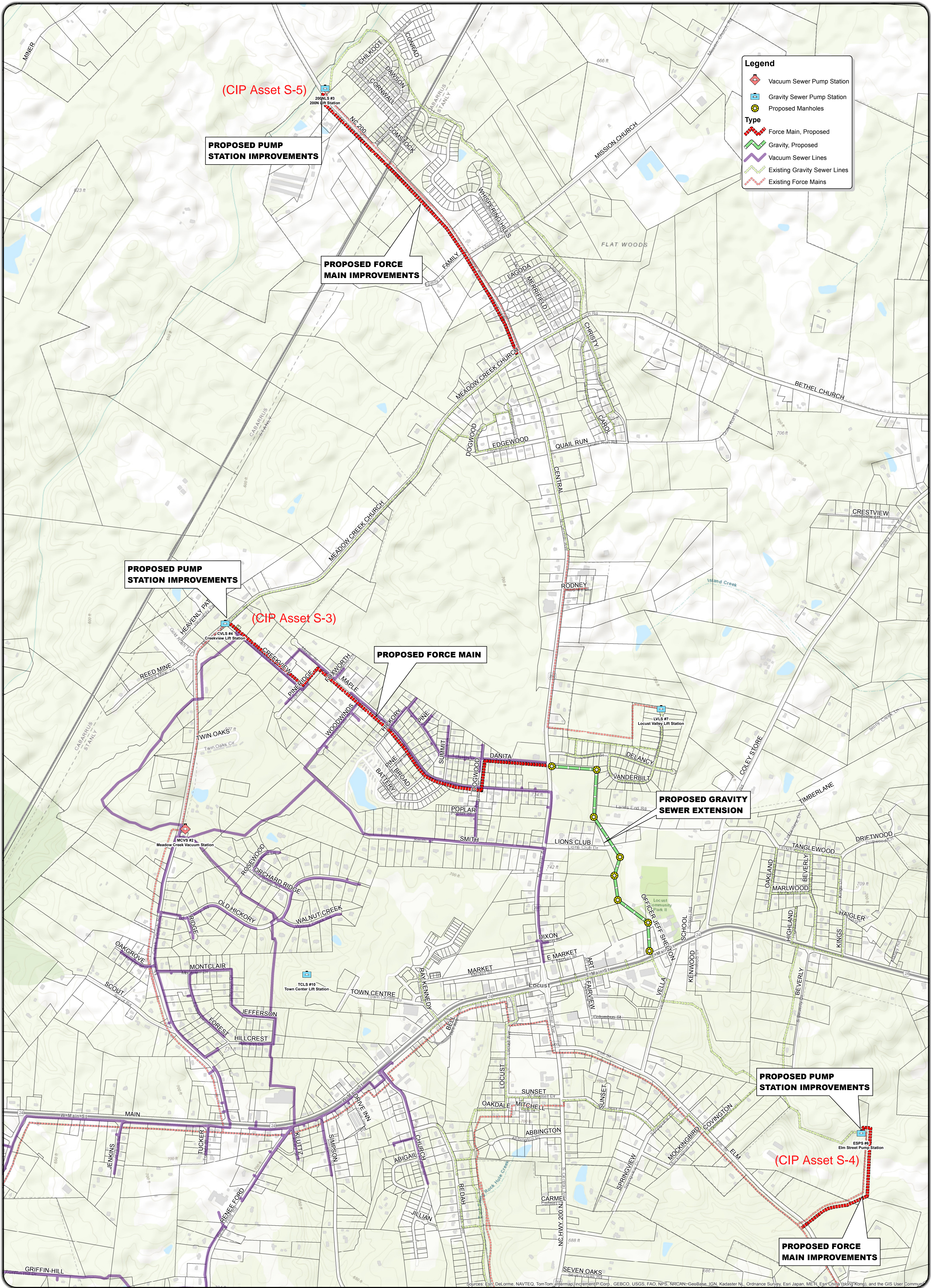
Asset	d t	Property Description	Date In Service	Book Cost	Book Sec 179 Exp c	Book Sal Value	Book Prior Depreciation	Book Current Depreciation	Book End Depr	Book Net Book Value	Book Method	Book Period
52		Software Implementation	9/11/20	3,071.25	0.00	0.00	853.13	1,023.75	1,876.88	1,194.37	S/L	3.00
53		Bondo Fabricated Aluminum Roofs	6/03/21	3,850.00	0.00	0.00	21.39	256.67	278.06	3,571.94	S/L	15.00
54		Redah PS Improvements	4/01/21	631,693.25	0.00	0.00	3,158.47	12,633.87	15,792.34	615,900.91	S/L	50.00
55		N Basin PS Improvements Cap Prof	6/30/21	46,130.35	0.00	0.00	0.00	0.00	0.00	46,130.35	Memo	0.00
56		Flovac - Vacuum Pit	7/22/21	12,450.00	0.00c	0.00	0.00	1,141.25	1,141.25	11,308.75	S/L	10.00
57		Clear Water - Alarm System	9/16/21	12,248.80	0.00c	0.00	0.00	918.66	918.66	11,330.14	S/L	10.00
58		Flovac - Remote Monitoring Equipr	11/04/21	14,244.40	0.00c	0.00	0.00	949.63	949.63	13,294.77	S/L	10.00
59		Remote Monitoring System Implem	11/04/21	16,600.00	0.00c	0.00	0.00	1,106.67	1,106.67	15,493.33	S/L	10.00
60		Busch Vacuum Pump	2/17/22	24,899.00	0.00c	0.00	0.00	829.97	829.97	24,069.03	S/L	10.00
61		Busch Vacuum Pump	4/14/22	24,899.00	0.00c	0.00	0.00	622.48	622.48	24,276.52	S/L	10.00
62		Busch Vacuum Pump	4/14/22	26,144.00	0.00c	0.00	0.00	653.60	653.60	25,490.40	S/L	10.00
63		Pump Repair	4/14/22	7,218.00	0.00c	0.00	0.00	180.45	180.45	7,037.55	S/L	10.00
64		Busch Vacuum Pump	5/25/22	26,144.00	0.00c	0.00	0.00	217.87	217.87	25,926.13	S/L	10.00
65		Capital Project - N Basin Improvem	5/12/22	3,285.00	0.00c	0.00	0.00	36.50	36.50	3,248.50	S/L	15.00
66		Capital Project - N Basin Improvem	6/10/22	3,099.28	0.00c	0.00	0.00	17.22	17.22	3,082.06	S/L	15.00
<b>Grand Total</b>				<u>15,319,356.84</u>	<u>0.00c</u>	<u>0.00</u>	<u>5,116,169.94</u>	<u>327,506.79</u>	<u>5,443,676.73</u>	<u>9,875,680.11</u>		



**City of Locust Wastewater Enterprise Fund  
10 YEAR SCHEDULE FOR CAPITAL IMPROVEMENTS PLAN**

CATEGORY / IMPROVEMENT	COST	YEAR 1 2023-2024	YEAR 2 2024-2025	YEAR 3 2025-2026	YEAR 4 2026-2027	YEAR 5 2027-2028	YEAR 6 2028-2029	YEAR 7 2029-2030	YEAR 8 2030-2031	YEAR 9 2031-2032	YEAR 10 2032-2033
<b>Wastewater Collection System Construction</b>											
Meadow Creek Lift Station Conversion	\$ 500,000	\$ -	\$ -	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
Meadow Creek Lift Station Improvements	\$ 250,000				\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000
Browns Hill Vacuum Station Improvements	\$ 70,000				\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
200N Lift Station Improvements	\$ 1,635,975	\$ 163,598	\$ 163,598	\$ 163,598	\$ 163,598	\$ 163,598	\$ 163,598	\$ 163,598	\$ 163,598	\$ 163,598	\$ 163,598
Elm Street Lift Station Improvements	\$ 1,318,235	\$ 131,824	\$ 131,824	\$ 131,824	\$ 131,824	\$ 131,824	\$ 131,824	\$ 131,824	\$ 131,824	\$ 131,824	\$ 131,824
Walmart Lift Station Improvements	\$ 100,000				\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Creekview Lift Station Improvements	\$ 2,257,850	\$ 225,785	\$ 225,785	\$ 225,785	\$ 225,785	\$ 225,785	\$ 225,785	\$ 225,785	\$ 225,785	\$ 225,785	\$ 225,785
<b>SUBTOTAL</b>	<b>\$ 6,132,060</b>										
<b>Wastewater System Repairs/Maintenance</b>											
Overhaul Vacuum Pumps	\$ 50,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
Overhaul Sewer Pumps	\$ 50,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
Misc. Sewer Line Repairs	\$ 200,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
Isolation Valves	\$ 100,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
<b>SUBTOTAL</b>	<b>\$ 400,000</b>										
<b>Wastewater System Equipment</b>											
SCADA System Telemetry	\$ 200,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
New Service Truck	\$ 135,000			\$ 45,000			\$ 45,000			\$ 45,000	
Misc. Equipment	\$ 300,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000
<b>SUBTOTAL</b>	<b>\$ 635,000</b>										
<b>WSTP 2.5MGD Expansion Share</b>											
Expansion Share	\$ 2,100,000				\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000
<b>SUBTOTAL</b>	<b>\$ 2,100,000</b>										
<b>TOTAL ANNUAL CAPITAL IMPROVEMENTS</b>	<b>\$ 9,267,060</b>	<b>\$ 611,206</b>	<b>\$ 611,206</b>	<b>\$ 656,206</b>	<b>\$ 1,006,206</b>	<b>\$ 1,006,206</b>	<b>\$ 1,051,206</b>	<b>\$ 1,006,206</b>	<b>\$ 1,006,206</b>	<b>\$ 1,051,206</b>	<b>\$ 1,006,206</b>

SDF-eligible projects

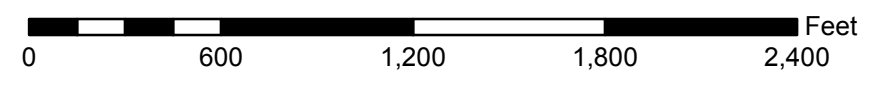
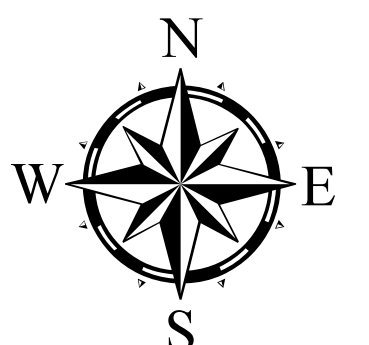


Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Beijing), and the GIS User Community



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City of Locust  
Wastewater Master Plan  
North/ East Sewer Basins



**Owner:** City of Locust  
**Project Name:** 2022 Sewer Improvements  
**Description:** Infrastructure Development Budget

**East, Creekview, North  
Basin Sanitary Sewer**

	<b>Section Cost</b>
East Basin Improvements \$	1,318,232.18
Creekview Basin Improvements \$	2,257,848.48
North Basin Improvements \$	1,635,974.75
<b>Total Construction Cost \$</b>	<b><u>5,212,055.00</u></b>

**Owner:** City of Locust  
**Project Name:** 2022 Sewer Improvements  
**Description:** East Basin

No.	Item Description	Unit	Est. Qty.	Unit Price	Total Line Price
1.0	Mobilization	Lump Sum	1	\$ 24,000.00	\$ 24,000.00
1.1	Clearing & Grubbing	Acre	1.1	\$ 8,500.00	\$ 9,132.23
1.2	12" AWWA C900 DR18 PVC FM	Plan Linear Feet	2100	\$ 108.00	\$ 226,800.00
1.3	12" Ductile Iron Pipe PC 350 FM	Plan Linear Feet	200	\$ 120.00	\$ 24,000.00
1.4	12" Ductile Iron Pipe PC 350 FM, Rest. Joint	Plan Linear Feet	40	\$ 135.00	\$ 5,400.00
1.5	12" Cut In Tee & Valve	Each	1	\$ 15,000.00	\$ 15,000.00
1.6	Air Release Valve & Manhole	Each	2	\$ 16,500.00	\$ 33,000.00
1.7	Seeding & Mulching	Acre	2.1	\$ 3,500.00	\$ 7,520.66
1.8	Erosion Control - Sediment Fence	Plan Linear Feet	2340	\$ 6.00	\$ 14,040.00
1.9	Cleanup & Certification	Lump Sum	1	\$ 25,000.00	\$ 25,000.00
2.0	Rock Excavation	Cubic Yard	156	\$ 125.00	\$ 19,500.00
2.1	Duplex Pump Station	Lump Sum	1	\$ 795,000.00	\$ 795,000.00
<b>Sub-Total Construction</b>					<b>\$ 1,198,392.89</b>
<b>Construction Contingency 10%</b>					<b>\$ 119,839.29</b>
<b>Total Project Cost</b>					<b>\$ 1,318,232.18</b>

**Owner:** City of Locust  
**Project Name:** 2022 Sewer Improvements  
**Description:** Creekview Basin

No.	Item Description	Unit	Est. Qty.	Unit Price	Total Line Price
1.0	Mobilization	Lump Sum	1	\$ 24,000.00	\$ 24,000.00
1.1	Clearing & Grubbing	Acre	4.7	\$ 8,500.00	\$ 39,807.16
1.2	10" AWWA C900 DR18 PVC FM	Plan Linear Feet	9200	\$ 80.00	\$ 736,000.00
1.3	10" Ductile Iron Pipe PC 350 FM	Plan Linear Feet	500	\$ 130.00	\$ 65,000.00
1.4	10" Ductile Iron Pipe PC 350 FM, Rest. Joint	Plan Linear Feet	500	\$ 155.00	\$ 77,500.00
1.5	16" SCP Bore & Jack, Not In Soil	Plan Linear Feet	60	\$ 1,825.00	\$ 109,500.00
1.6	16" SCP Bore & Jack, In Soil	Plan Linear Feet	60	\$ 680.00	\$ 40,800.00
1.7	Connect to Exist. Manhole	Each	1	\$ 7,500.00	\$ 7,500.00
1.8	Air Release Valve & Manhole	Each	3	\$ 16,500.00	\$ 49,500.00
1.9	Replace Gravel Driveways, 6"	Square Feet	3000	\$ 5.00	\$ 15,000.00
2.0	Asphalt Replacement	Ton	50	\$ 180.00	\$ 9,000.00
2.1	Seeding & Mulching	Acre	9.4	\$ 3,500.00	\$ 32,782.37
2.2	Erosion Control - Sediment Fence	Plan Linear Feet	10200	\$ 6.00	\$ 61,200.00
2.3	Cleanup & Certification	Lump Sum	1	\$ 25,000.00	\$ 25,000.00
2.4	Rock Excavation	Cubic Yard	680	\$ 125.00	\$ 85,000.00
2.5	Duplex Pump Station	Lump Sum	1	\$ 675,000.00	\$ 675,000.00
<b>Sub-Total Construction</b>					<b>\$ 2,052,589.53</b>
<b>Construction Contingency 10%</b>					<b>\$ 205,258.95</b>
<b>Total Project Cost</b>					<b>\$ 2,257,848.48</b>

**Owner:** City of Locust  
**Project Name:** 2022 Sewer Improvements  
**Description:** North Basin

No.	Item Description	Unit	Est. Qty.	Unit Price	Total Line Price
1.0	Mobilization	Lump Sum	1	\$ 24,000.00	\$ 24,000.00
1.1	Clearing & Grubbing	Acre	2.3	\$ 8,500.00	\$ 19,513.31
1.2	8" AWWA C900 DR18 PVC FM	Plan Linear Feet	4500	\$ 76.00	\$ 342,000.00
1.3	8" Ductile Iron Pipe PC 350 FM	Plan Linear Feet	300	\$ 124.00	\$ 37,200.00
1.4	8" Ductile Iron Pipe PC 350 FM, Rest. Joint	Plan Linear Feet	200	\$ 130.00	\$ 26,000.00
1.5	16" SCP Bore & Jack, Not In Soil	Plan Linear Feet	60	\$ 1,825.00	\$ 109,500.00
1.6	16" SCP Bore & Jack, In Soil	Plan Linear Feet	60	\$ 680.00	\$ 40,800.00
1.7	Connect to Exist. Manhole	Each	1	\$ 7,500.00	\$ 7,500.00
1.8	Air Release Valve & Manhole	Each	4	\$ 16,500.00	\$ 66,000.00
1.9	Replace Gravel Driveways, 6"	Square Feet	3000	\$ 5.00	\$ 15,000.00
2.0	Asphalt Replacement	Ton	50	\$ 180.00	\$ 9,000.00
2.1	Seeding & Mulching	Acre	4.6	\$ 3,500.00	\$ 16,069.79
2.2	Erosion Control - Sediment Fence	Plan Linear Feet	5500	\$ 6.00	\$ 33,000.00
2.3	Cleanup & Certification	Lump Sum	1	\$ 25,000.00	\$ 25,000.00
2.4	Rock Excavation	Cubic Yard	333	\$ 125.00	\$ 41,666.67
2.5	Duplex Pump Station	Lump Sum	1	\$ 675,000.00	\$ 675,000.00
<b>Sub-Total Construction</b>					<b>\$ 1,487,249.77</b>
<b>Construction Contingency 10%</b>					<b>\$ 148,724.98</b>
<b>Total Project Cost</b>					<b>\$ 1,635,974.75</b>

**Table 4.2**  
**Alternative 1: Conventional Extended Aeration**  
**West Stanly WWTP Upgrade to 2.5 MGD**

**Opinion of Probable Project Cost**

Item Description	Estimated Cost
<b>Modifications to Existing WWTP</b>	
Reuse Existing Pkg Screen and Grit Unit	\$80,000
Repurpose Existing Aeration Basins for Sludge Digestion/Holding	\$428,000
Repurpose Existing 50-ft Final Clarifier to Sludge Thickening/Holding	\$97,000
Expand Existing Chlorine Disinfection Unit	\$232,000
Upgrade Existing Aerobic Digester Equipment	\$123,000
Expand Effluent Pump Station	\$465,000
Upgrade Existing Effluent Pump Station Control Panels	\$39,000
Upgrade Lab/Control Building	\$66,000
<b>New 2.5 MGD WWTP on Adjacent Land</b>	
EQ Basin Pump Station	\$301,000
Plant Drain Pump Station	\$137,000
EQ Basin	\$2,543,000
New Influent Splitter Box	\$27,000
New Aeration Tanks	\$2,433,000
New Effluent Splitter Box after Aeration Tanks	\$27,000
Final Clarifier	\$871,000
RAS/WAS	\$498,000
Miscellaneous Instrumentation	\$47,000
Chemical Feed Systems	\$329,000
New Disc Filters	\$976,000
Blower & Chemical Building, 70' x 30', 2,100 sq. ft. @ \$250/sq. ft.	\$574,000
New Equipment Storage Pole Building, 40' x 24', 960 sq ft @ \$125/sq ft	\$132,000
Fencing	\$42,000
SCADA system	\$383,000
2nd Emergency Generator for new part of WWTP	\$274,000
Power Supply Increase	\$33,000
<i>Subtotal Cost</i>	<i>\$11,157,000</i>
Site Work (5% of subtotal)	\$558,000
Yard Piping (15% of subtotal)	\$1,674,000
Misc. Metals (3% of subtotal cost)	\$335,000
HVAC (8% of bld cost)	\$56,000
Plumbing (7% of bld cost)	\$49,000
WWTP Electrical	\$3,348,000
Relocate WWTP Potable Water Well	\$39,000
New 16-inch McCoy Force Main to WWTP, 17,000 LF	\$1,803,000
New 24-inch Effluent Outfall Pipe, 13,000 LF	\$2,170,000
McCoy Pump Station Upgrade	\$864,000
WWTP Mob./Demob., Bonding/Ins. PM + Contractor O&P (11%)	\$1,894,000
<b>Subtotal</b>	<b>\$23,950,000</b>
Capital Contingencies (10%)	\$2,395,000
<i>Subtotal + Contingencies</i>	<i>\$26,345,000</i>
Basic Engineering Services <sup>1</sup>	\$1,533,000
Resident Project Representative <sup>2</sup> (Construction Observation)	\$360,000
Additional Services	\$153,000
Lands and Rights, Acquire ~ 40 acres	\$520,000
Equipment	\$192,000
Legal/Admin. Services	\$55,000
Capitalized Interest (interim financing with USDA)	\$1,537,000
<b>Total Estimated Capital Cost</b>	<b>\$30,700,000</b>

<sup>1</sup> PER/EID, Engineering Design/Bidding, Environmental Permitting, and Construction Administration

<sup>2</sup> Based on 18 mo. construction schedule and full-time observation (18 mo. full-time)

## **APPENDIX 4**

### **System Development Fee Worksheets**



System Development Fees

Summary Worksheet

Client: City of Locust, NC

Accounting Methodology:

Buy-In Cost Pay proportional share of past and current investments (for existing utilities/facilities to support existing/new growth)
Incremental Cost Pay increase in total costs resulting from increase in production (for new utilities/facilities to support new growth only)
Combined Cost Combination of Buy-In and Incremental Costs

enter as positive values and subtract from total costs

BUY-IN METHOD

Project Costs

Project Credits

Table with columns: Asset ID/Ref., Asset Description, Asset Group, Construction Cost, Survey & Engineering Fees, Land Acquisition Cost, Debt Principal and Interest Pmts, Total Costs, Accumulated Depreciation, Debt Credits, Principal Forgiveness / Grants, Total Credits, Net Total Cost, Net Replacement Cost (RCNLD), SDF Eligible?, Eligible Net Total Cost, Comments. Rows include various sewer lines, pump repairs, and system improvements.

Summary table for SEWER with columns: Residential, Commercial, Institutional, Industrial, Total, Ex. Population, Population Customer Ratio, Design Capacity, Sewer SDF (Buy-in).

Table for CURRENT YEAR - 2020 with columns: Residential, Commercial, Institutional, Industrial, Total, Ex. Population, Population Customer Ratio.

Table for Meter Size - per GALLON Basis with columns: Meter Size, Equivalent Ratio, Sewer.

Table for Meter Size - per CONNECTION basis with columns: Meter Size, Equivalent Ratio, Sewer.

System Development Fees  
 Depreciation Worksheet  
 Client:

City of Locust, NC

BUY-IN METHOD Evaluation Year 2022

Project No.	Project Description	Year Installation	Approximate Age	Actual Cost	CCI Number	Accumulated Depreciation to		Net Replacement Cost
						Date	Net Total Cost	
SEWER								
2	Water and Sewer Lines	2000	22	\$ 7,344,835	42.9	\$ 3,452,073	\$ 3,892,763	\$ 9,074,039
4	Sewer Lines Phase III (8")	2006	16	\$ 3,200,895	56.4	\$ 1,024,287	\$ 2,176,609	\$ 3,859,235
6	Engineering Fees - Harry Dail	2002	20	\$ 175,000	45.8	\$ 70,000	\$ 105,000	\$ 229,258
7	Sewer Line Phase IV (8")	2006	16	\$ 75,890	56.4	\$ 24,285	\$ 51,605	\$ 91,498
8	Sewer Line Extensions (8")	2003	19	\$ 10,046	46.8	\$ 3,767	\$ 6,279	\$ 13,417
9	Sewer Line Extensions (8")	2004	18	\$ 9,162	48.0	\$ 3,344	\$ 5,818	\$ 12,121
10	Sewer Line Phase IV (8")	2006	16	\$ 161,835	56.4	\$ 51,787	\$ 110,048	\$ 195,120
11	Sewer Line Extensions (8")	2005	17	\$ 4,674	53.0	\$ 1,589	\$ 3,085	\$ 5,820
12	Sewer Lines Phase IV (8")	2006	16	\$ 130,691	56.4	\$ 41,821	\$ 88,870	\$ 157,571
13	Sewer Lines Phase III (8")	2006	16	\$ 37,042	56.4	\$ 11,853	\$ 25,188	\$ 44,660
14	Sewer Line Extensions (8")	2006	16	\$ 7,663	56.4	\$ 2,452	\$ 5,211	\$ 9,239
15	Sewer Line Extensions (8")	2007	15	\$ 8,391	59.6	\$ 2,517	\$ 5,874	\$ 9,856
18	Chicago Tube and Iron Project	2009	13	\$ 371,826	65.9	\$ 97,294	\$ 274,532	\$ 416,588
19	UPT Sewer Project	2008	14	\$ 346,592	61.8	\$ 94,735	\$ 251,857	\$ 407,535
21	Bojangles Sewer Project	2009	13	\$ 161,378	65.9	\$ 41,151	\$ 120,226	\$ 182,437
22	Villages of Redbridge	2009	13	\$ 552,000	65.9	\$ 141,680	\$ 410,320	\$ 622,640
24	Construction - King Heights Sewer	2014	8	\$ 43,650	73.3	\$ 6,984	\$ 36,666	\$ 50,022
25	Construction - Clearwater, Inc.	2014	8	\$ 2,111	73.3	\$ 338	\$ 1,773	\$ 2,419
26	Construction - Covalen	2013	9	\$ 1,900	71.1	\$ 304	\$ 1,596	\$ 2,245
27	Sherwood Pk/Kings Heights Sewer	2014	8	\$ 922,472	73.3	\$ 147,595	\$ 774,876	\$ 1,057,130
31	Buffer Tank	2017	5	\$ 9,258	75.6	\$ 4,938	\$ 4,320	\$ 5,715
32	Sanitary Sewer Analysis North Sewer	2017	5	\$ 15,624	75.6	\$ -	\$ 15,624	\$ 20,667
33	Manhole Rehab CMS	2017	5	\$ 17,299	75.6	\$ 3,344	\$ 13,955	\$ 18,458
34	Engineering Fees	2018	4	\$ 39,895	78.6	\$ -	\$ 39,895	\$ 50,757
35	Manhole Repairs	2017	5	\$ 17,299	75.6	\$ 3,344	\$ 13,955	\$ 18,458
36	Labor/Parts Sewer Pump Overhaul	2018	4	\$ 6,038	78.6	\$ 986	\$ 5,052	\$ 6,427
37	Sanitary Sewer Analysis North Sewer	2018	4	\$ 1,267	78.6	\$ -	\$ 1,267	\$ 1,611
38	Sanitary Sewer Analysis North Sewer	2018	4	\$ 1,385	78.6	\$ -	\$ 1,385	\$ 1,762
41	7 Gallon Pump, 6 Single Shore	2019	3	\$ 5,145	82.1	\$ 1,758	\$ 3,387	\$ 4,126
43	Chambers Engineering REDAH	2021	1	\$ 16,241	86.1	\$ 406	\$ 15,835	\$ 18,391
44	Chanmbers Engineering	2021	1	\$ 59,138	86.1	\$ 1,478	\$ 57,660	\$ 66,968
48	Sewer Pumps Alarm System	2020	2	\$ 11,890	84.6	\$ 2,774	\$ 9,116	\$ 10,775
49	Herrin Industrial Redah PS	2021	1	\$ 323,189	86.1	\$ 8,080	\$ 315,109	\$ 365,981
50	N Bsin Sanitary Chambers	2020	2	\$ 109,741	84.6	\$ -	\$ 109,741	\$ 129,717
51	Sewer Alarm System	2020	2	\$ 9,765	84.6	\$ 1,790	\$ 7,975	\$ 9,426
54	Redah PS Improvements	2021	1	\$ 631,693	86.1	\$ 15,792	\$ 615,901	\$ 715,332
55	N Basin PS Improvements Cap Prof	2021	1	\$ 46,130	86.1	\$ -	\$ 46,130	\$ 53,578
56	Flovac- Vacuum Pit	2021	1	\$ 12,450	86.1	\$ 1,141	\$ 11,309	\$ 13,134
57	Clear Water - Alarm System	2021	1	\$ 12,248	86.1	\$ 919	\$ 11,329	\$ 13,158
58	Flovac- Remote Monitoring Equipment	2021	1	\$ 14,244	86.1	\$ 950	\$ 13,294	\$ 15,441
59	Remote Monitoring System Implementation	2021	1	\$ 16,600	86.1	\$ 1,107	\$ 15,493	\$ 17,995
60	Busch Vacuum Pump	2022	0	\$ 24,899	100.0	\$ 830	\$ 24,069	\$ 24,069
61	Busch Vacuum Pump	2022	0	\$ 24,899	100.0	\$ 622	\$ 24,277	\$ 24,277
62	Busch Vacuum Pump	2022	0	\$ 26,144	100.0	\$ 654	\$ 25,490	\$ 25,490
63	Pump Repair	2022	0	\$ 7,218	100.0	\$ 180	\$ 7,038	\$ 7,038
64	Busch Vacuum Pump	2022	0	\$ 26,144	100.0	\$ 218	\$ 25,926	\$ 25,926
65	Capital Project - N Basin Improvements	2022	0	\$ 3,285	100.0	\$ 37	\$ 3,249	\$ 3,249
66	Capital Project - N Basin Improvements	2022	0	\$ 3,099	100.0	\$ 38	\$ 3,062	\$ 3,062
CIP: S-2	Browns Hill Vacuum Station Improvements	2026	-4	\$ 70,000	100.0	\$ -	\$ 70,000	\$ 70,000
CIP: S-6	Meadow Creek Lift Station Conversion	2026	-4	\$ 500,000	100.0	\$ -	\$ 500,000	\$ 500,000
CIP: S-7	Meadow Creek Lift Station Improvements	2026	-4	\$ 250,000	100.0	\$ -	\$ 250,000	\$ 250,000
CIP: S-8	Walmart Lift Station Improvements	2026	-4	\$ 100,000	100.0	\$ -	\$ 100,000	\$ 100,000
<b>TOTAL</b>				\$ 15,980,280		\$ 5,271,244	\$ 10,709,036	\$ 19,033,838

**System Development Fees**

**CCI Worksheet**

**Client:** City of Locust, NC

<b>Year</b>	<b>Historical CCI</b>	<b>Current CCI</b>
1970	27.8	10.0
1975	43.7	15.8
1980	60.7	21.9
1985	81.8	29.5
1990	93.2	33.7
2000	118.9	42.9
2001	122.2	44.1
2002	126.7	45.8
2003	129.7	46.8
2004	132.8	48.0
2005	146.7	53.0
2006	156.2	56.4
2007	165.0	59.6
2008	171.0	61.8
2009	182.5	65.9
2010	181.6	65.6
2011	185.7	67.1
2012	194.0	70.1
2013	196.9	71.1
2014	203.0	73.3
2015	204.0	73.7
2016	207.7	75.0
2017	209.4	75.6
2018	217.7	78.6
2019	227.3	82.1
2020	234.3	84.6
2021	238.3	86.1
2022	276.9	100.0

**System Development Fees  
Summary Worksheet**

Client: City of Locust, NC

Accounting Methodology:

Buy-In Cost      Pay proportional share of past and current investments (for existing utilities/facilities to support existing/new growth)  
 Incremental Cost      Pay increase in total costs resulting from increase in production (for new utilities/facilities to support new growth only)  
 Combined Cost      Combination of Buy-In and Incremental Costs

enter as positive values and subtract from total costs

INCREMENTAL COST METHOD		Anticipated Project Costs							Anticipated Project Credits			Net Total Cost per						
Asset/Project ID	CIP Asset/Project Description	Asset Group	Construction Cost	Survey & Engineering Fees	Land Acquisition Cost	Debt Principal and Interest Pmts	SDF Professional Fees	Total Costs	Principal Forgiveness / Grants	Debt Credits	Total Credits	Net Total Cost	Design Capacity, MGD	Gal Capacity, \$/GPD	% Min. Credit <sup>1</sup>	% SDF Eligible	\$ Sewer System Affiliation	Comments
SEWER																		
CIP: S-1	West Stanly WWTP Phase II Expansion and Force Main Improvements	Sewer - Treatment	\$ 26,957,000	\$ 1,686,000	\$ 520,000	\$ 1,537,000		\$ 30,700,000	\$ 6,500,000		\$ 6,500,000	\$ 24,200,000	2.500	\$ 9.68	25%	66%	\$ 4.79	Remaining capacity of 0.352 MGD + 1.3 MGD additional capacity (unallocated) from expansion.
CIP: S-3	Creekview Lift Station Improvements (i.e., Creekview Basin Improvements)	Sewer - Collection	\$ 2,257,850					\$ 2,257,850	\$ 563,156		\$ 563,156	\$ 1,694,694	0.720	\$ 2.35	25%	40%	\$ 0.71	To be conservative, the difference between existing and future capacity used to determine % SDF Eligibility.
CIP: S-4	Elm Street Lift Station Improvements (i.e., East Basin Improvements)	Sewer - Collection	\$ 1,318,235					\$ 1,318,235	\$ 328,796		\$ 328,796	\$ 989,439	1.744	\$ 0.57	25%	30%	\$ 0.13	To be conservative, the difference between existing and future capacity used to determine % SDF Eligibility.
CIP: S-5	Hwy 200N Lift Station Improvements (i.e., North Basin Improvements)	Sewer - Collection	\$ 1,635,975					\$ 1,635,975	\$ 408,047		\$ 408,047	\$ 1,227,928	0.549	\$ 2.24	25%	40%	\$ 0.67	To be conservative, the difference between existing and future capacity used to determine % SDF Eligibility.
<b>TOTAL</b>			\$ 32,169,060	\$ 1,686,000	\$ 520,000	\$ 1,537,000	\$ -	\$ 35,912,060	\$ 7,799,999	\$ -	\$ 7,799,999	\$ 28,112,061		\$ 14.84		\$ 17,437,881	\$ 6.30	

<sup>1</sup> Minimum 25% credit for extension or new infrastructure projects, per N.C. General Statute section 162A-207(b).

SEWER							
CURRENT YEAR - 2020	Residential	Commercial	Institutional	Industrial	Total	Ex. Population	Population: Customer Ratio
No. of Existing Connections	1,274	123	11	-	1,408	5,845	4.15
Percent of Total Connections	90.5%	8.7%	0.8%	0.0%			
Volumetric Use per Connection, gpd	360	500	310	-			
Total Existing Volumetric Use, gpd	458,640	61,500	3,410	-	523,550		
Percent of Total Use	88%	12%	1%	0%			

Meter Size - per GALLON Basis	Equivalent Ratio	Sewer
5/8	1.0	\$6.30
1	2.5	\$15.75
1-1/2	5.0	\$31.50
2	8.0	\$50.40
3 compound	16.0	\$100.80
4 compound	25.0	\$157.50
6 compound	50.0	\$315.00
8 compound	80.0	\$504.00
10 compound	115.0	\$724.50
12 compound	215.0	\$1,354.50

5/8" Residential connection: 360 gpd

Meter Size - per CONNECTION basis	Equivalent Ratio	Sewer
5/8	1.0	\$2,268
1	2.5	\$5,670
1-1/2	5.0	\$11,340
2	8.0	\$18,144
3 compound	16.0	\$36,288
4 compound	25.0	\$56,700
6 compound	50.0	\$113,400
8 compound	80.0	\$181,440
10 compound	115.0	\$260,820
12 compound	215.0	\$487,620

System Development Fees  
 Summary Worksheet  
 Client:

City of Locust, NC

		SEWER			
Meter Size - per GALLON Basis	Equivalent Ratio	Buy In	Incremental	Combined	Combined Total
5/8	1.0	\$9.79	\$6.30	\$16.09	\$16.09
1	2.5	\$24.48	\$15.75	\$40.23	\$40.23
1-1/2	5.0	\$48.95	\$31.50	\$80.45	\$80.45
2	8.0	\$78.32	\$50.40	\$128.72	\$128.72
3 compound	16.0	\$156.64	\$100.80	\$257.44	\$257.44
4 compound	25.0	\$244.75	\$157.50	\$402.25	\$402.25
6 compound	50.0	\$489.50	\$315.00	\$804.50	\$804.50
8 compound	80.0	\$783.20	\$504.00	\$1,287.20	\$1,287.20
10 compound	115.0	\$1,125.85	\$724.50	\$1,850.35	\$1,850.35
12 compound	215.0	\$2,104.85	\$1,354.50	\$3,459.35	\$3,459.35

		SEWER			
Meter Size - per CONNECTION basis	Equivalent Ratio	Buy In	Incremental	Combined	Combined Total
5/8	1.0	\$3,524	\$2,268	\$5,792	\$5,790
1	2.5	\$8,811	\$5,670	\$14,481	\$14,480
1-1/2	5.0	\$17,622	\$11,340	\$28,962	\$28,960
2	8.0	\$28,195	\$18,144	\$46,339	\$46,330
3 compound	16.0	\$56,390	\$36,288	\$92,678	\$92,670
4 compound	25.0	\$88,110	\$56,700	\$144,810	\$144,810
6 compound	50.0	\$176,220	\$113,400	\$289,620	\$289,620
8 compound	80.0	\$281,952	\$181,440	\$463,392	\$463,390
10 compound	115.0	\$405,306	\$260,820	\$666,126	\$666,120
12 compound	215.0	\$757,746	\$487,620	\$1,245,366	\$1,245,360

**System Development Fees  
Growth Projections Worksheet**

Client: City of Locust, NC

**CITY GROWTH**

<i>Percent Annual Growth</i>	5.00%	5.00%	5.00%	5.00%
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<b>Total Sewer Connections</b>				
<b>Year</b>	<b>Residential</b>	<b>Commercial</b>	<b>Institutional</b>	<b>Industrial</b>
2020	1,274	123	11	0
2021	1,338	129	12	0
2022	1,405	136	12	0
2023	1,475	142	13	0
2024	1,549	150	13	0
2025	1,626	157	14	0
2026	1,707	165	15	0
2027	1,793	173	15	0
2028	1,882	182	16	0

System Development Fees  
 Revenues Projection Worksheet  
 Client:

City of Locust, NC

Meter Size	Sewer SDFs	
	Buy-in Method	Incremental Method
5/8"	\$ 3,524	\$ 2,268
1.5"	\$ 17,622	\$ 11,340
4" compound	\$ 88,110	\$ 56,700

Percent Annual Growth

5.00%	5.00%	5.00%	5.00%
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Year	Total Sewer Connections			
	Residential	Commercial	Institutional	Industrial
2020	1,274	123	11	-
2021	1,338	129	12	-
2022	1,405	136	12	-
2023	1,475	142	13	-
2024	1,549	150	13	-
2025	1,626	157	14	-
2026	1,707	165	15	-
2027	1,793	173	15	-
2028	1,882	182	16	-
<b>TOTAL</b>				

Year	Sewer Revenues from Buy-In Cost Method				
	Residential (5/8")	Commercial (1.5")	Institutional (4 compound)	Industrial (1.5")	TOTAL
2020					
2021					
2022					
2023					
2024	\$ 260,806	\$ 123,354	\$ 88,110	\$ -	\$ 472,270
2025	\$ 271,379	\$ 123,354	\$ 88,110	\$ -	\$ 482,843
2026	\$ 285,476	\$ 140,976	\$ 88,110	\$ -	\$ 514,562
2027	\$ 299,574	\$ 140,976	\$ 88,110	\$ -	\$ 528,660
2028	\$ 317,196	\$ 158,598	\$ 88,110	\$ -	\$ 563,904
<b>TOTAL</b>	<b>\$ 1,434,431</b>	<b>\$ 687,258</b>	<b>\$ 440,550</b>	<b>\$ -</b>	<b>\$ 2,562,239</b>

Year	Sewer Revenues from Incremental Cost Method				
	Residential (5/8")	Commercial (1.5")	Institutional (4 compound)	Industrial (1.5")	TOTAL
2020					
2021					
2022					
2023					
2024	\$ 167,832	\$ 79,380	\$ 56,700	\$ -	\$ 303,912
2025	\$ 174,636	\$ 79,380	\$ 56,700	\$ -	\$ 310,716
2026	\$ 183,708	\$ 90,720	\$ 56,700	\$ -	\$ 331,128
2027	\$ 192,780	\$ 90,720	\$ 56,700	\$ -	\$ 340,200
2028	\$ 204,120	\$ 102,060	\$ 56,700	\$ -	\$ 362,880
<b>TOTAL</b>	<b>\$ 923,076</b>	<b>\$ 442,260</b>	<b>\$ 283,500</b>	<b>\$ -</b>	<b>\$ 1,648,836</b>

Year	Sewer Revenues from Combined Cost Method				
	Residential (5/8")	Commercial (1.5")	Institutional (4 compound)	Industrial (1.5")	TOTAL
2020					
2021					
2022					
2023					
2024	\$ 428,638	\$ 202,734	\$ 144,810	\$ -	\$ 776,182
2025	\$ 446,015	\$ 202,734	\$ 144,810	\$ -	\$ 793,559
2026	\$ 469,184	\$ 231,696	\$ 144,810	\$ -	\$ 845,690
2027	\$ 492,354	\$ 231,696	\$ 144,810	\$ -	\$ 868,860
2028	\$ 521,316	\$ 260,658	\$ 144,810	\$ -	\$ 926,784
<b>TOTAL</b>	<b>\$ 2,357,507</b>	<b>\$ 1,129,518</b>	<b>\$ 724,050</b>	<b>\$ -</b>	<b>\$ 4,211,075</b>