TOWN OF SHALLOTTE

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June 7, 2022

Linda Culpepper
Project Manager- Viable Utility Unit
Division of Water Infrastructure/Department of Environmental Quality
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Ms. Culpepper,

The Town of Shallotte (Town) is seeking designation as a non-viable distressed unit based on financial challenges that affect the systems technical and managerial abilities impacting the long-term sustainability of the water utility. Further details regarding these challenges can be found in Attachment (1).

The Town has partnered with Brunswick County for a future consolidation and intends to conduct construction projects that have been identified as critical for the future systems consolidation but has need for state grant assistance to carry out the priority projects. Attachment (3) contains a Memorandum of Understanding documenting this commitment which was included in the Town's spring funding application submitted to the Division of Water Infrastructure on May 2, 2022.

The Town has already completed substantial planning efforts financially supported by the Division of Water Infrastructure, including Asset Inventory and Assessments for both systems (Attachment (2)), and has begun the process for Merger and Regionalization Feasibility Study for the water system (Attachment (4)), whose results support future system consolidation.

If designated as distressed, the Town will complete the viable utility requirements in §159G-45(b) by:

1. Conducting an asset assessment and rate study. (completed in 2021)
2. Participate in a training and educational program. (Town applied for training funding within a construction application Spring 2022)
3. Develop a short-term and long-term action plan considering all of the following:
    a. Infrastructure repair, maintenance, and management.
    b. Continuing education of the governing board and system operating staff.
    c. Long-term financial management plan.

Attachment (5) contains a resolution codifying our commitment above approved by the Town Council at its June 7th meeting. We're hopeful this letter and supporting documentation demonstrate the Town's needs and commitment to adhering to the recommendations of the studies previously funded by DWI to regionalize our water utility into a viable and sustainable asset for our residents.

Sincerely,

Maria Gaither, Town Manager
Town of Shallotte

Attachment – 1

Financial, Managerial, and Technical Challenges and Relevant Attachments

Financial

The Town of Shallotte has owned and operated a water system for over 40 years. Although the system is aging the Town has been able to maintain it with a healthy reserve fund in place. The Town completed an Asset Inventory and Assessment (attached) for both their water and sewer system in March 2021. Recommendations from that study were that Shallotte should increase its water rates by 30 % in 2022, 30% in 2023, 20% in 2024 and 15% in 2025 to pay for a number of needed capital improvement projects that were needed due to age and deterioration of the system. Given the age of Shallotte's system those findings were not surprising. The Town was prepared to make these increases to continue to maintain and operate the system, which alone would be significant for the system users to absorb.

However, the primary factor that has impacted the Town's ability to financially support the water system is the recent increase in the cost of water. The Town purchases water from Brunswick County and has done so for over 40 years. In 2021, the Town was notified that the County would be increasing the cost of wholesale water by approximately 80%. The primary reason for the cost increase was the need for the County to build a reverse osmosis water treatment plant to address water contamination issues related to chemical spills into the Cape Fear River from the company Chemour. This increase in water cost has required the Town to adopt a rate structure that places a burden on residents and halts economic growth opportunities. Not only has the Town raised its rates to match the County's rates, but in order to keep cost as low as possible for residents the Town, with Local Government Commission (LGC) consultation, has been supplementing the rates out of the current reserve fund. The LGC only approved this to be done if the Town agreed to work with Brunswick County to consolidate the systems.

For the period of January 1, 2022, to January 1, 2026, the water portion of a low residential user (6000 gallons bimonthly) would increase from $35.98 to $111.64. For a commercial restaurant 263,866 gallons bimonthly), the water portion of their bill would increase from $1,847.22 to $5,010.14.

Bi-Monthly Water Usage	January 1, 2022	January 1, 2026
Residential 6,000 Gallons Water	$35.98	$111.64
Commercial Restaurant 263,866 Gallons Water	$1,847.22	$5,010.14

The Town had to make the difficult decision of determining if it is financially feasible to continue to own and operate the water system. There are only 1,915 (in town) and 355 (out of town) water customers to bear the burden of these cost. The required rate increases to meet capital needs, maintenance, and water cost made it clear that a merger was in the best interest of the Town and the residents. The Town, in conjunction with Brunswick County, applied for a merger regionalization study in 2021 which was awarded in 2022 and that process is now underway. Also, as part of the LGC's requirements, the Town entered into discussions with Brunswick County regarding merger efforts, and a Memorandum of Understanding was agreed upon and recently executed (attached).

Attached are comparison charts of the Town's projected rate increases and the impacts of the increased rates on users. Also attached is a dashboard comparison that compares Shallotte with others local governments similar in size.

Managerial

The Town has limited staff that are dedicated to operating and maintaining the water system. Although, not without challenges, the Town has been able to maintain and operate the system with the current staff levels. That will become a challenge if the financial burdens continue, and funds are not adequately set aside for basic maintenance and repair of the water infrastructure and equipment.

Technical

The Town of Shallotte has prudently managed and maintained its water system and has not been distressed. It is important to note, however, that the Shallotte water system is over forty years old and some of its components are nearing the end of their useful life. Within the past year, the AIA findings and the Brunswick County water supply cost increases have dramatically changed the current situation for Shallotte. It is the combination of these two factors that support the conclusion that Shallotte's water system has transitioned into a distressed state.

Attachment – 2

Asset Inventory and Assessment

ASSET MANAGEMENT PLAN

WATER AND SEWER INFRASTRUCTURE | MARCH 2021

712 Village Road SW; Suite 103
Shallotte, North Carolina 28470
Firm License No.: C-0459

McGill Project No. 18.07058

Thank you to the Town of Shallotte Asset Management Team who helped put this together.

Mimi Gaither, Town Administrator; Debra Horn CZO, Development and Regulatory Compliance Manager; Robert Waring, Assistant Town Administrator/Development Services Director; Chuck Denely, Public Services Crew Leader; Paul Dunwell, Fire Chief; David Bowman PE, Town Engineer; and the McGill Team: Michael Norton PE, Shallotte Office Manager; Donald Covil PE, Project Manager; Alex Lapinsky PE, Senior Project Manager; Nate Bowe PE GISP, Project Manager; RJ Mozeley PE, Project Manager; Mike Dowd PE, Project Manager; Kyle Seaman PE, Project Manager; Zachary Roman PE, Project Engineer; and Tony Mintz, CADD Operator

Special acknowledgment is given to the North Carolina Division of Water Infrastructure for funding this project through the Asset Inventory and Assessment Grant Program

Asset Management Plan | Water and Sewer Infrastructure

Town of Shallotte, North Carolina

Table of Contents

Appendices

A. Historical Water Distribution System Maps
    1. Shallotte “Downtown Streets” Historic Map
    2. “Town of Shallotte – Brunswick County, NC” Map Book - Hobbs, Upchurch & Associates, P.A.
    3. Master Water System Map – David Bowman, PE

B. Historical Sewer Collection System Maps
    1. Overall Sewer Collection System Master Plan – David Bowman, PE

C. Water: Hydraulic Model Maps & Information

D. Water Distribution System Asset Inventory and Assessment Tables

E. Sewer Collection System Asset Inventory and Assessment Tables

F. Water: Updated Town Capital Improvements Plan & Itemized Project Estimates

G. Sewer: Capital Improvements Plan Projects & Itemized Project Estimates

List of Acronyms and Abbreviations

AC	Asbestos Concrete Pipe
AIA	Asset Inventory & Assessment
AMP	Asset Management Plan
BCPU	Brunswick County Public Utilities
CI	Cast Iron Pipe
CIP	Capital Improvements Plan
DBP	Disinfection Byproducts
DENR	North Carolina Department of Environment and Natural Resources
DIP	Ductile Iron Pipe
DWI	North Carolina Division of Water Infrastructure
DWR	North Carolina Division of Water Resources
EID	Environmental Information Document
GPM	Gallons Per Minute
HAA	Haloacetic Acids
HGL	Hydraulic Grade Line
MCL	Maximum Contaminate Level
MGD	Million Gallons per Day
NCDEQ	North Carolina Department of Environmental Quality
NCDOT	North Carolina Department of Transportation
NCDWI	North Carolina Division of Water Infrastructure
O&M	Operations and Maintenance
PWS	Public Water System
PVC	Polyvinyl Chloride Pipe
SCADA	Supervisory Control and Data Acquisition
SDC	North Carolina State Data Center
TOS	Town of Shallotte
THMs	Trihalomethanes
TTHM	Total Trihalomenthanes
USCB	United States Census Bureau

Executive Summary

Section E1: System Overview

An Asset Management Plan (AMP) is a planning document utilized by utility providers to serve as a set of guiding information, principles, and procedures to ensure the continued viability of the utility system's infrastructure. An AMP is comprised of four (4) main components: 1) Inventory of all assets including maps, 2) Assessment of the condition of the system's infrastructure inventory, 3) Capital improvements planning with individual projected costs, 4) Operations and Maintenance (O&M) plan. These elements combine to equip the utility provider with a practical tool for use in understanding their system's infrastructure, its current condition, the expected improvements necessary to replace individual components, and how to operate and maintain the system. An AMP is indicative of a utility system that provides a high level of service with minimal interruption and operates on sound financial planning to provide itself with a secure future.

The AMP is designed to be a living document that will be updated at regular intervals with new data for the asset inventory and condition assessments, changes to the Capital Improvements Plan (CIP), and amendments to the Operations and Maintenance (O&M) plans as needed. The baseline of TOS's asset management plan is its level of service statement. The premise of this level of service statement is to *provide reliable water distribution services and sewer collection services at a minimum cost while being compliant with all state and federal regulations*.

E1.1 Water Distribution System

The TOS has resolved to be proactive in planning for and anticipating continued growth of commercial development and residential neighborhoods that depend on the water service that the Town provides. Currently, TOS is home to over 4,700 residents, has over six hundred and ten (610) businesses, and is actively recruiting new commercial users for future development and growth. To efficiently provide water services to residents and businesses today and in the future, the TOS developed this AMP.

E1.2 Sewer Collection System

The TOS desires to maintain a high level of service for its sewer collection system and keep the system operating efficiently. The TOS Public Works Department is responsible for the operation and maintenance of the sewer collection system up until the wastewater treatment facility (WWTF), which is operated by Brunswick County. Approximately 380,000 gallons of wastewater is pumped from the collection system's customers to the wastewater treatment facility daily. The TOS anticipates continued growth in the community moving forward and its system-wide goal is to continue meeting the current daily demand while maintaining the collection system's integrity

to serve the future anticipated growth in the community. The AMP is structured to aid the TOS in accomplishing its goals for the sewer collection system in the present as well as the future.

Section E2: Inventory of Assets

E2.1 Water Distribution System

The foundation of the asset management plan is the inventory and condition assessment of the water distribution and sewer collection systems' infrastructure. The Shallotte Public Water System (PWS) (PWS ID 04-10-025) receives its water supply from Brunswick County through three (3) metering vaults: the "Washington Street Vault", the "Highest Praise Vault", and the "Home Depot Vault". Each of the vaults are located at boundary points within the Shallotte PWS where the Town's water mains interconnect with Brunswick County's water mains. Shallotte's PWS is currently comprised of approximately 57 miles of water mains varying in sizes from 2 - 12 inches in diameter. The ground elevations within the Shallotte PWS range from 5 ft. to 45 ft. above sea level. The hydraulic grade line (HGL) elevation of the TOS water system is at approximately 184 feet.

Shallotte's public works staff is responsible for managing the physical infrastructure within the water distribution system. This entails day-to-day operations and maintenance activities; along with addressing customer complaints, system leaks, and point failures (line breaks). Such intermittent repair efforts are a regular impediment for public works staff in accomplishing their normal duties and carry a significant price tag. The development of this AMP is a critical step in the process of providing a comprehensive list of the water distribution system's infrastructure and an assessment of the system's current condition as the TOS aims at maintaining its level of service agreement.

E2.2 Sewer Collection System

The TOS's sewer collection system is recognized as permit # WQCS00296 by the DWR. The total length of the collection system is about 73 miles. The collection system consists of approximately 15 miles of gravity sewer, approximately 29 miles of pressure sewer, and about 28 miles of force main. The TOS also manages 25 major lift stations within the collection system that serve to transport wastewater to the WWTF. In addition to these major lift stations there are also 675 concrete septic systems with wet wells within the system that pump into the pressure sewer network. Approximately 380,000 gallons of wastewater is pumped daily into the Brunswick County wastewater treatment facility; the TOS does not operate or maintain the treatment facility. The ownership of the WWTF was transferred from the TOS to Brunswick County in the past two decades; Brunswick County is now solely responsible for the wastewater treatment facility. The wastewater treatment facility the TOS sewer collection system pumps to is a facultative lagoon, non-discharge facility with a treatment capacity of 500,000 gallons.

The TOS Public Works Department is responsible for managing the sewer collection system. These responsibilities include regular maintenance of the collection system's assets, daily monitoring of lift stations, and cleaning of the system's lines. Public works staff respond to sewer overflow situations and completes the necessary remedial actions. The TOS public works staff also responds to calls from customers whose household pump station requires maintenance and completes the necessary repairs to ensure the pump station is functioning properly. The frequency with which town staff must respond to maintenance calls from customers makes it challenging for staff to carry out all their responsibilities for the operation and maintenance of the collection system.

Section E3: Condition Assessment

E3.1 Water Distribution System

Following completion of the inventory of the Town's water system infrastructure, the third step of the AMP was to review said inventory and develop an assessment of the current condition for each component in the Town's system. That condition assessment was built through an in-depth review of each facility and component by the AMP project team, with the primary input coming from the Town's public works and operations staff.

Assessment of the Town's existing water distribution system infrastructure was completed by collecting information through direct inspections, operator experience and knowledge, and historic system records and maps. The completed *condition assessment takes into consideration both the potential for failure and the criticality of the assets* to develop an eventual priority ranking of each facility component. This ranking, referred to as the Risk-Consequence Rating serves as the basis to compare a particular component from the system inventory to others in the Town's utility systems. This eventual comparison of all components in the Town's utility systems then provided guidance to the AMP team in developing a list of proposed Capital Improvements to implement over the project planning period (10-years).

E3.2 Sewer Collection System

The condition assessment of the TOS's sewer collection system followed the same procedures outlined above for the water distribution system. The condition assessment was completed once an inventory of TOS sewer collection system assets was completed. The Town provided detailed information including as-built plans, maintenance records, sewer overflow records, construction dates, and information about specific asset characteristics for use in the condition assessment. All the aforementioned information was organized and subdivided so that each individual asset could be analyzed with the highest quality and most robust information associated with it. In addition to the data provided by the TOS the AMP team also carried out visual inspections of manholes during the asset inventory collection phase of the project. A major component of the condition assessment phase was the completion of smoke testing on portions of the TOS's gravity sewer system. In consultation with TOS staff areas with known or

suspected inflow and infiltration were determined and scheduled to be smoke tested. All observations taken during the smoke tests were incorporated into the condition assessment of the sewer collection system. The smoke testing of portions of the gravity sewer system within the TOS also provided condition information as a visual inspection of assets also took place during the smoke tests. TOS Public Works staff members were also consulted to gain additional insight into the sewer collection system. In particular, staff members were asked about events which would indicate a diminishing asset condition (sewer overflows, line breaks, etc.). The information resulting from the condition assessment was used along with Town recommendations to determine a list of proposed projects to be included in the Town's CIP.

Section E4: Hydraulic Modeling of Water Distribution System

To evaluate the existing water system, as well as analyze the potential impact of proposed improvements, a base water distribution system model for the Town was developed. The model was developed using Bentley WaterGEMS computer software. For all analysis, the model was run for "steady-state" conditions only. "Steady-state" conditions assume a constant supply, demand, and pressure for the system all at a snapshot in time. The model was also used to evaluate the anticipated improvements on the TOS CIP, and to develop other potential projects for the TOS water system. Hydraulic model maps and information can be found in Appendix B.

Section E5: Capital Improvements Plan Updates

E5.1 Water Distribution System

Following the condition assessment for the Town's water distribution system's infrastructure, the Capital Improvements Plan (CIP) provides the next building block of the AMP and it reflects the planned capital improvements over the next ten (10) years. The existing, pre-AIA 2019 TOS CIP is illustrated in Table E5.1. The AIA team acknowledges that the CIP will be a separate document.

E5.2 Sewer Collection System

The CIP updates related to the sewer collection system were completed once the condition assessment of select TOS sewer assets was completed by the AMP team. The CIP update completed for the water distribution system phase was utilized as the base for the sewer collection system CIP updates. No adjustments were made to the water utility section of the CIP during the sewer collection system CIP updates; the values from the water distribution system CIP update are identical to what is shown in the sewer collection system CIP update. A period of ten (10) years was utilized for planning the proposed CIP projects. The updates to the CIP were based on the results of the condition assessment of TOS sewer system assets and

discussions with TOS staff members regarding potential projects that the TOS would like to have completed to ensure the highest degree of sewer collection system functionality. A financial analysis of the TOS's sewer rates will be prepared under separate cover and will utilize the information included in the new CIP. The sewer rate update project is not included in the scope of this AMP.

Town of Shallotte
Capital Improvement Plan

Table E5.1

Shallotte Capital Improvement Plan Projects

	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	Totals
Administration							
Equipment - Vehicle	$ -			$ -	$ 30,000.00		$ 30,000.00
Equipment - Software	$ -	$ -	$ -	$ 50,000.00	$ -		$ 50,000.00
Personnel - Receptionist/Billing/Adm Asst	$ 40,000.00		$ -	$ -	$ -	$ 40,000.00	$ 80,000.00
Total Administration	$ 40,000.00	$ -	$ -	$ 50,000.00	$ 30,000.00	$ 40,000.00	$ 160,000.00
Planning							
Service - Land Development Code		$ 40,000.00	$ -	$ -	$ -		$ 40,000.00
Equipment - Zoning Vehicle			$ 25,000.00	$ -	$ -		$ 25,000.00
Personnel - Code Enforcement Officer	$ 40,000.00						$ 40,000.00
Personnel - Zoning Officer		$ -	$ 50,000.00	$ -	$ -		$ 50,000.00
Total Planning	$ 40,000.00	$ 40,000.00	$ 75,000.00	$ -	$ -	$ -	$ 155,000.00
Police							
Equipment - 3 Equipped SUV	$ 125,000.00	$ -	$ 128,000.00	$ -	$ 128,000.00		$ 381,000.00
Equipment - 2 Equipped SUV	$ -	$ 82,000.00	$ -	$ 86,000.00	$ -		$ 168,000.00
Equipment - AFIS Live Finger Print System		$ 12,000.00	$ -	$ -	$ -		$ 12,000.00
Equipment - Wireless City Cameras	$ 26,000.00	$ 12,000.00	$ -	$ -	$ -		$ 38,000.00
Personnel - Drug Officer	$ 61,950.00	$ -	$ -	$ -	$ -		$ 61,950.00
Personnel - Patrol Officer	$ -	$ -	$ 59,850.00	$ 59,850.00	$ -		$ 119,700.00
Zuercher Public Safety Software		$ 73,000.00					$ 73,000.00
							$ -
Total Police	$ 212,950.00	$ 179,000.00	$ 187,850.00	$ 145,850.00	$ 128,000.00	$ -	$ 853,650.00
Fire							
Apparatus - 1500 ggm Rescue/Pumper	$ 380,000.00	$ -	$ -	$ -	$ -		$ 380,000.00
Apparatus - 1500 ggm Rescue/Pumper	$ -	$ -	$ -	$ 439,897.00	$ -		$ 439,897.00
Apparatus - Aid SUV (VFIS Replacement	$ 35,684.00	$ -	$ -	$ -	$ -		$ 35,684.00
Equipment - SCBA Air Compressor & Cascade	$ 90,000.00	$ -	$ -	$ -	$ -		$ 90,000.00
Equipment - Hydraulic Ext Tool - Em purchase	$ 23,000.00						$ 23,000.00
Facility - Brierwood Station Dev.Dependant	$ -	$ -	$ 1,200,000.00	$ -	$ -		$ 1,200,000.00
Personnel - Firefighter	$ 46,000.00	$ -	$ -	$ -	$ -		$ 46,000.00
Personnel - Firefighter	$ 46,000.00	$ -	$ -	$ -	$ -		$ 46,000.00
Personnel - Deputy Chief						$ 55,000.00	$ 55,000.00
Personnel - Administrative Asst					$ 40,000.00		$ 40,000.00
Total Fire	$ 620,684.00	$ -	$ 1,200,000.00	$ 439,897.00	$ 40,000.00	$ 55,000.00	$ 2,355,581.00
Street							
Project - Trees on Main		$ 10,000.00	$ 10,000.00	$ 10,000.00	$ -		$ 30,000.00
Project - Decorative Lights on Main	$ -	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00		$ 80,000.00
Project - Widen White St - Shallotte Ave to Smith	$ -		$ -	$ 67,700.00	$ -		$ 67,700.00
Project - Service Road around Bypass	$ -	$ -	$ 500,000.00	$ 500,000.00	$ -		$ 1,000,000.00

Project - Stormwater Study	$ -	$ -	$ 40,000.00	$ -	$ -	$ 40,000.00

	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23		Totals
Street Cont.							
Project - Sidewalk Phase II	$ 125,000.00	$ -	$ -	$ -	$ -		$ 125,000.00
Equipment - Dump Truck	$ 75,000.00	$ -	$ -	$ -	$ -		$ 75,000.00
Equipment - Boom Mower	$ -	$ -	$ 25,000.00	$ -	$ -		$ 25,000.00
Personnel - Street Maintenance Mechanic	$ -	$ -	$ -	$ -	$ 45,000.00		$ 45,000.00
Total Street	$ 200,000.00	$ 30,000.00	$ 595,000.00	$ 597,700.00	$ 65,000.00	$ -	$ 1,487,700.00
Park							
Project - Property Acquisition	$ 100,000.00						$ 100,000.00
Project - Demo Parking King Parcel	$ 85,000.00	$ -	$ -	$ -	$ -		$ 85,000.00
Project - Walking Trail	$ -		$ -	$ -	$ -	$ 35,000.00	$ 35,000.00
Project - Picnic Shelter	$ -		$ 100,000.00	$ -	$ -		$ 100,000.00
Project - Price Landing @ Mulberry Park		$ 500,000.00				$ 250,000.00	$ 750,000.00
Project - Widen Mulberry - Parking		$ -	$ 250,000.00	$ -	$ -		$ 250,000.00
Personnel - Landscape Technician	$ -	$ -	$ 45,000.00	$ -	$ -		$ 45,000.00
							0
Total Park	$ 185,000.00	$ 500,000.00	$ 395,000.00	$ -	$ -	$ 285,000.00	$ 1,365,000.00
Total General Fund	**$ 1,298,634.00**	**$ 749,000.00**	**$ 2,452,850.00**	**$ 1,233,447.00**	**$ 263,000.00**	**$ 380,000.00**	**$ 6,376,931.00**

Town Capital Improvement Funding Sources	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23		Totals
Fund Balance	$ 213,000.00	$ 10,000.00	$ 400,000.00				$ 623,000.00
Debt Proceeds	$ 380,000.00	$ -					$ 380,000.00
Grant		$ 320,000.00					$ 320,000.00
Other	$ 30,684.00		$ 1,200,000.00	$ 439,897.00			$ 1,670,581.00
Pay as you go	$ 674,950.00	$ 419,000.00	$ 852,850.00	$ 793,550.00	$ 263,000.00	$ 380,000.00	$ 3,383,350.00
Total Funding	**$ 1,298,634.00**	**$ 749,000.00**	**$ 2,452,850.00**	**$ 1,233,447.00**	**$ 263,000.00**	**$ 380,000.00**	**$ 6,376,931.00**

Town of Shallotte
Capital Improvement Plan

	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23		Totals
Water							
Equipment - Tool Cat	$ -	$ -	$ 50,000.00	$ -	$ -		$ 50,000.00
Project - Line Main to Riverfront		$ 300,000.00	$ -	$ -	$ -		$ 300,000.00
Project - Loop Northside	$ -	$ -	$ 200,000.00	$ -	$ -		$ 200,000.00
Project - Loop Highlands	$ -		$ -	$ 200,000.00	$ -		$ 200,000.00
Project - Loop Birch Pond to 12 on Bypass	$ -	$ 250,000.00	$ 250,000.00		$ -		$ 500,000.00
Project - Relocate Water Smith Bypass			200,000.00				
Personnel - Utility Maintenance Mechanic	$ -			$ -	$ 45,000.00		$ 45,000.00
Total Water	$ -	$ 550,000.00	$ 700,000.00	$ 200,000.00	$ 45,000.00	$ -	$ 1,495,000.00
Sewer							
Equipment - Pump Truck	$ -		$ 120,000.00	$ -	$ -		$ 120,000.00
Equipment - Backhoe	$ -	$ -	$ 100,000.00	$ -	$ -		$ 100,000.00
Equipment - Excavator / Trackhoe	$ 100,000.00	$ -	$ -	$ -	$ -		$ 100,000.00
Equipment - Mobile Compressor	$ -	$ 25,000.00	$ -	$ -	$ -		$ 25,000.00
Equipment - Pressure Line Cleaner	$ -		$ -	$ -	$ -	$ 50,000.00	$ 50,000.00
Project - 12" Line to WWTP - Reclassified to 12" to WWTP		$ -	$ -	$ -	$ -		$ -
Project - Wall St LS- Modify/Park LS		$ 500,000.00	$ -		$ -		$ 500,000.00
Project - Sewer Upgrades 875 @ 5,000			$ 437,500.00	$ 437,500.00	$ 437,500.00	$ 437,500.00	$ 1,750,000.00
Project - Lines from Park to Main			$ 190,000.00	$ -	$ -		$ 190,000.00
Project - Larger Lines from Main to Riverfront		$ 100,000.00	$ -	$ -	$ -		$ 100,000.00
Project - Redbug to Treatment Plant	$ -	$ 60,000.00	$ -	$ -	$ -		$ 60,000.00
Project - Larger Lines to Wtreatment Plant 12"	$ -	$ 569,000.00	$ -				$ 569,000.00
Project - Relocate Sewer Smith Bypass			$ 200,000.00				
Project - Mulberry Pump Station			$ 430,000.00				
Project - White Sewer			$ 57,000.00				
Personnel - Utility Maintenance Mechanic	$ -	$ -	$ -		$ -	$ 45,000.00	$ 45,000.00
	$ 100,000.00	$ 1,254,000.00	$ 1,534,500.00	$ 437,500.00	$ 437,500.00	$ 532,500.00	$ 3,763,500.00
Total Water Sewer Fund	**$ 100,000.00**	**$ 1,804,000.00**	**$ 2,234,500.00**	**$ 637,500.00**	**$ 482,500.00**	**$ 532,500.00**	**$ 5,258,500.00**

Town Capital Improvement Funding Sources	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	Totals
Fund Balance							$ -
Debt Proceeds		$ 969,000.00	$ 310,000.00				$ 1,279,000.00
Grant			$ 430,000.00				$ 430,000.00
Other			$ 837,500.00	$ 437,500.00	$ 437,500.00	$ 437,500.00	$ 2,150,000.00
Pay as you go	$ 100,000.00	$ 835,000.00	$ 657,000.00	$ 200,000.00	$ 45,000.00	$ 95,000.00	$ 1,932,000.00
Total Funding	**$ 100,000.00**	**$ 1,804,000.00**	**$ 2,234,500.00**	**$ 637,500.00**	**$ 482,500.00**	**$ 532,500.00**	**$ 5,258,500.00**

Section E6: Operations & Maintenance Plan

The Town of Shallotte's public works staff has developed an Operations and Maintenance Plan (O&M Plan) that they follow daily. This general plan includes a broad overview of their system, as well as the more specific O&M plans and manuals for individual components of the Town's facilities. O&M Plans are readily accessible to the operating staff and are used as a guide for standard operating procedures and emergency situations.

This AMP document reinforces the previous and current efforts in the O&M process by assembling policies and procedures to follow. Overall, those procedures include:

- Maximizing planned maintenance and minimizing unplanned maintenance
- Directing Town personnel to any equipment manufacturer's recommended maintenance schedule
- Maintaining a frequent inspection program to identify potential failures
- Involving field crews in maintenance planning
- Depict and instill widely accepted industry standards for the Town's infrastructure
- Ensuring field crews are properly trained to perform required tasks adequately and efficiently
- Provide formal training on standard procedures, standard equipment, and standard safety practices
- Complete regular inspection and maintenance reports

Implementation of the daily tasks associated with this AMP document and continual review of normal operating procedures while searching for ways to improve the level of service will ensure consistent and systematic operations for the Town's public utility systems in the years ahead.

Section 1: Overview/Level of Service Statement

The Town of Shallotte's fundamental desired level of service is to provide reliable water distribution services and sewer collection services at a minimum cost while being compliant with all state and federal regulations.

For both the water distribution system and the sewer collection system, the specific level of service goals are to:

- Provide notifications to the public in a timely manner, including annual water and sewer quality reporting
- Provide rapid and effective emergency response services
- Minimize cost and maximize effectiveness of operations and maintenance program

For the water distribution system, specific level of service goals are to:

- Provide adequate water pressure throughout the system
- Minimize water loss throughout the system

For the sewer collection system, specific level of service goals are to:

- Provide wastewater drainage throughout the system
- Minimize inflow and infiltration into the system

The Town will track its progress towards meeting the desired level of service goals by using the following performance measurements:

- Establish public notification guidelines for scheduled shutdowns, non-scheduled shutdowns, emergency shutdowns, and annual reports
- Establish maximum emergency response time to emergency calls, track customer complaints and claims for private property restoration

Section 2: Inventory of Assets

The asset inventory is at the core of the Asset Management Plan because it is the foundation of the Condition Assessment, the Capital Improvements Plan, and the Operations and Maintenance Plan. This asset inventory is focused on identifying what TOS owns, its current condition, remaining useful life, and its replacement cost.

This initial inventory was developed by using available as-built drawings and system records to then determine quantity, location, and approximate age of the existing assets. Observations were made of above ground assets, and the Town's maintenance crews were involved in discussions to better identify existing assets and their current conditions.

2.1 Water Distribution System

Water enters the TOS PWS through three (3) master meter vaults. Each of the vaults are located at boundary points within the Shallotte PWS where the Town's water mains interconnect with Brunswick County's water mains. As of 2018, Shallotte's water distribution system serves:

- Number of current connections in water system: 2,331
- Average daily demand: 0.442 MGD
- Maximum daily demand: 0.772 MGD

The water that enters the TOS PWS from the BCPU distribution system originates from a 4,000,000-gallon ground-level tank located adjacent to US 17 in Bolivia, NC and from an elevated tank at Shallotte Township Park. The aforementioned water flows through a booster pump station also located in Bolivia, NC, through the BCPU transmission main, and into the meter vaults.

The inflows through the meter vaults increase at certain times of the year. During the months of May through September, the BCPU booster pump station on Washington Street will activate in concert with the booster pump station in Bolivia, to meet the increase in demands caused by tourism. The feeds may also increase during these months to maintain a larger volume of water in the BCPU elevated tanks located within the TOS limits.

Water Mains

The first water mains were installed in Shallotte in the 1960s. Asbestos cement, ductile iron, and polyvinyl chloride pipes are all found throughout the Town's water distribution system. The following table, "2.1 Water Main Inventory Summary," outlines the basic statistics of Shallotte's water mains and related apparatuses. Historic system maps, current system maps, and a complete system inventory are in Appendix A.

Table 2.1 Water Main Inventory Summary			
Pipe Diameter (in.)	**Number of Valves**	**Number of Hydrants**	**Pipe Length (ft.)**
2 in	18	0	6,466
3 in	2	0	3,818
4 in	1	0	1,282
6 in	343	182	150,898
8 in	248	113	93,845
12 in	68	35	42,447
unknown	3	6	591
Totals	**683**	**336**	**299,347**
Total Miles of Water Mains			**56.6**

2.2 Sewer Collection System

All wastewater collected within the TOS is transported via its sewer collection system to a wastewater treatment facility located within the Town's corporate limits. The wastewater treatment facility is operated and maintained by Brunswick County. Responsibility of the facility was previously transferred from the TOS to Brunswick County. Approximately 73 miles of sewer lines comprise the TOS's sewer collection system. About 28 miles of force main, 15 miles of gravity sewer, and 29 miles of pressure sewer combine to make up the system. 8 force mains act as the primary means of moving wastewater from the areas served by gravity sewer and pressure sewer to the wastewater treatment facility. Various appurtenances related to the TOS's force mains existing along the various runs of the force main, including air releases valves, plug valves, and gate valves. The pressurized sewer collection system which feeds into the TOS's force mains primarily consists of smaller diameter PVC pipes that originate at TOS maintained simplex and duplex pump stations and terminate at the one of the 25 major lift stations in the Town. The gravity sewer portion of the overall collection system consists of primarily 8-inch PVC pipe that transports wastewater to one of the 25 major lift stations in the Town. Areas served by the TOS's gravity sewer system also contain PVC cleanouts and PVC sewer services that connect the structure being served to the main gravity sewer system. A detailed breakdown of sewer collection system assets and information is included in the appendices of this report.

Section 3: Condition Assessment

The condition assessment was completed concurrently with the asset inventory to assess the age, condition, capacity, failure history, likelihood of failure in the future, and its criticality to the community. This was done by collecting information from direct inspections, operator experience and knowledge, and historic system records and maps.

The completed condition assessment takes into consideration both the potential for failure and the criticality of the assets. The condition of the asset is used to determine the risk for failure. The location of the asset within the system determines its criticality and the consequence in the event of failure. Together a risk-consequence evaluation was completed to determine next steps in the capital improvement plan and the operations and maintenance plan. (United States Environmental Protection Agency, 2016)

The relationship between condition and consequence of failure can be seen in Figure 3.1.1. Assets whose risk of failure are rated high and the consequence in the event of failure is high then become highly visible to management, high priority in the maintenance plan, and are included in the capital improvement plan. Lower priority assets would receive low priority for additional inspection and priority for repair, rehabilitation, or replacement.

The condition assessment that was completed as a part of the Asset Management Plan covered the fundamental components of the TOS's water and sewer systems. However, the condition of

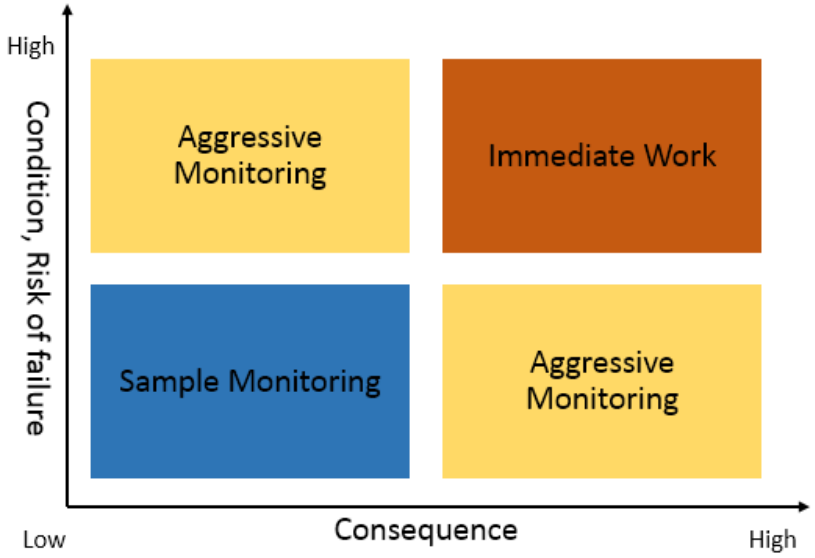


Figure 3.1.1: Relationship of Risk-Consequence to Work Program (United States Environmental Protection Agency, 2016)

all assets should continually be monitored on a frequent basis.

McGill Associates evaluated Shallotte's assets based on the known age, material, capacity, history of failure, and potential for failure to determine its condition rating based on the following 5-point scale (Table 3.1.1).

Table 3.1.1 Condition Assessment Ratings

Rating	Condition	Description	Age*	Risk of Failure
1	**Excellent**	New, perfect condition	<5 years in age	**Very Low**
2	**Good**	Minor defects only	5-20 years in age	**Low**
3	**Fair**	Backlog maintenance required	20 - 30 years in age	**Moderate**
4	**Poor**	Requires major renewal	>30 years in age	**High**
5	**Serious**	Almost unserviceable	>60 years in age	**Very High**

*Age is only a rough indicator, as an 80-year-old pipe could be in good condition while a 30-year-old pipe could be failing

The second part of the Town's condition assessment was to determine the assets' criticality to the system. Failures in the system can have large impacts on the environment, public health, transportation systems, businesses, or even be very difficult to repair. In this inventory, assets were rated high (2) or low (1) in their criticality in the system. Critical public health locations serviced by the Town's system were automatically given a value of (2) can be found in Figure 3.1.2.

Risk-consequence values were determined by multiplying condition assessment rating by the criticality value. The outcomes of the risk-consequence analysis were used to determine priority within the capital improvement plan and as actions in the operations and maintenance plan.

$$\frac{Condition\ Assessment\ Rating}{Values\ (1\ to\ 5)}\ x\ \frac{Criticality\ Value}{Values\ (1\ to\ 2)} = \frac{Risk\ Consequence\ Value}{Values\ (1\ to\ 10)}$$

Table 3.1.2 Risk-Consequence Evaluation

Risk-Consequence Value	Action
8-10	Requires immediate work
4-7	Requires aggressive monitoring
1-3	Requires sample monitoring

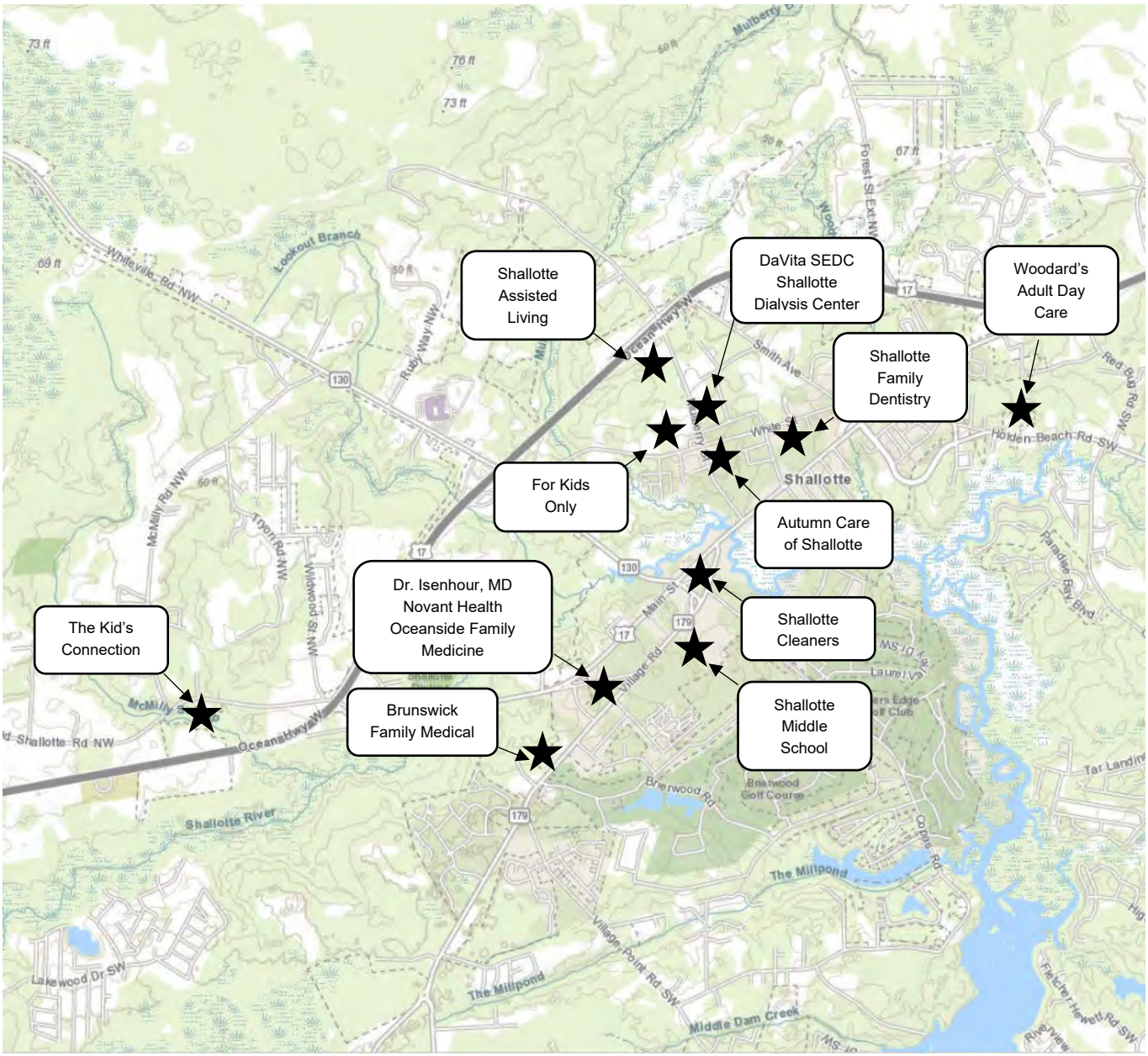


Figure 3.1.2 Critical Public Health Locations in Shallotte, North Carolina

Water Mains

Town water mains were rated using the condition assessment rankings as described above. The condition assessment map and inventory of water mains rated from high to very low for replacement/repair can be found in Appendix C.

Sewer Collection System

TOS sewer collection system assets were analyzed as described above. Sewer manholes and all lift stations were visually inspected during the inventory collection phase for signs of inflow and infiltration. All observations from the visual inspections are included in the online sewer

collection system map. Smoke testing was also conducted on portions of the TOS's gravity sewer system to locate pipe segments and structures where inflow and infiltration may be occurring. The results of the testing, included in the appendices to this report, were utilized during the condition assessment process. No criticality rating was calculated for the gravity sewer system assets due to their age and construction materials.

Section 4: Hydraulic Modeling of Water Distribution System

One of the main objectives of the AMP was to develop a hydraulic model which can aid in the planning process for the water system. With this tool, evaluation of the most prudent modifications can be simulated without the expense, length, and complication of field trials. To analyze the system hydraulically, McGill Associates utilized WaterGEMS V8*i* software (commercially available from Bentley Systems) as the basis for a computer hydraulic model. Model runs were established as a steady state system for fire flow evaluation. The model was "skeletonized" with respect to line sizes and lines included therefore only main lines – 6-inch diameter and larger – were included in the model. Dead-end remote lines (which are not critical to system hydraulics) – particularly small service lines and dedicated fire sprinkler system lines – were omitted.

WaterGEMS V8*i* utilizes model elements that reflect actual infrastructure – such as tanks, pumps, pipes, and valves. WaterGEMS also implements "junction" elements to define the ends of a pipe, to connect multiple pipes, and to represent fire hydrants. Each element is supplied a set of data (i.e., size, material, length, elevation, etc.) that mimics the characteristics of the infrastructure.

4.1 Model Elements

The calculations performed by the hydraulic model require a minimum set of data for each model element. Common to all elements are the "spatial" position (i.e., horizontal X- and Y-coordinates and vertical elevation) and an identification label.

The graphical representation, or "map", of the model was created to scale using an overlay of the Shallotte Water System. The horizontal coordinates of each element are established automatically by the software - based on the placement of the element within the bounds of the model map. Elevation data was derived from the County GIS system and available construction drawings.

Labels were automatically assigned to junctions and pipes for identification. WaterGEMS uses a relational database that tracks all data associated with an element to its unique label. Additional data, which is required for each element, is described as follows:

Junctions

Junction elements require the demand from nearby customers to simulate non-fire flow conditions in the water system. Derivation of the demand data came directly from metered usage information for a period of two (2) years and was averaged over that twenty-four (24)-month period.

Pumps

To simulate the flow and energy contribution from the Brunswick County (BC) pump stations to the Town's water system, the characteristics of the actual pumps must be defined, and the appropriate pump definition assigned to each pump element. Each pump definition reflects, at a minimum, its "pump curve". The pump curve represents the typically non-linear relationship between the discharge (Q) - usually expressed in gallons per minute (GPM) and the energy of that flow - usually expressed in feet of head (H). For clearer understanding, "head" is analogous to "pressure". The pump curve is usually defined by multiple (commonly three) Q versus H conditions. The model fits a curve to these points and simulates the discharge on the curve that corresponds to the total head the pump must overcome. Head is a function of the elevation change and friction within the system. Characteristics of the actual pumps are summarized in Appendix B.

Tanks

The operating elevation range must be defined for each tank to simulate the available head contribution from the tanks to the water system. The "base" elevation represents the ground elevation at the tank. The "minimum" elevation represents the lowest normal water surface level (in the tank) at which the pump station begins to fill it. The "initial" elevation reflects the assigned water surface level at the time of the steady-state simulation. The "maximum" elevation represents the highest normal water surface level (in the tank) at which the pump station stops filling it. The Town's water system is unique because it purchases 100% of its water from Brunswick County. The Town's water travels from Brunswick County tanks through master metering vaults. The Town's distribution system does not contain any tanks. However, there are Brunswick County tanks within the Town limits.

Pipes

Pipes are utilized to convey water from one junction in a distribution system to another and are modeled in the same manner. The flow of water through pipes, however, requires the expenditure of energy due to the friction between the walls of the pipe and the flowing water. This energy is spent or wasted through friction and is called head loss. Head loss is a function of the quantity of flow through a pipe, the length and diameter of the pipe, and its friction coefficient (C) - and is calculated using the Hazen-Williams formula. Flow is calculated from the demands on the system. The pipe distance is calculated automatically based on the spatial position of the connecting elements and is set to automatically round to the nearest one (1)-foot increment. To visually represent pump stations, tanks, and parallel pipes more clearly, some

pipe elements are shown schematically in the model map. In these cases, the realistic pipe distance is specified rather than calculated. Pipe diameter is expressed as a nominal value in inches. The friction coefficient is an empirical value associated with the pipe material. Most of the pipes in the water system are assigned a value for roughness of C = 130 as a default, but some segments are modified based on the field data collected throughout the calibration process - thereby, allowing the model results to mimic field measurements

Water Supply

The hydraulic model employs three (3) sources of water supply. Each is a reservoir-pump combination to simulate the inflow of water from BC's mains, through master metering vaults, and into the Town's distribution system. The reservoirs act as a "constant" supply of water to the Town.

Consumption and Demand

Demand data is required to simulate non-fire flow conditions throughout the system. Demand parameters for the model are generalized estimates based on an analysis of available consumption data. Shallotte and BC provided water usage data at all three of the metered water connections at the master metering vaults. Using the data obtained from both Shallotte and BC, along with Local Water Supply Plan (LWSP) data available online via Division of Water Resources (DWR), it was made possible to establish demands to be placed upon the pipe network within the water model. The physical locations associated with individual connections were evaluated and demands grouped together to common junctions, when possible.

4.2 Field Testing

When creating any hydraulic model of a distribution system, the overall goal is to develop a model that accurately mimics the distribution system's performance as it operates in the field. One critical task that must be completed to ensure the model's accuracy is the collection of field data, which is then compared with the model's results. If the comparison of hydraulic performance results between the field and model are within a reasonable margin of one another, then the model's accuracy is verified and can then be used to predict hydraulic performance under various scenarios.

To validate the water model, field tests were performed which included one (1) round of hydrant testing. Hydrant testing was conducted on both the Town's and BC's systems. The locations of the field tests were determined by McGill after examining hydraulic model.

First, "static" conditions were measured - whereby the pressure was recorded at each selected "pressure" hydrant under the influence of normal customer demands. Second, "dynamic" conditions were measured - whereby an adjacent hydrant was fully opened to achieve maximum discharge. The transient pressure waves were then allowed to dampen, and the residual pressure was measured at the pressure hydrant while the discharge was measured at the "flowing" hydrant.

Pressure measurements were made with a pressure gauge attached to one of the small (2½-inch) nozzles on the fire hydrant. Discharge measurements were made with a pressure gauge attached to a hydrant flow diffuser. Along with the pressure and flow information that was recorded, the time of each field test was recorded, which was later correlated to tank and pump status in the BC distribution system. This data was utilized to define the hydraulic model's controlling boundary conditions (i.e., water surface elevation) and pump conditions (pump on or off), termed "system boundary conditions", during each hydrant test.

The hydrant test results, and associated system boundary conditions are summarized in Table 4.3.1. Hydrant test locations are shown on the distribution system map found in Appendix C.

4.3 Model Calibration

Given the field data, modeling scenarios were created to simulate each hydrant test under the influence of its associated boundary conditions. Generally, through an iterative process, each scenario was simulated, the results were analyzed, and adjustments were made to the model parameters until the predicted results mimicked the measured results within acceptable error. It should be noted that only minimal adjustments were required to achieve an acceptable level of error on most hydrant tests. The test which did not calibrate closely has existing conditions which prevent accurate calibration without significant excavation and verification. Furthermore, the test which did not calibrate with a low degree of error was an outlier within the distribution system and is of less significance when evaluating the overall purpose of the hydraulic model.

The model results at each pressure hydrant were analyzed by considering three (3) basic comparisons. The calculated pressure was compared to the measured pressure for both static (i.e., normal demand) and dynamic (i.e., flowed hydrant) conditions. The calculated pressure spread (i.e., static pressure minus residual pressure) was also compared to the measured pressure spread.

The model results were analyzed in stages. First, the results for static conditions were analyzed. As described below, the model was corrected to minimize large discrepancies (to the extent possible). Then, the results for dynamic conditions were analyzed. The pipe friction coefficients were adjusted - as necessary and within reason - according to the best professional judgment, to approximate the same pressure difference under dynamic conditions as observed for static conditions. Refer to Table 4.3.1 (below) for information summarizing the calibration results.

Flowed Hydrant						Residual Hydrant									
Test #	Date	Time	Model Name	Measured Flow (gpm)		Model Name	Location	Measured Static Pressure (psi)		Modeled Static Pressure (psi)	Δ Static	Measured Residual Pressure (psi)		Modeled Residual Pressure (psi)	Δ Residual
								Low	High			Low	High		
HT 101	20-Aug	1:08PM				HT-101	Hydrant Tag 281	66	66	71	5				0
	20-Aug						Storage Facility Near Washington St. Vault								
HT 102	20-Aug	9:04AM				HT-102	Hydrant Tag 210	68	68	69	1				0
	20-Aug						At entrance to Home Depot off Holden Beach Rd.								
HT 103	20-Aug	8:15AM				HT-103	Hydrant Tag 272	65	65	65	0				0
	20-Aug						Entrance into The Highlands development								
HT 104	20-Aug	10:05AM				HT-104	Hydrant Tag 65	66	68	59	-7				0
	20-Aug						Hydrant across from Brierwood Entrance								
HT 105	20-Aug	1:40PM	396	570-680		HT-105	R105 - 2nd to last hydrant down Wildwood St	54	56	62	6	34	36	42	6
	20-Aug						F105 - Int. of Squirrel & Wildwood								
HT 106	20-Aug	11:05AM	192	920-960		HT-106	R106A - Main St.	66	68	72	4	60	62	67	5
	20-Aug			900-940			R106B - Across from entrance into Shallotte Park	69	69	73	4	60	64	69	5
							F106 - Across from Car Shop on Main St.								
HT 107	20-Aug	10:15AM	328	680-750		HT-107	R107 - Adjacent to pond in Heron's Nest	60	62	58	-2	30	30	31	1
	20-Aug						F107 - End of Heron's Nest								
HT 108	20-Aug	10:40AM	20	630-670		HT-108	R108A - North of Country Club Dr. Stem	70	72	66	-4	40	42	42	0
	20-Aug			630-670			R108B - South of Country Club Dr. Stem	66	70	68	2	38	42	46	4
							F108 - End of Country Club Dr. Stem								
HT 109	20-Aug	9:35AM	44	750-840		HT-109	R109 - Int. of George St. & Copas	74	76	68	-6	50	52	47	-3
	20-Aug						F109 - End of Thomas St.								
HT 110	20-Aug	8:29AM	416	750-840		HT-110	R110 - Midway down Starling Dr. in Highlands	64	66	64	0	50	50	57	7
	20-Aug						F110 - End of Starling Dr. in Highlands								
HT 111	20-Aug	9:12AM	253	920-1000		HT-111	R111 - First FH down Shallotte Crossing Pkwy at entrance near Home Depot MV	70	71	70	0	58	60	62	2
	20-Aug						F111 - Next FH down same road								
HT 112	20-Aug	8:35AM				HT-112	Hydrant Tag 264	56	56	54	-2				0
	20-Aug						Intersection of Bay Village and Forest St. Ext.								
HT 113	20-Aug	8:53AM	139	760-840		HT-113	R113 - 2nd to last FH down Express Dr.	60	60	62	2	42	42	48	6
	20-Aug						F113 - End of Express Dr.								
HT 114	20-Aug	9:55AM	323	650-750		HT-114	R114 - 2nd to last FH down Middle Dam Rd.	76	80	69	-7	36	40	32	-4
	20-Aug						F114 - End of Middle Dam Rd.								
HT 201	20-Aug	1:18PM	283	650-840		HT-201	R201 - One Hydrant back from Last Town hydrant down Old Shallotte Rd.	62	64	69	5	40	40	40	0
	20-Aug						F201 - Last Town hydrant down Old Shallotte Rd.								
HT 202	20-Aug	2:29PM	85	530		HT-202	R202 - Int. of Arnold and Northside	52	56	60	4	22	22	27	5
	20-Aug						F202 - End of Northside Dr.								
HT 203	20-Aug	2:15PM	182/65	650-750		183/66	R203A - Int. of Copas and Lake Shore	59	59	70	11	34	38	45	7
	20-Aug	2:10PM	182/65	650-750		596	R203B - FH on Copas behind Townhomes in Rivers Edge	58	60	67	7	37	40	47	7
							F203 - Int. of Copas and Fairway Crest Dr.								
BC #1	20-Aug	11:45AM		1130-1190			Washington St.	71	72	74	2	66	67		
	20-Aug						180.1 HGL								
BC #2	20-Aug	10:41AM		1060-1190			Home Depot	74	78	73	-1	72	74		
	20-Aug						216.8 HGL								
BC #3	20-Aug	10:11AM		920-1000			Highest Praise	64	64	65	1	62	62		
	20-Aug						182.6 HGL								
BC #4	20-Aug	11:15AM		920-1060			Brierwood	58	62	58	0	50	52		
	20-Aug						192 HGL								

Table 4.3.1 Hydraulic Model's Base Calibration Results

4.4 Instantaneous Scenario Findings

Observations have been made following the field and model analyses of the existing Shallotte distribution system under instantaneous scenarios. First and foremost, the Town's distribution system has sufficient fire flow capabilities within its central areas in accordance with the North Carolina Fire Prevention Code. In almost every hydrant test, the flow measured was at or more than 500 GPM with each associated residual pressure above 25 PSI.

The second takeaway from field analyses is the apparent lack of redundancy in the Town's existing system. Mains that are located towards the Town and ETJ boundaries showed lower pressures than mains that are more centrally located. If the water mains in these areas were looped, it would help increase the available pressures.

Section 5: Capital Improvements Plan Updates

The Capital Improvements Plan was developed by the Town of Shallotte Asset Management Team. The Town commissioned a separate rate analysis study which addresses the scheduling of the proposed modifications. The rate study analysis is a separate report and thus not included as part of the AMP.

5.1 Potential Water System Modifications

The Shallotte water system has operated under its current method for an extended period of time and functions adequately to provide reliable water service to its residents and businesses. There are, however, opportunities to improve a few aspects of the water distribution system's performance through proposed projects. The hydraulic model was utilized to analyze the effects of the proposed projects regarding available fire flow and residual pressures for each of the projects.

Main St. Transmission Main Addition

The first proposed construction project within the Shallotte distribution system includes the installation of an extension to the existing twelve (12) inch water main on Main Street. The extension would add redundancy to the system. Most lines on Main Street are made of AC. Installing a PVC extension on Main Street would add resiliency to the system by decreasing the probability of a major break in a heavy-traffic area of Town. Pressures within Town limits would increase up to 25 psi and the storage within the water system itself would increase.

Elevated Water Tank Addition

The proposed project within the Shallotte distribution system includes the addition of a 500,000-gallon elevated tank located at the former water tank site. This tank will provide numerous benefits. The tank would provide water storage capacity to meet North Carolina Public Water Supply requirements, improve fire flows within the area, and improve the long-term viability of the water system.

Frontage Road/US-17 South Transmission Main Addition

The second proposed construction project is the extension of the water main along US 17 South. The addition of this extension would provide more redundancy to the system at the northern edge that is currently vulnerable to outages if the existing main were to break. The extension would also include extending the existing six (6) inch water main on Smith Avenue under US 17 to tie into the proposed addition along US 17. This would provide another loop to the system as well as boost pressures for the hydrants in the vicinity by eight to ten (8-10) psi.

Highlands Water main Loop

The third proposed construction project for the water distribution system would be to extend the existing six (6) inch water main located on Cedar Ridge Road in the Green Bay subdivision. The extension would tie into the eight (8) inch water main located on Edinburgh Drive in The Highlands subdivision. Fire flows would increase in the area. The system would increase in redundancy as well.

Birch Pond to US 17 Water main Extension

The fourth proposed construction project within the Shallotte distribution system includes the extension of the existing twelve (12) inch water main on Main St. The water main extension would tie into the existing twelve (12) inch water main located on the north side of US 17. This proposed improvement would provide much needed resiliency in a heavy-commercialized area of Town.

White Street Transmission Main

The fifth proposed project includes construction of a twelve (12) inch water main on White Street and Shallotte Avenue. In addition, a twelve (12) inch water main extension from an existing main on Park Drive is also included in the proposed project. The proposed water main would tie into the existing twelve (12) inch water mains located along Smith Avenue, at the intersection of White Street and Mulberry Street, and along Park Drive.

Table 5.1 below illustrates the estimated project cost for the six (6) potential water distribution system modifications. An itemized, tabular cost estimate for each of the six (6) potential projects can be found in Appendix D.

Project Name	Estimated Project Cost
Main St. Transmission Main Addition	$ 2,068,800.00
Elevated Water Tank Addition	$ 2,209,700.00
Frontage Road/US-17 South Transmission Main Addition	$ 1,369,025.00
Highlands Water main Loop	$ 120,950.00
Birch Pond to US 17 Water main Extension	$ 473,600.00
White Street Transmission Main	$ 783,925.00

Table 5.1 Estimated Project Costs Table of Potential Water Distribution System Modifications

5.2 Potential Sewer Collection System Modifications

The following table and project descriptions represent potential improvements to the sewer collection system based on the results of the analysis of the collection system.

Project Name	Estimated Project Cost
Existing Concrete Septic Tank Replacement	$9,900.00 per replacement
Brierwood Force Main Replacement	$1,787,250.00
Downtown Force Main Replacement	$698,950.00
Annual Lift Station Components Replacement	$64,000.00 per year
Rivers Edge Subdivision, Raise Manhole Rings and Lids to Grade	$18,600.00
Woodsong Subdivision, Raise Manhole Rings and Lids to Grade	$7,610.00
Manhole Rehabilitations	$238,360.00
Manhole Inflow Preventer Lid Installations	$48,000.00
US-17 South Force Main Addition	$883,325.00
Arnold Street/White Street Sewer Addition	$610,950.00
Village Road Sewer Addition	$537,750.00

Table 5.2 Estimated Project Costs Table of Potential Sewer Collection System Modifications

Existing Concrete Septic Tank Replacements

The septic tank replacements construction project consists of removal of existing concrete septic tanks that were converted to/currently function as pump tanks and replacement with new fiberglass tanks for about 350 TOS-maintained pump stations. This project was previously included in the TOS CIP but was updated as part of the AIA project with a new estimated construction cost per replacement and total number of replacements. The TOS suspects that many of these tanks are causing inflow and infiltration to the sewer collection system due to their age and current usage, a usage they were not originally intended for. Replacement of all existing concrete septic tanks will require multiple years to complete due to the total number of replacements and the total time to replace at each individual tank.

Brierwood/Downtown Force Main Replacement

The force main replacement construction projects each consist of complete demolition of the existing force main and replacement with new pipe and appurtenances. Based on TOS records the three (3) force mains to be replaced were installed around 1982 and have not undergone any upgrades/retrofits since they were originally installed. These two (2) force main are critical to the TOS's sewer collection system due to the number of customers the mains provide service to. The areas that the force mains service have undergone significant growth since they were first installed, and the proposed construction projects would allow for the construction of new force mains that provide service to the oldest and heavily developed areas of the TOS.

Annual Lift Station Components Replacement

The lift station components replacement project consists of removing major components (rails, seats, pumps, float switches, hardware) and replacing with all new components at one (1) of the TOS's major lift station annually. The TOS began these replacements in 2016 and has continued conducting them over the past few years. The lift stations are critical components of the TOS's sewer collection system and do not have any redundancy. Continuing with the annual replacement project will ensure that the lift stations operate efficiently without any interruptions to service and reduce the likelihood of unplanned emergency repairs.

Rivers Edge Subdivision/Woodsong Subdivision, Raise Manhole Rings and Lids to Grade

This construction project consists of excavating the soil over buried manholes and installing riser sections to bring the elevation of the manhole lid to existing grade. During the sewer asset locates phase of the AIA project it was discovered that a significant number of manholes in the two (2) subdivisions were buried and not at grade. In addition to the increased potential for inflow and infiltration, maintenance on the buried manholes becomes more challenging for the TOS. Raising the manhole rings and lids would assist the TOS is more easily and thoroughly maintaining its system while also reducing the potential for inflow and infiltration.

Manhole Rehabilitations

The manhole rehabilitations project consists of repairing manholes which had cracks and holes that were observed while visually inspecting the manhole during the sewer assets location phase of the project. Repair to these manholes is critical to stop active inflow and infiltration into the sewer collection system. The repairs would consist of sealing and plugging cracks and holes to prevent any additional water from entering the manhole and ensuring no additional cracks form or enlarge.

Manhole Inflow Preventer Lid Installations

The manhole inflow preventer lid installations project consists of reviewing each gravity sewer manhole within the TOS's sewer collection system for the presence of an inflow preventer lid and adding a new lid if a manhole does not currently contain one. The lid creates a barrier between the porous lid/ring portion of a manhole and the manhole invert to prevent inflow. A

lack of inflow preventer lids and damaged lids were noted while conducting the field locates on the TOS's sewer system assets. Extra lids could be stored at the TOS's facilities to be available to Town staff when working with sewer manhole. A directed effort to install the lids on all sewer manholes in the TOS would reduce the potential sources for inflow and infiltration into the Town's system.

US-17 South Force Main Addition

This proposed construction project consists of installing a force main along US-17 South from North Mulberry Road to Highway 130. The purpose of this force main will be to add additional capacity for the lines that run to the WWTF. The proposed force main will also complement the previously completed force main extension from the WWTF to North Mulberry Road. The previously installed force main reduces the bottle neck effect that previously occurred at the beginning of the 8" force main that collects a large portion of the TOS's sewer system and transports it to the WWTF. The force main construction from the WWTF to North Mulberry Road consisted of construction of a 12" PVC line.

Arnold Street/White Street Sewer Addition

This proposed construction project consists of installing additional pressure sewer lines along Arnold Street and White Street to accommodate future growth in that area of Town. That portion of Town is expected to undergo significant growth during the project planning period and the added capacity will help ensure adequate capacity exists to service the area.

Village Road Sewer Addition

This proposed construction project consists of installing an additional pressure sewer line along Village Road to accommodate future growth in that area of Town. The TOS anticipates significant growth in that area and the additional sewer line will add capacity to the system to accommodate future development.

Section 6: Operations and Maintenance Plan

The Town of Shallotte's public works staff have developed and continue to maintain a robust Operations and Maintenance Plan (O&M Plan) that is used daily by the operating staff. The O&M plans are readily accessible to the operating staff and are used a guide for standard operating procedures and for emergency situations. The following sections briefly outline the O&M plans that are used for the day-to-day management of the water distribution system and sewer collection system.

Operations are managed by the Public Works Director at the Shallotte Town Hall.

The Town of Shallotte recognizes that the success of the utility systems depends on having an effective operations and maintenance program that is focused on continuous improvement. By focusing on continuous improvement, the program will be able to adjust to better meet the level of service targets. The objectives for the operations and maintenance program are as follows:

- Maximizing planned maintenance and minimizing unplanned maintenance to be more cost-effective
- Maintaining a frequent inspection program to identify potential failures before they become emergency failures
- Involve field crews in maintenance planning and provide training on "why we do what we do" so that they are prepared for problems that they may encountered while doing their work
- Provide formal training on standard procedures, equipment operation, and health and safety protection
- Complete inspections and maintain records to ensure continued compliance with all federal and state regulations

Maps of Systems & Associated Appurtenances

The Town uses paper copy maps of the existing water distribution system that are stored in the maintenance shop on Russ Street. Additionally, the Town Engineer maintains AutoCAD drawing files, PDF images of current and historic drawings, and makes paper copies available for use at the Town Hall & Public Works Maintenance building for both the water and sewer systems. See the appendices included with this report for system maps.

Inventory of Property

The inventory of spare parts and equipment used for system maintenance is kept in the maintenance shop on Russ St. These records continually updated and made readily available to field crews at any given time.

Location of key spare parts, vendor contact, repair services used

Water distribution and sewer collection system spare parts are kept at the Public Works building and maintenance shop on Russ Street. Vendor contacts and repair services used are managed by the Public Works Director, and Debra Horn, the Utilities & Zoning Administrator.

O&M Technical Manuals for Key Equipment

O&M technical manuals are kept at the Public Works Maintenance building on Russ Street and are kept in organized, easily accessible files.

Emergency Contacts & Location of Records

A list of emergency contacts and all water distribution and sewer collection system records are kept at Town Hall in the Utilities & Zoning Administrator's office.

Emergency Response Plan

The emergency response plan for the water distribution and sewer collection system is kept in the maintenance shop on Russ Street.

Monitoring-Inspection Plan

The Town works closely with BCPU and NCDENR-PWS to maintain an approved monitoring plan. Annual total coliform, total Haloacetic Acids (HAA), and total trihalomethanes (TTHMs) sampling is completed by NCDENR-PWS in accordance with the NC Water Assessment Program (SWAP); while Shallotte is responsible for any additional total coliform testing, total HAA testing, and TTHMs testing. The complete monitoring plan is kept in the Public Works Director's office as a part of the water inspection manual. The Town's maintenance crews use the water inspection manual to guide the completion of routine inspections, valve exercising, and hydrant flushing as a part of its day-to-day operations.

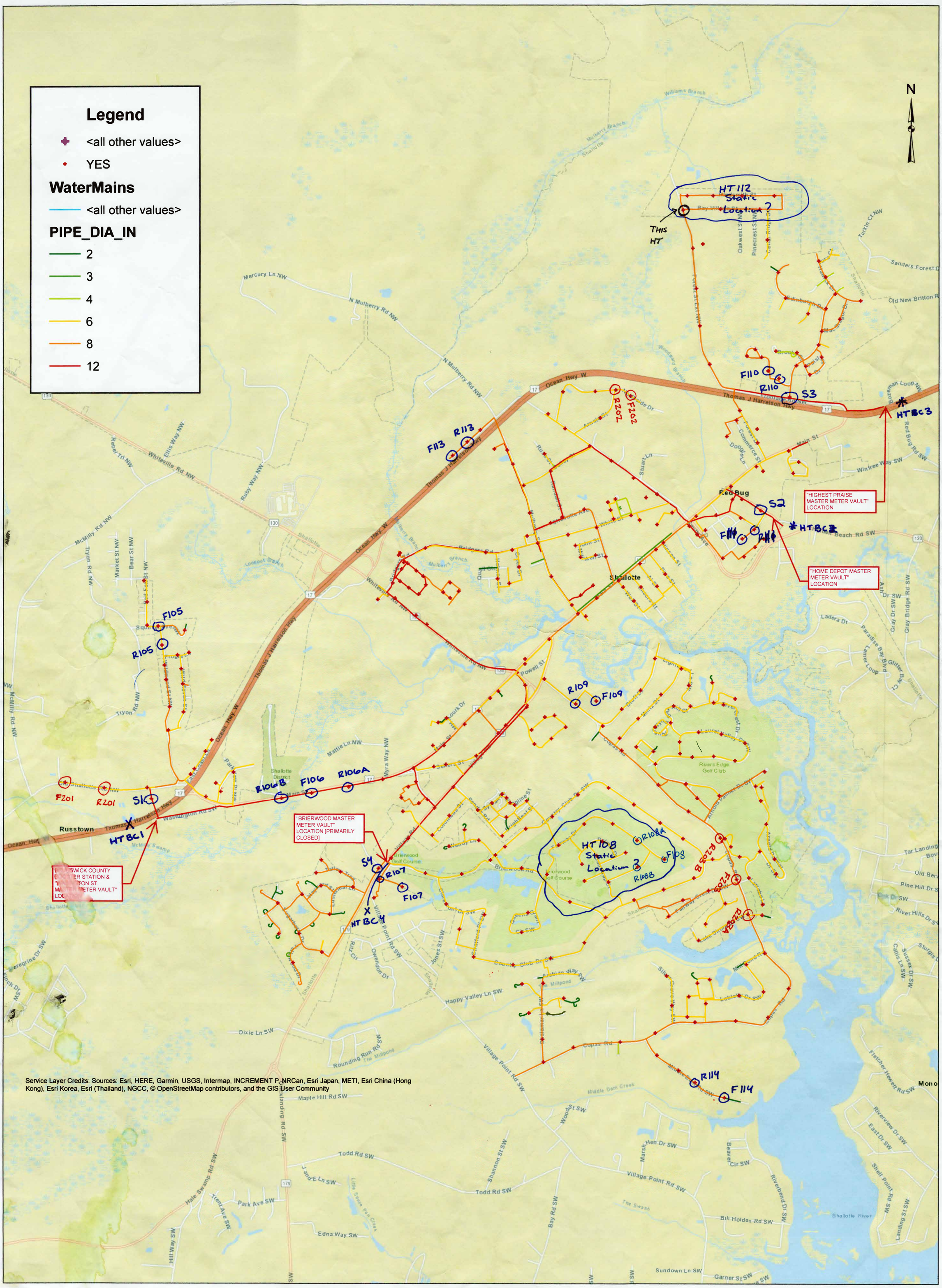
The TOS Public Works Department is responsible for operating and maintaining the Town's sewer collection system. Daily monitoring and repairs of lift stations are responsibilities of the public works department. The department is also responsible for cleaning the system and responding to calls from Town residents about sewer system issues.

References

Bentley Communities. (2019, December 4). *Bentley WaterGEMS V8i Quick Start Lessons.* Retrieved from U.S. EPA Water Infrastuture Outreach: https://www3.epa.gov/region1/sso/pdfs/condition-assessment-underground-pipes.pdf

United States Environmental Protection Agency. (2019, December 4). *Condition Assessment of Underground Pipes.* Retrieved from U.S. EPA Water Infrastuture Outreach: https://www3.epa.gov/region1/sso/pdfs/condition-assessment-underground-pipes.pdf

United States Environmental Protection Agency. (2019, December 4). *Fact Sheet: Asset Managment for Collection Systems.* Retrieved from EPA: https://www.epa.gov/sites/production/files/2015-10/documents/assetmanagement.pdf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2
3
4
6
8
12
N
HT 112 Static Location 2
THIS HT
F110
R110
S3
HTBC3
"HIGHEST PRAISE MASTER METER VAULT" LOCATION
S2
HTBC2
"HOME DEPOT MASTER METER VAULT" LOCATION
F202
R202
F113
R113
F105
R105
F201
R201
S1
HTBC1
"BRIERWOOD MASTER METER VAULT" LOCATION [PRIMARILY CLOSED]
S4
R107
F107
HTBC4
R106B
F106
R106A
R109
F109
HT 108 Static Location 3
R108A
F108
R108B
R114
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Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

APPENDIX F | Water: Capital Improvements Plan Projects

Main Street Transmission Main Addition					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 47,000.00	$ 47,000.00
2	12-Inch DIP Waterline	11,300	LF	$ 120.00	$ 1,356,000.00
3	12-Inch Gate Valve	6	EA	$ 3,000.00	$ 18,000.00
4	Erosion Control	11,300	LF	$ 10.00	$ 113,000.00
5	12-Inch Tapping Sleeve & Valve	12	EA	$ 7,500.00	$ 90,000.00
Construction Subtotal					**$ 1,624,000.00**
Construction Contingency					$ 162,400.00
Preliminary Engineering					$ 30,000.00
Engineering Design & Bidding					$ 121,800.00
Construction Administration					$ 105,600.00
Legal & Administrative					$ 25,000.00
Total Opinion of Probable Cost					**$ 2,068,800.00**

Elevated Water Tank Addition					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 51,000.00	$ 51,000.00
2	12-Inch DIP Waterline	500	LF	$ 80.00	$ 40,000.00
3	12-Inch Gate Valve	4	EA	$ 2,000.00	$ 8,000.00
4	12-Inch Tapping Sleeve & Valve	2	EA	$ 7,500.00	$ 15,000.00
5	Supply Control Valve	2	LS	$ 75,000.00	$ 150,000.00
6	500,000 Gallon Elevated Water Tank Assembly	1	LS	$ 1,500,000.00	$ 1,500,000.00
Construction Subtotal					**$ 1,764,000.00**
Construction Contingency					$ 176,400.00
Preliminary Engineering					$ 30,000.00
Engineering Design & Bidding					$ 123,500.00
Construction Administration					$ 105,800.00
Legal & Administrative					$ 10,000.00
Total Opinion of Probable Cost					**$ 2,209,700.00**

Frontage Road/US-17 South Transmission Main Addition					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$30,000.00	$ 30,000.00
2	Pressure Testing & Chlorination	1	LS	$ 5,000.00	$ 5,000.00
3	12-Inch C900 DR 18 PVC Waterline	7,060	LF	$ 125.00	$ 882,500.00
4	6-Inch C900 DR 18 PVC Waterline	755	LF	$ 50.00	$ 37,750.00
5	12-Inch 90° Bend	1	EA	$ 275.00	$ 275.00
6	12-Inch 22.5° Bend	2	EA	$ 275.00	$ 550.00
7	Remove 6" plug & tie into existing 6" watermain	1	EA	$ 4,000.00	$ 4,000.00
8	Erosion Control	7,815	LF	$ 10.00	$ 78,150.00
9	Remove 12" plug & tie into existing 12" watermain	1	EA	$ 5,000.00	$ 5,000.00
Construction Subtotal					**$ 1,043,225.00**
Construction Contingency					$ 104,300.00
Preliminary Engineering					$ 40,000.00
Engineering Design & Bidding					$ 83,500.00
Construction Administration					$ 73,000.00
Legal & Administrative					$ 25,000.00
Total Opinion of Probable Cost					**$ 1,369,025.00**

Highlands Watermain Loop

Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 2,000.00	$ 2,000.00
2	6-Inch C900 DR 18 PVC Waterline	530	LF	$ 80.00	$ 42,400.00
3	6-Inch 90° Bend	1	EA	$ 200.00	$ 200.00
4	6-Inch X 8-Inch Tapping Sleeve & Valve	1	EA	$ 2,650.00	$ 2,650.00
5	Long-side Residential Water Service Connection with Meter	3	EA	$ 3,500.00	$ 10,500.00
6	Erosion Control	530	LF	$ 20.00	$ 10,600.00
7	Short-side Residential Water Service Connection with Meter	3	EA	$ 2,800.00	$ 8,400.00
Construction Subtotal					**$ 76,750.00**
Construction Contingency					$ 7,700.00
Preliminary Engineering					$ 10,000.00
Engineering Design & Bidding					$ 6,100.00
Construction Administration					$ 5,400.00
Legal & Administrative					$ 15,000.00
Total Opinion of Probable Cost					**$ 120,950.00**

Birch Pond to US 17 Watermain Extension

Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 10,000.00	$ 10,000.00
2	12-Inch C900 DR 18 PVC Waterline	1,425	LF	$ 85.00	$ 121,125.00
3	20-Inch Diameter Steel Encasement Pipe Installed by Bore & Jack Including 12-Inch RJ Carrier Pipe	250	LF	$ 750.00	$ 187,500.00
4	12-Inch 90° Bend	1	EA	$ 275.00	$ 275.00
5	Erosion Control	1,425	LF	$ 20.00	$ 28,500.00
6	12-Inch Tapping Sleeve & Valve	1	EA	$ 7,500.00	$ 7,500.00
Construction Subtotal					**$ 354,900.00**
Construction Contingency					$ 35,500.00
Preliminary Engineering					$ 15,000.00
Engineering Design & Bidding					$ 28,400.00
Construction Administration					$ 24,800.00
Legal & Administrative					$ 15,000.00
Total Opinion of Probable Cost					**$ 473,600.00**

White Street Transmission Main

Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 17,000.00	$ 17,000.00
2	12-Inch C900 DR 18 PVC Waterline	5,265	LF	$ 85.00	$ 447,525.00
3	12-Inch X 12-Inch Tee	1	EA	$ 400.00	$ 400.00
4	12-Inch Gate Valve	3	EA	$ 3,000.00	$ 9,000.00
5	12-Inch Tapping Sleeve & Valve	2	EA	$ 7,500.00	$ 15,000.00
6	Remove 12" plug & tie into existing 12" watermain	1	EA	$ 5,000.00	$ 5,000.00
7	Erosion Control	5,265	LF	$ 20.00	$ 105,300.00
Construction Subtotal					**$ 599,225.00**
Construction Contingency					$ 59,900.00
Preliminary Engineering					$ 15,000.00
Engineering Design & Bidding					$ 47,900.00
Construction Administration					$ 41,900.00
Legal & Administrative					$ 20,000.00
Total Opinion of Probable Cost					**$ 783,925.00**

APPENDIX G | Sewer: Capital Improvements Plan Projects

Existing Concrete Septic Tank Replacement					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Demolish Existing Concrete Wet Well	1	LS	$ 3,000.00	$ 3,000.00
2	Install New Residential Simplex Grinder Pump Station	1	LS	$ 4,000.00	$ 4,000.00
3	Backfill, Seeding, Fertilizing, Mulching	1	LS	$ 1,000.00	$ 1,000.00
4	Landscaping	1	LS	$ 1,000.00	$ 1,000.00
Construction Subtotal					**$ 9,000.00**
Construction Contingency					$ 900.00
Total Opinion of Probable Cost					**$ 9,900.00**

Brierwood Force Main Replacement					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 41,000.00	$ 41,000.00
2	6-Inch C900 DR 18 PVC Sewer Line (Fittings Incidental)	7,100	LF	$ 80.00	$ 568,000.00
3	6-Inch Gate Valve	2	EA	$ 3,000.00	$ 6,000.00
4	Pavement Repairs	7,100	LF	$ 110.00	$ 781,000.00
5	Erosion Control	7,100	LF	$ 2.50	$ 17,750.00
Construction Subtotal					**$ 1,413,750.00**
Construction Contingency					$ 141,400.00
Engineering Design & Bidding					$ 113,100.00
Construction Administration					$ 99,000.00
Legal & Administrative					$ 20,000.00
Total Opinion of Probable Cost					**$ 1,787,250.00**

Downtown Force Main Replacement					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 15,000.00	$ 15,000.00
2	4-Inch C900 DR 18 PVC Sewer Line (Fittings Incidental)	2,500	LF	$ 75.00	$ 187,500.00
3	4-Inch Valve	1	EA	$ 1,000.00	$ 1,000.00
4	Pavement Repairs	2,500	LF	$ 125.00	$ 312,500.00
5	Erosion Control	2,500	LF	$ 2.50	$ 6,250.00
Construction Subtotal					**$ 522,250.00**
Construction Contingency					$ 78,300.00
Engineering Design & Bidding					$ 41,800.00
Construction Administration					$ 36,600.00
Legal & Administrative					$ 20,000.00
Total Opinion of Probable Cost					**$ 698,950.00**

Annual Lift Station Components Replacement					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 2,000.00	$ 2,000.00
2	Remove and Dispose of Existing Lift Station Components	1	LS	$ 5,000.00	$ 5,000.00
3	Install New Lift Station Components	1	LS	$ 47,000.00	$ 47,000.00
Construction Subtotal					**$ 54,000.00**
Construction Contingency					$ 5,400.00
Engineering Design & Bidding					$ 800.00
Construction Administration					$ 3,800.00
Total Opinion of Probable Cost					**$ 64,000.00**

Rivers Edge Subdivision, Raise Manhole Rings and Lids to Grade					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Excavate Fill Over Manhole Lid & Remove Manhole Lid and Ring	1	LS	$ 4,000.00	$ 4,000.00
2	6" Concrete Riser Ring	30	EA	$ 100.00	$ 3,000.00
3	4" Concrete Riser Ring	30	EA	$ 80.00	$ 2,400.00
4	2" Concrete Riser Ring	30	EA	$ 50.00	$ 1,500.00
5	Grout and Plaster Joints	1	LS	$ 4,000.00	$ 4,000.00
6	Seeding and Fertilizing	1	LS	$ 2,000.00	$ 2,000.00
Construction Subtotal					**$ 16,900.00**
Construction Contingency					$ 1,700.00
Total Opinion of Probable Cost					**$ 18,600.00**

Woodsong Subdivision, Raise Manhole Rings and Lids to Grade					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Excavate Fill Over Manhole Lid & Remove Manhole Lid and Ring	1	LS	$ 1,000.00	$ 1,000.00
2	6" Concrete Riser Ring	17	EA	$ 100.00	$ 1,700.00
3	4" Concrete Riser Ring	17	EA	$ 80.00	$ 1,360.00
4	2" Concrete Riser Ring	17	EA	$ 50.00	$ 850.00
5	Grout and Plaster Joints	1	LS	$ 1,000.00	$ 1,000.00
6	Seeding and Fertilizing	1	LS	$ 1,000.00	$ 1,000.00
Construction Subtotal					**$ 6,910.00**
Construction Contingency					$ 700.00
Total Opinion of Probable Cost					**$ 7,610.00**

Manhole Rehabilitations					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 5,900.00	$ 6,000.00
2	Rehabilitate Manhole with Plugs & Liners, Includes Pump Around Set-up	49	EA	$ 4,000.00	$ 196,000.00
Construction Subtotal					**$ 202,000.00**
Construction Contingency					$ 20,200.00
Engineering Design & Bidding					$ 2,020.00
Construction Administration					$ 14,140.00
Total Opinion of Probable Cost					**$ 238,360.00**

Manhole Inflow Preventer Lid Installations					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Inflow Preventer Lid	400	EA	$ 120.00	$ 48,000.00
Total Opinion of Probable Cost					**$ 48,000.00**

US-17 South Force Main Addition					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 20,000.00	$ 20,000.00
2	12-Inch C900 DR 18 PVC Sewer Line (Fittings Incidental)	5,450	LF	$ 120.00	$ 654,000.00
3	12-Inch Gate Valve	1	EA	$ 3,000.00	$ 3,000.00
4	Erosion Control	5,450	LF	$ 2.50	$ 13,625.00
Construction Subtotal					**$ 690,625.00**
Construction Contingency					$ 69,100.00
Engineering Design & Bidding					$ 55,300.00
Construction Administration					$ 48,300.00
Legal & Administrative					$ 20,000.00
Total Opinion of Probable Cost					**$ 883,325.00**

Arnold Street/White Street Sewer Addition					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 14,000.00	$ 14,000.00
2	4-Inch C900 DR 18 PVC Sewer Line (Fittings Incidental)	4,600	LF	$ 75.00	$ 345,000.00
3	4-Inch Gate Valve	2	EA	$ 2,000.00	$ 4,000.00
4	6-Inch C900 DR 18 PVC Sewer Line (Fittings Incidental)	1050	LF	$ 80.00	$ 84,000.00
5	6-Inch Gate Valve	2	EA	$ 3,000.00	$ 6,000.00
6	Pavement Repairs	75	LF	$ 110.00	$ 8,250.00
7	Erosion Control	4,600	LF	$ 2.50	$ 11,500.00
Construction Subtotal					**$ 472,750.00**
Construction Contingency					$ 47,300.00
Engineering Design & Bidding					$ 37,800.00
Construction Administration					$ 33,100.00
Legal & Administrative					$ 20,000.00
Total Opinion of Probable Cost					**$ 610,950.00**

Village Road Sewer Addition					
Item No.	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization	1	LS	$ 12,000.00	$ 12,000.00
2	4-Inch C900 DR 18 PVC Sewer Line (Fittings Incidental)	4,900	LF	$ 75.00	$ 367,500.00
3	4-Inch Gate Valve	2	EA	$ 3,000.00	$ 6,000.00
4	Pavement Repairs	150	LF	$ 110.00	$ 16,500.00
5	Erosion Control	4,900	LF	$ 2.50	$ 12,250.00
Construction Subtotal					**$ 414,250.00**
Construction Contingency					$ 41,400.00
Engineering Design & Bidding					$ 33,100.00
Construction Administration					$ 29,000.00
Legal & Administrative					$ 20,000.00
Total Opinion of Probable Cost					**$ 537,750.00**

Attachment – 3

Town of Shallotte/Brunswick County Memorandum of Understanding

Town of Shallotte

ACTION AGENDA ITEM

2022

TO: Board of Alderman

FROM: Mimi Gaither
EXT. #

ACTION ITEM #: _____
MEETING DATE: _____
DATE SUBMITTED: _____

ISSUE/ACTION REQUESTED: Approve MOU with County regarding water transfer.

PUBLIC HEARING: ☐ YES ☒ NO

BACKGROUND/PURPOSE OF REQUEST: County Approved the MOU at their last meeting.

FISCAL IMPACT:

BUDGET AMENDMENT REQUIRED:	☐ YES	☒ NO
CAPITAL PROJECT ORDINANCE REQUIRED:	☐ YES	☒ NO
PRE-AUDIT CERTIFICATION REQUIRED:	☐ YES	☒ NO
REVIEWED BY DIRECTOR OF FISCAL OPERATIONS	☐ YES	☒ NO

CONTRACTS/AGREEMENTS:

REVIEWED BY TOWN ATTORNEY:	☐ YES	☒ NO	☐ N/A

ADVISORY BOARD RECOMMENDATION: N/A

TOWN ADMINISTRATOR'S RECOMMENDATION: Approval - MOG

FINANCE RECOMMENDATION: N/A

ATTACHMENTS:

1.
2.
3.

ACTION OF THE BOARD OF ALDERMEN

APPROVED: ☑
DENIED: ☐

ATTEST: **CLERK TO THE BOARD**

DEFERRED UNTIL: _____

Sandy Strickland
SIGNATURE

OTHER:

TOWN OF SHALLOTTE CORPORATE SEAL 1899 NORTH CAROLINA

BRUNSWICK COUNTY ADMINISTRATION

BRUNSWICK COUNTY GOVERNMENT CENTER
DAVID R. SANDIFER COUNTY ADMINISTRATION BUILDING
30 GOVERNMENT CENTER DRIVE, N.E., BOLIVIA, NC 28422

[redacted]

Mar 31 2022
10:54A

MAILING ADDRESS

P.O. BOX 249
BOLIVIA, NORTH CAROLINA 28422

TELEPHONE
(910) 253-2000
(800) 442-7033

FAX
(910) 253-2022

March 23, 2022

Mimi Gaither,

Enclosed please find the Shallotte Water Utility Consolidation Study MOU.

Once it is executed, please return a signed copy to us.

Thank you and have a great day.

Raquel Perez
Executive Assistant
Brunswick County Administration

MEMORANDUM OF AGREEMENT BETWEEN THE COUNTY OF BRUNSWICK AND THE TOWN OF SHALLOTTE RE CONSOLIDATION OF WATER SYSTEMS

1. PARTIES. The Parties to this Memorandum of Understanding are the County of Brunswick (the County) and the Town of Shallotte (the Town).

2. PURPOSE. The purpose of this Memorandum of Understanding between the County and the Town is to express the mutual desire of the Parties to merge the water distribution system of the Town into the water system of the County by transferring the Town's water system to the County. The County is now, and has been, the wholesale supplier of finished water to the Town for distribution to customers inside the Town limits for decades. The parties believe that there exist mutual benefits to the Town, the County, and the customers of the Town's water system to merge the Town's water system into the County's water system. The Parties also desire to agree to certain actions to be taken by the Parties during the period of time in which a merger of the systems is being studied, negotiated and implemented.

3. EXPECTED TIMEFRAME FOR STUDY AND NEGOTIATIONS. Based on the timing of grant cycles and the need for study and negotiation before a final Agreement is reached, the Parties anticipate that the period of time for study and negotiation is likely to be up to one (1) year from the date of execution of this Memorandum of Understanding.

4. WATER SYSTEM ONLY. The Parties acknowledge that the Town operates both a water distribution system and a sewage collection system. The Town desires to retain the sewer system and the County acknowledges that desire and agrees that the Town's water system is the only utility being considered for consolidation.

5. COOPERATION IN GRANT APPLICATIONS. The Town and the County have cooperated in submitting an application to the NC Department of Environmental Quality, Water Resources Division, for a grant under the Merger/Consolidation Feasibility Grant Program to study the challenges, opportunities, and issues involved with a merger of the Town's water distribution system into the County's water system. Feasibility Grant awards are expected in the first quarter of 2022, and implementation grants are expected later in the year. Following a study of the issues it is expected that the Parties will take certain actions to address the issues identified in the study and proceed to negotiate the transfer of the Town's system to the County. The Parties agree that they will cooperate with one another in applying for additional grant funding to cover any expenses that may be determined to be necessary to implement the transfer. For example, but not intended as a limitation, the Parties may apply for grant funding to upgrade or repair elements of the Town's system and to change out the Town water meters to be compatible with the water meters and billing software of the County's system.

6. RATE GUARANTEE. The Town has declared that a principal reason for entering into the water system merger negotiations with the County is to obtain the same rate for the water customers inside the corporate limits of the Town as is enjoyed by other retail customers of the County water system. The County agrees that in any final Agreement to merge the Town's water system into the County system the County will guarantee that retail water customers in Shallotte will be charged the same retail water rate as all other similarly situated retail customers of the County water system.

7. ALLOWED USE OF THE TOWN WATER RESERVE FUND. The Parties acknowledge that the Town currently holds approximately One Million Two Hundred Thousand Dollars ($1,200,000) in the Town's Water Distribution System Fund (the Reserve Fund). When the County wholesale water rates increased in January, 2022 the retail water rates for customers of the Shallotte water system rose to cover the pass through increase, and such Town retail rates will be higher than County retail rates for similarly situated County customers. The Parties acknowledge that the Town desires to reduce the financial burden of increased water rates on Town water system customers during the period that the Town and County study and negotiate the system merger. To effectuate the goal of providing relief to Town water customers from the increased rates the Parties agree that the Town may use the funds in the Reserve Fund to subsidize the retail water rates charged to water customers of the Town's water system from and after the effective date of the County wholesale water rate increase. It is the Town's intention to subsidize the rates such that the rate charged by the Town to customers of the Shallotte Water System will mirror the rate that would be charged to a similarly situated County retail customer. The Parties acknowledge that the use of the funds in this manner will deplete the Reserve Fund, although the projection is that less than half of the Reserve Fund would actually be used based on estimated costs to subsidize rates and the expected timeframe for study, negotiation and implementation of the merger of the Town Water System into the County Water System. As a safeguard, the County and the Town agree that if the Reserve Fund is reduced by fifty percent (50%) of the value it held as of the date of execution of this MOU, the Town will cease subsidizing the rates of Shallotte customers unless there is a reasonable certainty that the merger will be consummated and that the merger will occur before the Reserve Fund is depleted to thirty percent (30%) of the value it held as of the date of execution of this MOU. Under no circumstances will the Reserve Fund be depleted below thirty percent (30%) of the value it held as of the date of execution of this MOU. Further, if for any reason the Town and the County determine that a merger of the water systems will not occur, the Town will immediately stop subsidizing retail rates of Town water customers. The Parties agree that any funds remaining in the Reserve Fund at the point in time of merger of the water systems those funds shall be transferred to the County along with other agreed assets of the Town water system. Except for any remaining balance of funds in the Reserve Fund, the Parties agree that no other cash payment will be required from the Town to the County as a condition of the transfer of the Town's water distribution system to the County.

8. COST SHARING OF CONSOLIDATION STUDY EXPENSES. The Parties acknowledge that there will be expenses incurred in the study of consolidation of the Town's water system into the County water system. By way of example, but not intended as a limitation, there may be engineering studies, legal analysis of easement and right of way documents, and other consultants necessary to effectuate a successful and effective merger. The Parties agree to share equally between them all expenses reasonably necessary to study and negotiate the merger of the water systems, provided however, that each party shall bear their legal expenses separately.

9. SEWER SYSTEM BILLING. The Parties acknowledge that the Town will continue to provide sewage collection service in the Town after the transfer of the water system to the County. The Parties also acknowledge that the billing methodology for sewer rates is based on the volume of water metered to each customer and that the Town will need assistance from the County to maintain an accurate billing system for the Town sewer system. The Parties agree to negotiate in good faith to achieve a reasonable solution for the sewer billing system upon transfer of the water system to the County. By way of illustration, but not intended as a limitation, a

solution could be the transfer of water usage data from the County to the Town, or a contractual agreement for the County to bill the sewer charges on behalf of the Town as part of the County water bill.

10. TRANSFER OF EMPLOYEES. The Parties acknowledge that the Town currently has eight and one half (8 ½) positions budgeted in the Water Department. The Town believes that one or more of the employees in these positions will still be necessary to assist in operation of the Town Sewer system or in other Town departments, but that not all of the employees currently employed in the Water Department will be retained by the Town. The Parties agree to negotiate in good faith on the possible transfer to the County Water Department of current Town Water Department employees who are not retained by the Town.

AGREED TO AND EXECUTED THIS THE 5TH DAY OF APRIL, 2022.

County of Brunswick

By: Randy Thompson

Randy Thompson, Chairman, Board of County Commissioners

ATTEST:

Daralyn Spivey

Daralyn Spivey, Clerk to the Board

BRUNSWICK COUNTY NORTH CAROLINA

Town of Shallotte

By: Walt Eccard

Walt Eccard, Mayor

ATTEST:

Sandy Strickland

Sandy Strickland, Town Clerk

TOWN OF SHALLOTTE CORPORATE SEAL 1899 NORTH CAROLINA

Attachment – 4

Merger, Regionalization, and Feasibility Study Info

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
SHADI ESKAF
Director

NORTH CAROLINA
Environmental Quality

March 17, 2022

Ms. Mimi Gaither, Town Manager
Town of Shallotte
PO Box 2287
Shallotte, NC 28470

SUBJECT: Merger and Regionalization Feasibility
Letter of Intent to Fund
TOS/Brunswick Co. Regionalization
September 2021 Application Cycle
Project No. MRF-D-0055

Dear Ms. Gaither:

The Division of Water Infrastructure (DWI) has reviewed your application to the Merger and Regionalization Feasibility (MRF) grant program, and the State Water Infrastructure Authority (SWIA) has approved your project as eligible to receive a grant. The total grant amount will be $50,000. A grant fee of 1.5% will be invoiced with the grant offer.

The first milestone for the MRF grant is the submittal of a preliminary project scope that includes a cost estimate and schedule for each major task by May 2, 2022. Please email this to your DWI project manager, Matthew Rushing, EI, at matthew.rushing@ncdenr.gov. Upon the Division's review and acceptance of this information, we will send the grant agreement and information package for your signature and approval.

Please contact us if you plan to proceed with study work prior to receipt of the Division's grant offer, as such work may later be determined to be ineligible. Additionally, ensure you review past work completed or underway to develop the current scope of work needed.

We look forward to working with you on this project. If you have questions, please email Matthew Rushing, EI, at matthew.rushing@ncdenr.gov.

Sincerely,

Shadi Eskaf, Director
Division of Water Infrastructure

EC: mgaither@townofshallotte.org
Mark.hubbard@ncdenr.gov
SRP-MRF File

Attachment – 5

Distressed Designation Resolution

RESOLUTION 22-07 BY TOWN OF SHALLOTTE

WHEREAS, Session Law 2020-79 was signed into law on July 1, 2020 to improve viability of the water and wastewater systems of certain units of local government; the Viable Utility Reserve was established in the Water Infrastructure fund to be used for grants to include the study of rates, asset inventory and assessment and/or merger and regionalization options; the State Water Infrastructure Authority and the Local Government Commission have developed criteria to assess local government units and identify distressed units, and

WHEREAS, The Town of Shallotte has embarked on the process outlined by SWIA and the LGC for consideration in becoming designated as a non-viable distressed unit based on financial, managerial, and technical challenges faced by the Town which affect the long-term sustainability of the water utility, and

WHEREAS, The Town of Shallotte has identified Brunswick County, its current water provider, as a willing and able partner for a future consolidation, and

WHEREAS, The Town of Shallotte intends to conduct construction projects that have been identified as critical for the future water system consolidation and has need for state grant assistance to carry out the priority projects, and

WHEREAS, The Town of Shallotte has already completed substantial planning efforts financially supported by the Division of Water Infrastructure, including Asset Inventory and Assessment for the water system, and Merger and Regionalization Feasibility Study was recently awarded for the water system.

NOW THEREFORE BE IT RESOLVED, BY THE TOWN COUNCIL OF THE TOWN OF SHALLOTTE:

That the Town of Shallotte, if designated as distressed, will complete the viable utility requirements in §159G-45(b) by:

1. Conducting an asset assessment and rate study. (completed)
2. Participate in a training and educational program. (Town applied for training funding within a construction application Spring 2022)
3. Develop a short-term and long-term action plan considering all of the following:
    a. Infrastructure repair, maintenance, and management.
    b. Continuing education of the governing board and system operating staff.
    c. Long-term financial management plan.

That the Town of Shallotte acknowledges that the State Water Infrastructure Authority and Local Government Commission can impose specific conditions on grants from the Viable Utility Reserve.

That the Town will provide adequate access to staff, documents, equipment, and other resources pertinent to complete any future VUR projects, and upon completion of the project provide good faith effort to implement the short-term and long-term plan to achieve viable utility infrastructure measures.

That Walt Eccard, Mayor, and Maria Gaither, Town Manager, the Authorized Officials, and successors so titled, are hereby authorized to execute and file these materials for consideration on behalf of the Town with the State of North Carolina for a distressed designation to aid in the completion of the projects to make system consolidations possible.

That the Authorized Officials, and successors so titled, are hereby authorized and directed to furnish such information as the appropriate State agency may request in connection with such process: to make the assurances as contained above; and to execute such other documents as may be required in connection with this process.

That the Town has substantially complied or will substantially comply with all Federal, State, and local laws, rules, regulations, and ordinances applicable to the designation and to future Federal and State grants pertaining thereto.

Adopted this the 8th of June, 2022 at Shallotte North Carolina.

Walter Eccard
(Signature of Chief Executive Officer)

MAYOR
(Title)

CERTIFICATION BY RECORDING OFFICER

The undersigned duly qualified and acting (title of officer) of the (unit of government) does hereby certify: That the above/attached resolution is a true and correct copy of the resolution authorizing the filing of request for a distressed designation with the State of North Carolina, as regularly adopted at a legally convened meeting of the (name of governing body of applicant) duly held on the--- 8th day of June 2022 · and, further, that such resolution has been fully recorded in the journal of proceedings and records in my office. IN WITNESS WHEREOF, I have hereunto set my hand this --- 8th day of June 2022.

Natalie Davis
(Signature of Recording Officer)

TOWN OF SHALLOTTE CORPORATE SEAL 1899 NORTH CAROLINA

Town Clerk
(Title of Recording Officer)

Attachment-6

Comparison and Dashboard Charts

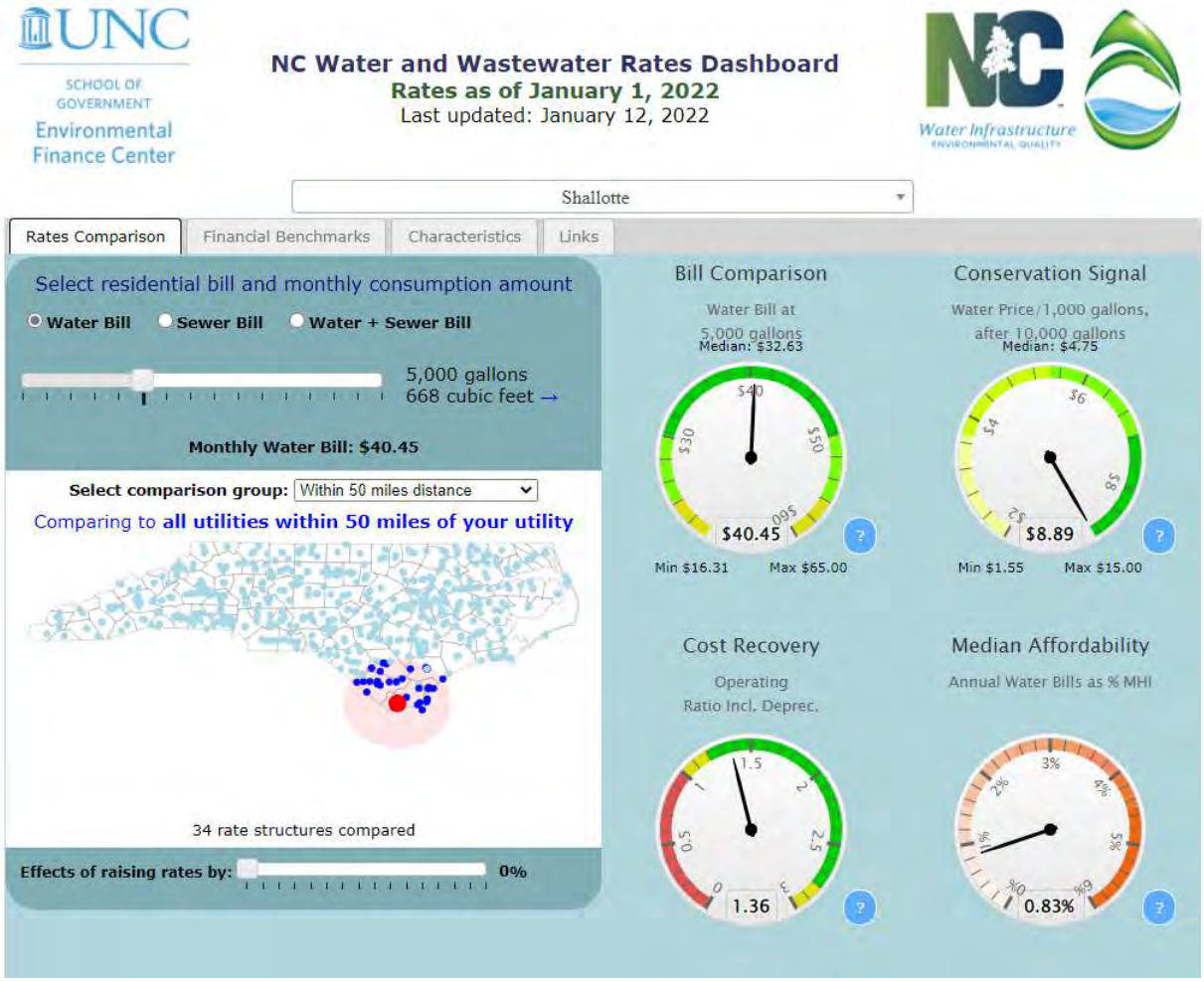
Bi-Monthly Billing - no increase in $4.00 base

Usage	Town Rate Prior to County Increase 1.1.22	Proposed Town Rate 1.1.22 County Increase Only	Proposed Cost of Water with Increases and First Year AIA Recommendation - 30%	Proposed Town Rate with County Increase and Second Year AIA Increase - 30%	Proposed Cost with increases and Third Year AIA Increase - 20%	Proposed Cost with increases and Fourth Year AIA Increase - 15%	% Increase from original	Yearly Cost of Water after Year 4 increases
3,000	$ 35.98	$ 50.14	$ 64.00	$ 82.00	$ 97.60	$ 111.64	210.28%	$ 669.84
5,000.00	$ 35.98	$ 50.14	$ 64.00	$ 82.00	$ 97.60	$ 111.64	210.28%	$ 669.84
6,000.00	$ 35.98	$ 50.14	$ 64.00	$ 82.00	$ 97.60	$ 111.64	210.28%	$ 669.84
10,000.00	$ 57.30	$ 80.90	$ 104.00	$ 134.00	$ 160.00	$ 183.40	220.07%	$ 1,100.40
15,000.00	$ 88.75	$ 124.15	$ 160.25	$ 207.15	$ 247.80	$ 284.40	220.45%	$ 1,706.40
20,000.00	$ 120.20	$ 167.40	$ 216.50	$ 280.30	$ 335.60	$ 385.40	220.63%	$ 2,312.40
35,000.00	$ 219.25	$ 301.85	$ 391.35	$ 507.65	$ 608.50	$ 699.30	218.95%	$ 4,195.80
50,000.00	$ 323.00	$ 441.00	$ 572.30	$ 743.00	$ 891.00	$ 1,024.20	217.09%	$ 6,145.20
100,000.00	$ 679.50	$ 915.50	$ 1,189.30	$ 1,545.50	$ 1,854.00	$ 2,131.70	213.72%	$ 12,790.20
Department Store-Avg 45,024	$ 288.16	$ 394.42	$ 572.30	$ 664.32	$ 796.57	$ 915.61	217.74%	$ 5,493.66
Restaurant-Avg 170,658	$ 1,183.30	$ 1,586.06	$ 2,061.24	$ 2,679.59	$ 3,214.91	$ 3,696.82	212.42%	$ 22,180.92
Restaurant-Avg 263,866	$ 1,847.22	$ 2,470.53	$ 3,211.46	$ 4,175.61	$ 5,010.14	$ 5,761.42	211.90%	$ 34,568.52
Restaurant - Avg 99,553	$ 676.31	$ 911.26	$ 1,183.87	$ 1,538.44	$ 1,845.53	$ 2,121.95	213.75%	$ 12,731.70
Nursing Home-Avg 937,800	$ 6,653.01	$ 8,866.22	$ 11,527.75	$ 14,992.19	$ 17,990.03	$ 20,688.97	210.97%	$ 124,133.82
Car Wash - Avg 923,792	$ 6,553.12	$ 8,790.21	$ 11,356.10	$ 14,767.33	$ 17,720.20	$ 20,378.65	210.98%	$ 122,271.90
Car Wash - Avg 126,075	$ 865.41	$ 1,162.95	$ 1,511.13	$ 1,964.08	$ 2,356.30	$ 2,709.37	213.07%	$ 16,256.22

Prior to the 1.1.22			**After Jan 1, 2022 - w/ Just County Inc**	**W/ County Increase and 30% AIA***	**W/ County Increase and 30% AIA***	**W/ County Increase and 20% AIA***	**W/ County Increase and 15% AIA***
In-Town Water Rates* - Bi Monthly			In-Town Water - Bi Monthly	In-Town Water - Bi Monthly	In-Town Water - Bi Monthly	In-Town Water - Bi Monthly	In-Town Water - Bi Monthly
Admin Fee	$4.00 per billing period		$4.00 per billing period	$4.00 per billing period	$4.00 per billing period	$4.00 per billing period	$4.00 per billing period
0 – 10,000:	$5.33 per 1,000 gallons		$7.69 per 1,000 gallons	$10.00 per 1,000 gallons	$13.00 per 1,000 gallons	$15.60 per 1,000 gallons	$17.94 per 1,000 gallons
10,001 – 20,000:	$6.29 per 1,000 gallons		$8.65 per 1,000 gallons	$11.25 per 1,000 gallons	$14.63 per 1,000 gallons	$17.56 per 1,000 gallons	$20.20 per 1,000 gallons
20,001 – 30,000:	$6.53 per 1,000 gallons		$8.89 per 1,000 gallons	$11.56 per 1,000 gallons	$15.03 per 1,000 gallons	$18.04 per 1,000 gallons	$20.75 per 1,000 gallons
30,001 – 40,000:	$6.75 per 1,000 gallons		$9.11 per 1,000 gallons	$11.85 per 1,000 gallons	$15.41 per 1,000 gallons	$18.50 per 1,000 gallons	$21.28 per 1,000 gallons
40,001 – 50,000:	$7.00 per 1,000 gallons		$9.36 per 1,000 gallons	$12.17 per 1,000 gallons	$15.83 per 1,000 gallons	$19.00 per 1,000 gallons	$21.85 per 1,000 gallons
50,001 +	$7.13 per 1,000 gallons		$9.49 per 1,000 gallons	$12.34 per 1,000 gallons	$16.05 per 1,000 gallons	$19.26 per 1,000 gallons	$22.15 per 1,000 gallons
	(Min Chg - $35.98 (6,000 gal and less)		(Min Chg – 50.14 (6,000 gal and less)	(Min Chg – 64.00 (6,000 gal and less)	(Min Chg – 82.00 (6,000 gal and less)	(Min Chg – 50.14 (6,00 gal and less)	(Min Chg – 97.60 (6,000 gal and less)
Assumes no County increase*							
County Retail Rate January 1, 2022 - Monthly - All Size Meters							
Domestic		$16.00 per billing period*					
Block 1	0-9,999	$4.15		**Town cost of wholesale water 1.1.22**	**5.25**		
Block 2	10,000-39,999	$4.80					
				Town cost of wholesale water prior to 1.1.22	**2.89**		
Block 3	> 40,000	$5.70					
Irrigation		5.00 per billing period					
Block 1	0-9,999	$4.80					
Block 2	10,000-39,999	$6.20					
Block 3	> 40,000	$8.30					
*Monthly rate increases by meter size							
$16.00 per month is 3/4 meter							

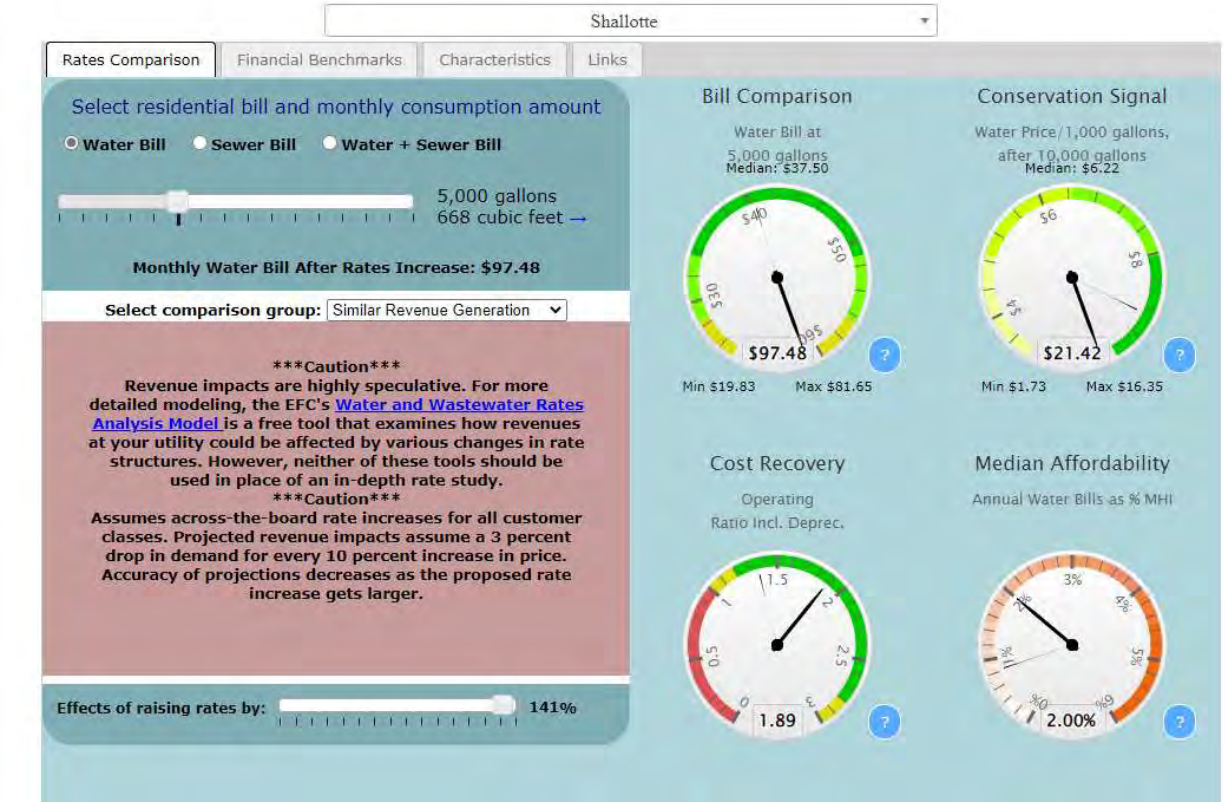
Shallotte Dashboard Comparison Data

The Town of Shallotte's current residential water rate is $50.14 per 5,000 gallons. According to the UNC School of Government Environmental Finance Center Water Sewer Rate Dashboard the average water rate for areas within 50 miles of Shallotte is $40.45. The average rate for systems with similar operating revenues is $40.45. Additionally, the Division of Water Infrastructure give priority points for those systems that have a combined rate of 79.00 and above. In two years, Shallotte's water rate alone will be above $79.00 per 5,000 gallons.



Shallotte's current water rate is well over the average rates shown on the dashboard, additionally as you can see on the provided charts Shallotte's rate will also need to increase 30% each year for the next 2 years and 30% the third year to cover the cost of capital improvements.

When you plug this increase over the next 5 years into the dashboard it shows Shallotte in the max category in terms of rate comparison and will most definitely be unaffordable for the majority of the population in Shallotte, of which approximately 40% is aging.



Attachment-7

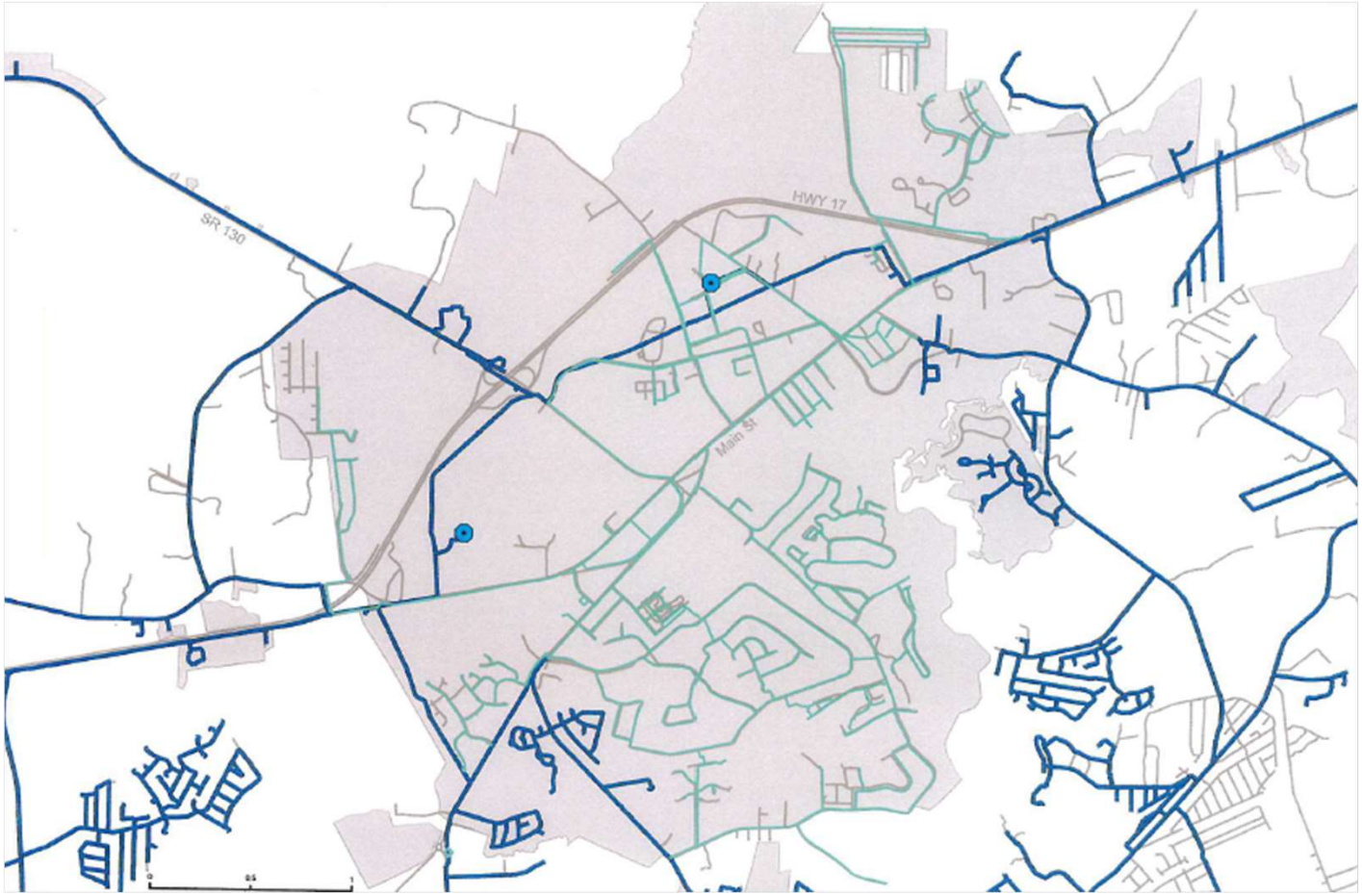
Town Presentation to DWI for Non-Viability (4/4/2022)

Shallotte Consolidation SRF Project

Why System is Non-Viable

Background

- 57 miles of distribution lines
- Interconnects with Brunswick County in 3 boundary point areas
- 1,979 residential connections
- 361 non-residential connections
- 8 employees that work to manage the water system



Brunswick County/ Shallotte Partnership

- Shallotte has purchased water from the county for over 40 years
- Town and County have good relationship
- Two entities have entered into an MOU for merger

Previous Studies: What Led to a Merger?

- Shallotte completed an Asset Management Plan and Rate Study as part of an AIA Grant from DWI
- Rate study indicated rate increases over a 10-year period just to cover the needed capital investments.

Fiscal Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Annual Ave
Water	30%	30%	20%	15%	15%	10%	10%	8%	7%	5%	15.0%
Sewer	8%	6%	5%	5%	5%	5%	5%	5%	5%	5%	5.4%
Water & Sewer	14.8%	12.1%	8.0%	6.4%	6.0%	4.7%	4.6%	4.1%	3.8%	3.4%	6.8%

- The Town has implemented rate increases over past 5 years.
- Shallotte applied for a merger regionalization study (MRF) grant in fall 2021 award was just announced in February 2022.

Previous Studies: What Led to a Merger?

- Brunswick County conducted a rate study that found the need to increase wholesale water rates by 81% to cover operational cost and capital improvements cost, specifically the reverse osmosis plant needed to address emergent contaminants.
- Shallotte decided to implement a rate increase for water to match the County's rate to account for the increase in water cost. (cost increase of $240,000 in 2022 and $500,000 each year after) (old rate 35.98 per 5,000-new rate $52.75 per 5,000 gallons)
- Rate increase and current rate structure doesn't account for capital projects and operation and maintenance of the system.

Bi-Monthly Billing

Usage	Town Approved Rate Using County Model 1.1.22
3,000	$44.45
5,000	$52.75
6,000	$56.90
10,000	$73.50
15,000	$97.50
20,000	$121.50
35,000	$207.00
50,000	$292.50
100,000	$577.50

Why Merge Now?

- Town no longer viable
- Town has $1,200,000 in reserves
- Initial capital projects are 1.4 million to buy allocation in a County Tank or 3.4 to build a new tank. (current rate increase doesn't cover)
- Water customers can't continue to bear the burden as rates will need to increase past the 2022 structure.
- Town worked with Parker Poe to assist and guide them through MOU process and confer with LGC representatives.
- Due to the increased cost of water the Town of Shallotte can no longer continue to operate a viable water system.