

NewGen Strategies & Solutions

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REPORT

FAIR VALUE APPRAISAL OF THE WATER SYSTEM IN CARTERET COUNTY

JULY 7, 2022



Prepared for:
Public Staff - North Carolina Utilities Commission
430 North Salisbury Street
Raleigh, NC 27603-5918

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EXECUTIVE SUMMARY

Presented herein is an appraisal report (Report) for the Fair Value estimate undertaken by NewGen Strategies and Solutions, LLC of the Carteret County Water System. This appraisal has been conducted for The Public Staff – N.C. Utilities Commission. This Report has been prepared in accordance with the Uniform Standards of Professional Appraisal Practice as promulgated by the Appraisal Standards Board of the Appraisal Foundation.

Summary of Value Indicators

	Value Indicators
Cost Approach	
OCLD	\$ 5,750,000
RCNLD *	\$ 13,032,000
Sales Comparison Approach	Not relied upon
Income Approach	
DCF	\$ 7,332,000
Fair Market Value	\$ 7,332,000

* Excludes adjustment for economic obsolescence

Note: Table values may not equal exhibit values due to rounding to the nearest \$1,000

Based on our analyses as discussed herein, NewGen Strategies and Solutions, LLC is of the opinion that the Fair Value estimate of the Carteret County Water system as of January 1, 2022 is approximately \$7,332,000.

We appreciate the opportunity to assist The Public Staff – N.C. Utilities Commission in this engagement. If you have any questions concerning this report, please contact me at mlane@newgenstrategies.net.

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Section 1

PREMISE OF THE APPRAISAL

The Public Staff – N.C. Utilities Commission (Public Staff or Client) retained NewGen Strategies and Solutions, LLC (NewGen) to perform an independent appraisal to determine the Fair Value (FV) of the Water System of Carteret County (the System or Subject Property).

In undertaking the study and analyses required to provide an opinion with respect to the FV of the System, NewGen relied on generally accepted valuation methods and procedures. This appraisal report was prepared in conformance with the 2020-2021 Edition of the Uniform Standards of Professional Appraisal Practice (USPAP) as promulgated by the Appraisal Standards Board of the Appraisal Foundation (extended through December 31, 2022).

Date of Valuation

The FV of the Subject Properties was estimated as of January 1, 2022.

Date of Appraisal Report

The date of this appraisal report is July 7, 2022.

Purpose and Intended Use of Appraisal

The purpose of the appraisal is to determine the FV of the System in accordance with the applicable laws, statutes and USPAP. The appraisal is intended to be used by the Public Staff in its decision-making processes related to the FV of the System in accordance with §62-133.1A of the North Carolina General Statutes and Rule R7-41 of the North Carolina Public Utilities Rules.

Definition of Fair Value

The definition of FV used in this appraisal report is as follows:

The price at which property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts.¹

Property Interests Appraised

This appraisal evaluates the properties with no restrictions, indebtedness, or other encumbrances. A description of the System can be found in Section 3 of this report.

¹ Fair Value as defined in Treasury Regulation §1.170A-1(c)(2)

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Highest and Best Use

Highest and best use is defined as, "the most reasonably probable and legal use of a property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value."² In our opinion, the highest and best use of the System is its current use, to provide water service.

Scope of Services

At the request of the Client, NewGen performed an independent appraisal to determine the FV of the System as of January 1, 2022. In undertaking the studies and analyses required to provide an opinion with respect to the FV of the System, NewGen has relied on generally accepted valuation methods and procedures in accordance with USPAP. In performing the appraisal, NewGen considered all three generally accepted approaches to valuation (i.e., cost, income, and sales comparison) and their degree of applicability in estimating the value of the System in accordance with §62-133.1A of the North Carolina General Statutes. The results of NewGen's analyses and indicators of value developed are described in Section 4 of this appraisal report.

As part of the services provided, NewGen performed an on-site field review of the System in connection with the appraisal.

Research Undertaken

NewGen's opinions, set forth herein, are based on information provided by the Client, the engineering report for the System prepared by Draper Aden Associates (provided in Exhibit 3), other information generally available to NewGen, and studies and analyses undertaken by NewGen, all of which are basic to and in support of NewGen's opinion regarding the FV of the System. The studies and analyses undertaken in preparation of the opinions contained herein have been performed in accordance with USPAP as promulgated by the Appraisal Standards Board of the Appraisal Foundation. These studies and analyses included a site visit to the System and investigations and review of certain documents relating to the System.

NewGen Strategies and Solutions

NewGen Strategies and Solutions, LLC is a management and economic consulting firm specializing in serving the utility industry and market. We provide financial, valuation, strategy, expert witness, stakeholder and sustainability consulting services to water, wastewater, solid waste, and energy clients across the country. Our expertise includes litigation support in state and federal regulatory proceedings, valuation of utility property, business and financial planning, and strategic planning.

NewGen has provided appraisal reports for a wide range of sizes and types of utility property. Based on this experience, the NewGen team is well qualified to appraise utility property and prepare appraisal reports. Specifically, the appraisers and other personnel working on this assignment have the knowledge and experience to complete the assignment competently.

² American Society of Appraisers, *Valuing Machinery and Equipment*, page 570.

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ASSUMPTIONS, CONSIDERATIONS AND LIMITING CONDITIONS

In the preparation of this report, NewGen has made certain assumptions and used certain considerations with respect to conditions which may exist or events which may occur in the future. While we believe these considerations and assumptions to be reasonable based upon conditions known to us as of the date of this report, they are dependent upon future events and actual conditions may differ from those assumed.

While we believe the use of such information and assumptions to be reasonable for the purposes of this report, we offer no other assurances with respect thereto, and some assumptions may vary significantly due to unanticipated events and circumstances. To the extent actual future conditions differ from those assumed herein or from the assumptions provided by others, the actual results may vary from those estimated.

The conclusion and opinions found in this report are made expressly subject to the following conditions and stipulations:

- The most likely purchaser of the System is assumed to be an investor-owned utility (IOU) capable of demonstrating the acquisition of the local government utility is in the public interest so that they may establish rate base using fair value as described in §62-133.1A of the North Carolina General Statutes.
- Extraordinary Assumptions³
 - The purchaser of the System can and would maintain or extend the useful life of the existing System through rehabilitation and good maintenance practices. NewGen assumes that with the right operating regime, maintenance plan, rehabilitation investments, and retirement and replacement of assets that have exceeded their useful service lives, the existing System can continue in service without significant service interruption or costly emergency repair.
 - NewGen used the Draper Aden Associates engineer report to allocate the book value of the System into different asset categories based on their weight relative to the overall system provided by the engineer's report. The book value of the System as of June 30, 2021 was provided by Carteret County in their Water System Audit FY21. NewGen applied an additional half year of depreciation to calculate the book value of the System as of January 1, 2022. This is described in greater detail later in the report.
- No soil analyses or geological studies were ordered or made in conjunction with this report, nor were any investigations of oil, gas, coal, or other subsurface mineral and use rights or conditions.
- No responsibility is assumed by NewGen for matters that are legal in nature, nor does NewGen render any opinion as to the title, land and/or land rights, which are assumed to be good and marketable. No opinion is intended to be expressed for matters that would require specialized investigation or knowledge beyond that normally used by an appraiser engaged in valuing the type of System described in this report.

³ Extraordinary assumptions, in the context of this analysis, are statements that are believed to be true but, if found to be false, could alter the opinions or conclusions of value. (USPAP Definitions)

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- NewGen made no determination as to the validity, enforceability, or interpretation of any law, contract, rule, or regulation applicable to the System or its operation. However, for the purposes of this report, NewGen assumed that all such laws, contracts, rules, and regulations will be fully enforceable in accordance with their terms as NewGen understands them and that the operators of the System will operate the System in accordance with all applicable laws, contracts, rules, and regulations. NewGen assumed that the System conforms to all applicable zoning and use regulations and restrictions.
- We assume there are no hidden conditions that would make the System more or less valuable.
- NewGen assumed the purchaser of the system would maintain the Verizon Annual Land Rental agreement, resulting in \$26,400 of non-rate revenue escalated annually at 2 percent.
- All existing liens and encumbrances have been disregarded and the value of the System was appraised as though free and clear and under responsible ownership.
- Mr. Mike Lane, Partner at NewGen, performed a limited field review of the System on April 29, 2022. Mr. Lane was accompanied by representatives from the Public Staff. Based on Mr. Lane's observations of the visible equipment, and discussions with the Public Staff, the System's assets seem in average condition for plants of comparable type and age.
- NewGen assumes the System has been, and will continue to be, operated in a reasonable and prudent manner consistent with industry practice.
- Substances contained in building structures such as asbestos, chemicals, toxins, wastes, or other potentially hazardous materials could, if present, adversely affect the value of the System. Unless otherwise stated in this report the appraiser did not consider the existence of hazardous substances, which may or may not be present at the System, in the development of the conclusion regarding FV. The stated value estimates are predicated on the assumption that there is no material at the System that would cause such a loss in value and, as such, are likely to represent the highest reasonable value of the System.
- Certain data and assumptions have been provided by third parties, including, but not limited to, historical costs, active connection counts, historical production volumes, plant balances, and replacement cost values for the System. NewGen reserves the right to adjust the results in this report as may be required by changes to these third-party assumptions.
- NewGen relied on data in Draper Aden Associates Engineering Assessment – Update to Present Value of Water System report, dated March 2022 and the Carteret County Water System Audit FY21, to develop indicators of value under the cost approach and to estimate future capital expenditures under the income approach.
- NewGen has not been made aware of any private easements owned by the System. Easements are assumed to be in the public right of way and not owned by the System. NewGen assumed the County has all easements necessary for the System to operate and, therefore, assigned no value to easements in this appraisal.
- NewGen estimated the value of the System irrespective of the source of capital used to construct the System (e.g., assumes no special treatment for contributed capital), consistent with the provisions in §62-133.1A of the North Carolina General Statutes.
- For the purpose of developing an opinion of the value of the System, NewGen assumed income taxes based on a Federal corporate income tax rate of 21 percent, which is the marginal Federal corporate

Assumptions, Considerations and Limiting Conditions

tax rate in effect at the date of valuation and a State corporate income tax rate of 2.5 percent, which is the marginal North Carolina corporate tax rate in effect at the date of valuation.

- NewGen applied a .55% state property tax rate to assessed property values to calculate taxes other than income tax.
- Under the income approach, the discount rate used to calculate the net present value of the projected cash flow stream is equal to the weighted average cost of capital for a typical purchaser of the System, rather than any actual financing associated with the System. For the purposes of this appraisal report, NewGen assumed the typical purchaser for the System would be a taxable entity, with a capital structure similar to that of an IOU. NewGen assumed that the capital structure of a typical purchaser will remain constant throughout the study period and will be made up of 48.9 percent debt and 51.1 percent equity (as shown in Exhibit 2, Tables D and G).
- The cost of debt used to develop the discount rate is assumed to be 4.29 percent based on an analysis of recent corporate bond interest rates (as shown in Exhibit 2, Tables D and G).
- It was assumed that a typical purchaser of the System would seek a return on capital similar to that of an IOU. For the analysis included in this report, NewGen assumed the return on equity to be used in the calculation of the discount factors to be 12.0 percent for the System (as shown in Exhibit 2, Tables C and F, respectively).
- The discount rate used in the appraisal report to determine the net present value of cash flow streams is based on the average of the Weighted Average Cost of Capital (WACC) developed using the Capital Asset Pricing Model (CAPM) using CRSP and Kroll risk premia approaches. The WACC developed using the CRSP risk premia is 7.8 percent. The WACC developed using the Kroll risk premia is 7.7 percent. The average of the two approaches, resulting in a WACC of 7.8 percent, was used in the analysis. Both the Kroll and CRSP risk and size premia are generally accepted approaches to estimating the cost of equity for IOUs that are not actively traded on a public exchange. NewGen did not find evidence to indicate that either of the cost of equity approaches should be rejected. The calculation of the discount rate is shown in Exhibit 2.
- NewGen recognizes that the current COVID-19 pandemic has resulted in unprecedented economic impacts and associated risks for companies that operate in certain sectors. This risk has an impact on the general interest rate environment. NewGen assumes that water utilities are not as susceptible to economic risk as some other industries, such as airlines or restaurants. For example, even if uncollectible accounts become elevated, there are mechanisms available to a regulated IOU to mitigate the financial harm of such circumstances. Thus, NewGen assumed it was reasonable not to make an additional adjustment to the risk premia for COVID in the WACC calculation.
- NewGen assumed a reasonable long-term inflation rate for the Subject Property to be 5.9 percent in 2022, 3.0 percent in 2023, 2.3 percent in 2024, and 2.1 percent for the rest of the study period based on the long-range consensus forecast of the Chained Gross Domestic Product as published in the December 10, 2021, issue of the *Blue Chip Economic Indicators* (Volume 37, Number 4). This long-range forecast is supported in a more recent report by *Blue Chip Economic Indicators* published in the March 11, 2022 report (Volume 47, No. 3).

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- NewGen assumed that the January 2021 connection counts escalated by one year of growth, for the System, provided by Draper Aden Associates, are an accurate representation of the total number of active connections across the System. NewGen escalated the active connection count annually by 1.13 percent⁴. This assumption is supported by the Capital Improvements DR Response Exhibit 4. This results in approximately 149 additional connections on the System at the end of the study period.
- NewGen relied on reported industry benchmarks⁵ escalated to 2022 dollars to establish a reasonable approximation of future annual operations and maintenance expenses that a potential purchaser would be likely to incur.
- Assumed useful lives for assets are based on the Draper Aden Associates engineering report.
- Assumed date in-service for assets on the System are based on the estimates provided in Draper Aden Associates engineering report.
- NewGen estimated plant additions and retirements based on the R2 Iowa Survivor Curve and the useful lives discussed above. NewGen applied the R2 Survivor Curve to develop a mortality dispersion and retirement frequency analysis for the System's plant accounts. The R2 Survivor Curve is commonly used in the mortality studies of utility property. The R2 Survivor Curve was applied to the original cost of each asset to calculate the annual retirements. The R2 Survivor Curve was applied to the replacement cost of each asset to calculate annual additions. The annual additions are escalated by inflation.
- The maximum amount of assumed accumulated depreciation under the cost approach analysis was 90 percent, leaving 10 percent of the estimated original cost value for older plant that has survived beyond the assumed useful life.
- For the Discounted Cash Flow (DCF) analysis in the income approach, a 2 percent annual depreciation rate was assumed for water plant assets and a 1.7 percent annual depreciation rate was assumed for distribution system assets. This assumption is based on the estimated useful lives and asset values provided in the Draper Aden Associates Engineering Report⁶. NewGen assumes the estimated depreciation rates are a reasonable representation of the average rate for existing plant that is not fully depreciated.
- Operating expenses were generally escalated at the long-term inflation rate described above per year, except water treatment and potable water service costs, which, in addition to inflation, are also increased in proportion to the assumed connection growth.
- For the purposes of performing the DCF analysis under the income approach, NewGen employed a 10 year study period (2022 to 2031).
- For the purposes of performing the valuation, NewGen assumed that a potential purchaser of the System would be able to operate the System in accordance with contractual terms and conditions of any existing contracts, and that any agreements, rights and easements would be assigned to the potential purchaser.
- Individuals affiliated with NewGen and contributing to this report are Mr. Mike Lane, ASA, Partner, Mr. Zachary Wright, ASA, Manager, and Mr. Nick Coomer, Consultant. Guidance on replacement costs, deficiencies, engineering assessments and descriptions of the System were provided by Dr. Steven Gandy, PhD, P.E. of Draper Aden Associates.

⁴ Annual growth rate from Capital Improvements DR Response Exhibit 4

⁵ 2019 AWWA Utility Benchmarking, Appendix B: FY18 Performance Summary by Type, page 173.

⁶ Draper Aden Associates Engineering Report dated March 2022

Section 3

PLANT DESCRIPTION AND CONDITION ASSESSMENT

Description of the Subject Properties

The description of the Subject Property was developed in coordination with information provided by Draper Aden Associates in its March 2022, report titled, “Update to Present Value of Water System” (attached as Exhibit 3).

Subject Property Location and Site Characteristics

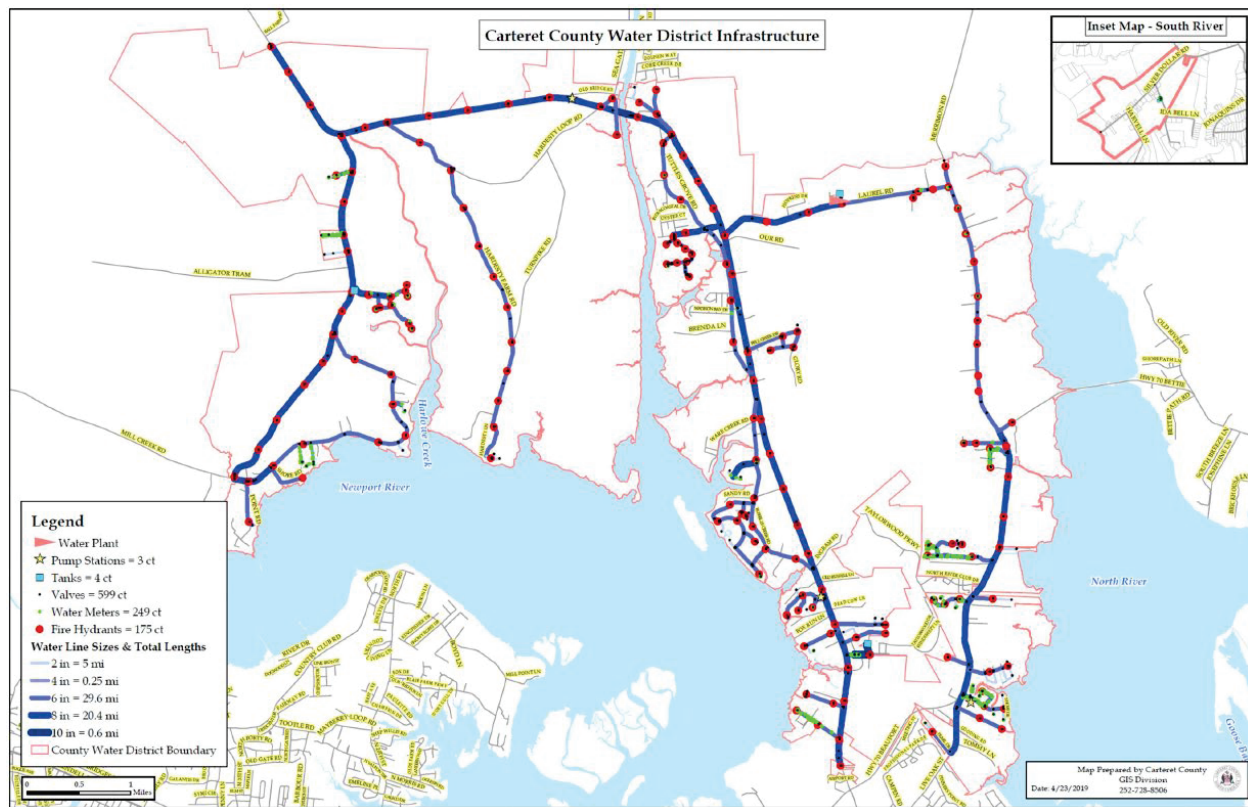
The Subject Property is owned by Carteret County and serves 1,253 customers⁷ within its service area.

The System relies on two groundwater wells for water supply. Water from the first well is treated at the Laurel Road Water Treatment Plant before it is pumped to three (3) elevated storage tanks for distribution within the community. These storage tanks are located with water lines extending to the Craven County line along NC Highway 101 and into the Mill Creek area. There are also water lines extending from the Beaufort Town limits along Highway 70 to East Carteret High School and along Merrimon Road to Laurel Road.

The System also includes a small water system approximately 20 miles north of Laurel Road and Merrimon Road intersection. This small system known as Merrimon Water System (MWS), serves approximately 25 – 30 customers. MWS receives water from the Jonaquins Creek well that consists of a well and an above-ground storage tank.

Figure 3-1 is a map showing the System’s infrastructure.

⁷ January 2021 Connection Count provided by the Draper Aden Associates Engineering Report dated March 2022

Section 3**Figure 3-1 Carteret County Water System Infrastructure**

Source: Draper Aden Associates Engineering Report

Condition of the System

NewGen performed a limited field review of the System for appraisal purposes to identify and observe the condition of the readily accessible portions of the System, which were limited to visual and external observations only. Based upon our observations, discussions with the Public Staff, and review of the Draper Aden Associates Engineering Report, the System's assets appear to generally be in average condition for plant of comparable type and age. NewGen assumes that with the right operating regime, maintenance plan and rehabilitation investments, as identified in the income approach, the existing System can continue in service without significant service interruption or costly emergency repair.

Section 4

FAIR VALUE ANALYSES

Introduction

There are three generally accepted valuation approaches that can be used to estimate the FV of the System: the cost approach; the income approach; and the sales comparison approach. Based on studies and analyses of the System, NewGen believes that all applicable approaches to valuation should be considered.

The premise of value selected for this appraisal is FV in continued use.

Cost Approach

The cost approach is based on the premise that an informed buyer would pay no more than the cost of producing a substitute property with the same function or utility as the property being valued. Two indicators of value that are commonly considered under the cost approach when valuing regulated public utility property are the original cost less accumulated depreciation (OCLD) value and the replacement cost new less accumulated depreciation (RCNLD) value.

OCLD is defined as the original cost of the property when it was first put into service as a public utility, less accumulated depreciation. The OCLD value is equal to the net book value of the property without accelerated depreciation. In this analysis, OCLD was estimated using the book value of the System provided by Carteret County in their most recent audited statement. For rate regulated utility property, the OCLD value is a relevant indicator of value because it is generally an approximation of the rate base value of the property, which is the value of the property on which the regulated utility is allowed to earn a return.

RCNLD is defined as the cost of reproducing a new replica of the property at current prices with the same or closely related materials, less accumulated depreciation. In contrast, replacement cost is defined as the current cost of a similar new property having the nearest equivalent utility as the property being appraised. Since there have not been recent major changes in the way water systems are constructed, there is typically not a significant difference between replacement cost and reproduction cost, and the terms are often used interchangeably for appraisal purposes. Although this method indicates the cost of building a comparable facility at present prices, it generally does not consider the inherent risk of construction and ownership, such as design defects, economic delays, cost overruns and natural disasters.

The cost approach indicators of value are adjusted for depreciation, which is the estimated loss in value of an asset, compared with a new asset. There are three basic types or causes of depreciation:

- **Physical deterioration** – The loss in value or usefulness resulting from the wear and tear of an asset in operation and exposure to various elements.
- **Functional obsolescence** – The loss in value or usefulness caused by inefficiencies or inadequacies of the property itself, when compared to a more efficient or less costly replacement property that new technology has developed.

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■ **Economic obsolescence** – The loss in value caused by factors external to the property.⁸

The estimated OCLD and RCNLD values of the System developed in this appraisal reflect an adjustment for physical deterioration, but not functional or economic obsolescence.

The Draper Aden Associates report did not identify the presence of Functional Obsolescence in the System. The System could be subject to economic obsolescence based on utility rate regulation, which restricts the earnings of the utility to an allowed rate of return times rate base. However, for the purpose of estimating FV, NewGen did not make a specific adjustment for economic obsolescence under the cost approach. The relationship between the OCLD (approximation of rate base) value and income value for regulated utility property will be discussed later in the report.

OCLD

The development of OCLD is shown in Exhibit 1, Table 1. NewGen utilized the replacement cost new (RCN) as developed for personal property by the engineer, Draper Aden Associates, and the replacement cost for real property based on the current assessed value for land, as reported by the Carteret County Property Record Card Search.⁹ The RCN values were used to allocate the net book value and original cost of the plant as recorded by Carteret County¹⁰ to the asset list identified in the engineering report.

Based on the assumed age of the assets and their assumed useful lives provided by the Draper Aden Associates Engineering Report, accumulated depreciation was estimated to reflect physical deterioration. If some of the assets are beyond their assumed useful life, regardless of their age, it was assumed that if an asset is still in service it still has value. Thus, the maximum amount of accumulated depreciation assumed in the analysis was 90 percent, leaving 10 percent of the estimated original cost value for each asset that is in service beyond its assumed useful life.

OCLD is equal to the net book value recorded on Carteret County's most recent water system audit plus an additional half year of depreciation to calculate the January 1, 2022 net book value, except for land value which is calculated using the real property value trended back to the earliest in-service asset date using the Consumer Price Index, as described in the extraordinary assumption mentioned above. The difference between the allocated original cost and OCLD results in accumulated depreciation for each asset.

RCNLD

The development of RCNLD is shown in Exhibit 1, Table 2. NewGen utilized the original cost provided by Carteret County plus an additional half year of depreciation to estimate the RCN. The Original Costs were trended forward to estimate the replacement cost if the asset was installed January 1, 2022 using the appropriate age of each asset and cost inflation index. The primary cost inflation index used for this purpose was the Handy Whitman Index of Public Utility Construction Costs (Handy-Whitman) for water utility assets in the South Atlantic Region (W-2), which provides data for most types of water assets. NewGen used the Consumer Price Index to trend the real property instead of the Handy-Whitman Index, as Handy-Whitman is a construction cost index and does not have data for land and land rights.

Subtracting the calculated accumulated depreciation from estimated replacement cost results in RCNLD.

⁸ American Society of Appraisers, *Valuing Machinery and Equipment*, Second Edition, pages 66-67.

⁹ Assessed real property value according to Carteret County Property Record Card Search for the System, for the most recent tax year available.

¹⁰ Water System Audit FY21 – Carteret County; Carteret County Depreciation Schedule

Again, the maximum amount of accumulated depreciation assumed in the analysis was 90 percent, leaving 10 percent of the estimated RCN value for each asset that is in service beyond its assumed useful life. NewGen then subtracted the accumulated depreciation from each item on the asset list to reflect physical deterioration based on age. NewGen utilized the current assessed value for real property for the RCN, as outlined in the OCLD discussion above.

NewGen tested for the presence of economic obsolescence by comparing the income approach value and the RCNLD and found that some economic obsolescence does exist. The value estimated in the income approach (see Table 4-3) is less than the RCNLD value. This represents, in some part, the impact of rate regulation on value. However, the RCNLD value shown in Table 4-1 does not include an adjustment for economic obsolescence.

The indicators of value under the cost approach are summarized in Table 4-1.

Table 4-1
Cost Approach

Item	Indicator of Value
Original Cost Less Depreciation	\$ 5,750,000
Replacement Cost New Less Depreciation *	\$ 13,032,000

* Excludes adjustment for economic obsolescence

Note: Table values may not equal exhibit values due to rounding to the nearest \$1,000

Sales Comparison Approach

The guideline transaction method under the sales comparison approach involves the review of recent sales of similar facilities between a willing buyer and a willing seller, who are unrelated, as an indication of the market price for such facilities. The guideline transaction method is primarily applicable to property that is readily substitutable and where a number of similar type properties have recently been sold. Caution must be exercised when using the sales comparison approach as an indicator of value for utility property. Normally, adjustments are made to the guideline sales transactions in order to correlate the sales price to the characteristics of the property being valued. However, there are many factors that can influence sales price including, among others, market area, growth prospects, age, and other considerations that may be reflected in the sales price. Each party's motivation can affect the negotiation and the terms of the sale. Strategic objectives are the driving motivator for some sales. These objectives are often kept confidential and are not available to an appraiser for evaluation. For this reason, NewGen generally uses the comparable sales method as a test of the reasonableness of values produced by the cost and income approaches.

Exhibit 1, Table 3 shows select sales transactions involving utility property in Texas, Illinois, Indiana, Pennsylvania, Washington, and Idaho that occurred from 2009 through 2021. There is a wide variation in the size, location, customer growth prospects, and type of plant for these sales and no attempt was made to adjust the sales to correlate with the characteristics of the System as doing so would be impractical. The diversity in the geography and marketplaces further reduces the applicability of these transactions to the System. There is not enough publicly available data about the transactions to place any significant weight on the guideline transaction method.

Examining the ratio of sales price to book value (OCLD) provides insight into the valuation of property between regulated utilities in willing buyer/willing seller transactions. The median ratio from the sales transactions (where book value was available) results in a sales price equal to 1.31 times book value. For

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rate regulated utilities, the book value of plant assets typically is the largest component of a utility’s rate base. The effect of utility rate regulation on value is discussed under the Income Approach in this section.

The sales price per customer is another metric that can be evaluated but should be used with caution as it can be misleading. For example, this metric may understate the value of systems that have made significant investments in facilities that will serve a much larger customer base than is currently being served. Nonetheless, the median ratio from the sales transactions (where number of customers was available) results in a sales price equal to \$2,000 per connection.

Table 4-2 shows these metrics as applied to the System under the sales comparison approach.

Table 4-2
Sales Comparison Approach

Metric	Median	Indicator of Value
Sales Price / OCLD	1.31	\$ 7,527,000
Sales Price / Customer	\$ 2,000	\$ 2,506,000

Note: Table values may not equal exhibit values due to rounding to the nearest \$1,000
The Sales Comparison Approach was not relied upon as an indicator of value, as discussed further in the following section of this report.

Income Approach

The income approach estimates the value of property by capitalizing or determining the present worth of anticipated economic benefits from the property as a going concern. Under this approach, the direct economic benefits derived from continued ownership of the property being valued are expressed in terms of free cash flow, which represents the total cash flow generated by the going concern that is available to the providers of both debt and equity capital.

The calculation of free cash flow is illustrated as follows:

- (1) Annual Operating Revenues
- (2) Less: Annual Operating Expenses
- (3) Equals: Pre-tax Net Operating Income
- (4) Less: Income Taxes
- (5) Equals: Earnings Before Interest, Depreciation & Amortization (EBIDA)
- (6) Less: Future Capital Expenditures
- (7) Less: Net Changes in Working Capital
- (8) Equals: Free Cash Flow

Under the discounted cash flow (DCF) method, the income indicator of value is equal to the sum of the present value of the projected free cash flows plus the present value of the projected terminal value. In this analysis, the series of annual free cash flows from 2022 to 2031 was discounted to the date of value using a 7.8 percent discount rate, which is equal to the WACC developed in Exhibit 2. For the terminal (or residual) value, the projected free cash flow in year 2031 was capitalized into perpetuity at the discount rate less a growth rate equal to 2.1 percent, which is the projected rate of growth in earnings, and then discounted back to 2022.

Effect of Utility Rate Regulation on Value

When estimating the value of regulated utility property, it is important to understand utility rate regulation and how regulated utility rates are generally determined. In exchange for being granted the right to be the monopoly service provider, the utility agrees to have its rates regulated by the state public utilities commission, in this case the North Carolina Utilities Commission.

Under utility rate regulation, a utility is allowed to charge rates that produce forecasted revenues equal to the utility's total revenue requirement. The term "revenue requirement" refers to the utility's total cost of serving its customers, including the opportunity to earn a reasonable rate of return on invested capital. Under the utility basis of ratemaking used by IOUs and adopted by the North Carolina Utilities Commission, the total revenue requirement is generally equal to the utility's reasonable operating expenses, depreciation expense, taxes, and the utility's authorized rate of return times rate base.

Rate base is the value of property on which a utility is allowed to earn its authorized rate of return and is generally equal to the original cost less accumulated depreciation (OCLD) value of the utility's plant in service, plus miscellaneous items, such as working capital, materials and supplies, and minus miscellaneous items, such as customer advances and deferred taxes. The utility's authorized rate of return is developed based on a weighted average cost of capital (WACC).

As a result of rate regulation, and the way utility rates are developed, the income value of regulated utility property is typically related to the rate base value of the property, as described below.

The income approach estimates the value of property by capitalizing or determining the present worth of anticipated economic benefits from the property as a going concern. Under the direct capitalization of earnings method, the income value of the property is estimated by capitalizing (i.e., dividing) the net income associated with the property for a one-year period by an appropriate capitalization rate. This shown in Equation (1) below:

$$(1) \quad \text{Value} = \frac{(\text{Revenues} - \text{Expenses})}{\text{Capitalization Rate}}$$

The capitalization rate shown in Equation (1) is equal to the WACC for a hypothetical buyer of the property less assumed growth in earnings. In theory, the income value for a regulated utility should approximate its rate base value since this is the value of the utility's investment on which it is allowed to earn its authorized rate of return. Further, generally speaking, the largest contributor to rate base is OCLD.

Under cost-of-service ratemaking procedures, utility rates are designed to produce revenues that recover the utility's expenses (including depreciation and taxes) plus a return on rate base, as shown in Equation (2) below:

$$(2) \quad \text{Revenues} = \text{Expenses} + (\text{Rate of Return})(\text{Rate Base})$$

Equation (2) can be restated as follows:

$$(3) \quad \text{Rate Base} = \frac{(\text{Revenues} - \text{Expenses})}{\text{Rate of Return}}$$

By comparing Equations (1) and (3), one can see that the capitalized income value for regulated utility property is generally equivalent to its rate base value with an adjustment for expected future growth.

Under the principle of substitution, an informed buyer would pay no more than the cost of producing a substitute property with the same utility as the property being valued. However, an informed buyer would generally also pay no more than the income value of the property. Therefore, in the case of rate regulated utility property, the income value is generally close to the rate base (approximately OCLD) value, assuming that utility rates are based on cost of service. This is because the net income (return) a utility can earn is

Section 4

determined based on the utility’s authorized rate of return multiplied by the value of its rate base, which is primarily composed of OCLD.

Discounted Cash Flow Analysis

NewGen developed a regulated retail revenue requirement for the System and performed a DCF analysis to identify the income value for the System. The revenue requirement developed for the System is shown in Exhibit 1, Table 6; the WACC analysis used to develop the discount rate is shown in Exhibit 2; and the DCF analysis is shown in Exhibit 1, Table 8. The income approach reflects how most rate regulated utility property is valued (shown in Table 4-3). These results are discussed further in Section 5 of this report.

Alternative Scenario

NewGen understands that the purchaser of this system is Carolina Water Service, Inc (CWS), and that CWS’ approved rate of return is approximately 7.14%. An alternate scenario analyzing the indicator of value under the income approach using the CWS’ approved rate of return results in a value of \$7,592,000. To develop an opinion of fair value under the income approach, NewGen relied on the estimated weighted average cost of capital for a hypothetical purchaser, as discussed in greater detail in Section 2 of this report. Utilizing the approved rate of return for a specific IOU would indicate the investment value of the System and not the fair value. For this reason, NewGen did not consider this alternative scenario when determining the fair value of the System.

Table 4-3
Income Approach

Item	Indicator of Value
Discounted Cash Flow (DCF) Analysis	\$ 7,332,000

Note: Table values may not equal exhibit values due to rounding to the nearest \$1,000

Section 5 CONCLUSIONS

Discussion

Cost Approach

The premise of the cost approach is that an informed buyer would pay no more than the cost of producing a substitute property with the same function or utility as the property being valued. Further, for rate regulated utility property, the OCLD value is important as it is the primary component of traditionally developed rate base.

Sales Comparison Approach

It is often difficult or impossible to properly adjust utility comparable sales transactions to match the characteristics of utility property being valued. The number of critical factors that influence utility property values are numerous, and the terms of some transactions that impact value are kept confidential, preventing consideration of all relevant factors by appraisers. Nonetheless, the sales comparison approach can be a useful means to confirm conclusions from the other two approaches to estimate value.

In the case of water systems, and utilities in general, comparing sales of systems is a very difficult undertaking. No two utilities are exactly alike – the technologies employed differ; the customer composition, use, and growth all differ; and the regulatory environments sometimes differ. These potential differences make the adjustment necessary to compare two different utilities exceedingly difficult under the Sales Comparison Approach. For example, the Carteret County Water System has a significantly lower than average customer density, resulting in an indicated value based on the median sales price per customer to be 3 times lower than the indicated value based on the median sales price to book value ratio. This highlights the fundamental difficulties of the sales comparison approach. Further, the motivation of each party to a transaction can affect the negotiation and the terms of sale. For instance, strategic objectives are sometimes the driving motivator for transactions. These objectives are often kept confidential and, therefore, are not available to an appraiser for evaluation. Thusly, few public utility appraisers rely heavily on the Sales Comparison Approach.

NewGen did not rely upon the sales comparison approach due to the overall lack of comparable, complete transaction data. While the information from this approach is presented in this report, it is important to note that no weight was placed on the sales comparison approach as an indicator of value due to the weaknesses identified.

Income Approach

The income approach value developed in this appraisal is within the range of results from the cost approach. NewGen often finds the indication of value under the income approach for rate regulated property is greater than the OCLD value due to the property's opportunity to earn an approved rate of return on rate base and expected future growth in earnings. The range is most commonly between 1.2 to 1.5 times OCLD, and the income approach value of the System is within this range at approximately

Section 5

1.28 times OCLD. The indicator of value under the income approach is lower than the RCNLD indication of value, which also indicates the presence of some economic obsolescence due to rate regulation.

Fair Value

After careful consideration of the indicators of value developed under the various approaches, given the relative strengths and weaknesses of each, and based on our studies and analyses and the assumptions used therein, including the information provided by others upon which we have relied, we are of the opinion that a purchaser would be willing to purchase the System for a price reflective of the value of all prospective future cash flows, which is represented by the income approach to value.

A buyer, evaluating the System on a purely financial basis, should not be willing to pay more than the income value unless external factors specific to the buyer's situation are influencing the purchase, which would be at odds with the definition of FV. Therefore, we are of the opinion that the indication of value for the System under the income approach best represents the FV of the System.

The results of our analyses to estimate the FV of the System as of January 1, 2022, are summarized in Table 5-1.

Table 5-1
Summary of Value Indicators

	Value Indicators
Cost Approach	
OCLD	\$ 5,750,000
RCNLD *	\$ 13,032,000
Sales Comparison Approach	Not relied upon
Income Approach	
DCF	\$ 7,332,000
Fair Market Value	\$ 7,332,000

* Excludes adjustment for economic obsolescence

Note: Table values may not equal exhibit values due to rounding to the nearest \$1,000

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Section 6

APPRAISAL CERTIFICATION

I, the undersigned, certify that, to the best of my knowledge and belief:

- The statements of fact contained in this report are true and correct.
- The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
- I have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved.
- I have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding the agreement to perform this assignment.
- I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
- My engagement in this assignment was not contingent upon developing or reporting predetermined results.
- My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the Client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
- My analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the *Uniform Standards of Professional Appraisal Practice (2020-2021 Edition) (extended through December 31, 2022)*.
- Mr. Mike Lane made a personal inspection of the property that is the subject of this report on April 29, 2022
- Mike Lane, ASA (Partner at NewGen), Zak Wright, ASA (Manager at NewGen), and Nick Coomer (Consultant at NewGen) provided significant personal property appraisal assistance to the person signing this certification.

Respectfully Submitted,

NewGen Strategies & Solutions, LLC

DocuSigned by:

6387C69774AD4F9...
Mike Lane, ASA
July 7, 2022



NewGen
Strategies & Solutions

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EXHIBIT 1: APPRAISAL ANALYSES

REPORT

**FAIR VALUE APPRAISAL OF THE
WATER SYSTEM IN CARTERET COUNTY**



**Carteret County Water System
Cost Approach
Original Cost Less Depreciation - Water System
Table 1**

Line No.	System / Asset Description (c)	Date In Service [1] (d)	Engineer Replacement Cost [2]	Engineer Cost Allocation % [3]	Original Cost [4]	Expired Life (%) [7] (p)	Accumulated Depreciation (r)	Original Cost Less Depreciation (OCLD) (s)
Carteret County Water System								
1	Water Plant							
2	Booster Pump 1	2012	\$ 250,000	0.99%	\$ 120,230	53.7%	\$ 64,510	\$ 55,719
3	Booster Pump 2	2012	300,000	1.18%	144,275	53.7%	77,413	66,863
4	Booster Pump 3	2012	300,000	1.18%	144,275	53.7%	77,413	66,863
5	Water Tank 1	1988	850,000	3.35%	408,780	53.7%	219,336	189,445
6	Water Tank 2	2012	900,000	3.55%	432,826	53.7%	232,238	200,589
7	Water Tank 3	2012	1,000,000	3.94%	480,918	53.7%	258,042	222,876
8	SCADA System	2012	150,000	0.59%	72,138	53.7%	38,706	33,431
9	Well House	2012	350,000	1.38%	168,321	53.7%	90,315	78,007
10	Jonaquins Creek Well House and Storage	2012	564,204	2.22%	271,336	53.7%	145,588	125,748
11	Fire Hydrants	2012	500,000	1.97%	240,459	53.7%	129,021	111,438
12	Water Treatment Plants	2012	2,000,000	7.89%	961,836	53.7%	516,084	445,752
13	Total Water Plant		\$ 7,164,204		\$ 3,445,395		\$ 1,848,665	\$ 1,596,730
14	Distribution System							
15	2" PVC	1988	\$ 924,000	3.64%	\$ 444,368	53.7%	\$ 238,431	\$ 205,938
16	4" PVC	1988	59,400	0.23%	28,567	53.7%	15,328	13,239
17	6" PVC	1988	9,095,280	35.87%	4,374,085	53.7%	2,346,964	2,027,121
18	6" Ductile	1988	305,500	1.20%	146,920	53.7%	78,832	68,089
19	8" PVC	1988	7,313,390	28.84%	3,517,142	53.7%	1,887,161	1,629,980
20	8" Ductile	1988	242,625	0.96%	116,683	53.7%	62,607	54,075
21	10" PVC	1988	253,440	1.00%	121,884	53.7%	65,398	56,486
22	Total Distribution System		\$ 18,193,635		\$ 8,749,648		\$ 4,694,721	\$ 4,054,927
23	Real Property [8]							
24	Laurel Road Aerial Tank	1988			\$ 10,688	0.0%	\$ -	\$ 10,688
25	Laurel Road Treatment Plant	1988			24,050	0.0%	-	24,050
26	Jonaquins Creek Water House	1988			7,588	0.0%	-	7,588
27	Taylor Farm Elevated tank	1988			12,741	0.0%	-	12,741
28	Booster Pump Station #1	1988			17,055	0.0%	-	17,055
29	Booster Pump Station #2	1988			9,270	0.0%	-	9,270
30	Booster Pump Station #3	1988			8,070	0.0%	-	8,070
31	Mayflower Drive Elevated Tank	1988			8,665	0.0%	-	8,665
32	Total Real Property				\$ 98,126		\$ -	\$ 98,126
33	Carteret County Water System - Total		\$ 25,357,839		\$ 12,293,170		\$ 6,543,386	\$ 5,749,784

Footnotes:

- [1] Assuming Month and Day in service are July 1st for each asset
 [2] Replacement cost estimates according to Draper Aden Associates Engineering report dated March 2022
 [3] Allocation percentage of Draper Aden Associates Engineering report to each line item
 [4] Original Cost from Carteret County Audit FY21, Costs are allocated based off of the Draper Aden Associates Engineering report dated March 2022
 [5] Assuming a standard 365 day year (rounded to the nearest whole year)
 [6] Based on NewGen's experience appraising similarly-sized systems, Draper Aden Associates Engineering Report, depreciation study work and testimony, etc.
 [7] Expired life is equal to total system depreciation % according to Carteret County Depreciation Schedule
 [8] Date in Service based on the year of the oldest installed assets according to asset inventory in Draper Aden Associates Engineering Report. Reproduction value is assumed equal to Carteret County's property records. Book value of land is trended to estimated original cost using CPI.

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**Carteret County Water System
Cost Approach
Replacement Cost Less Depreciation
Table 2**

Handy Whitman Cost Index															
Line No.	System / Asset Description	Date In Service [1]	Original Cost [2]	Age as of January 1, 2022 [3]	Line Number	Install Year	Current	Index Factor	Replacement Cost	Useful Life [4]	Annual Depreciation (%)	Expired Life (%) [5]	RCN Annual Depreciation	RCN Accumulated Depreciation	Replacement Cost New Less Depreciation (RCNLD)
	(c)	(d)		(h)					(e)	(i)	(j)	(k)	(l)	(m)	(n)
<u>Carteret County Water System</u>															
1	Water Plant														
2	Booster Pump 1	2012	\$ 120,230	9.5	9	788	1,451	1.84	\$ 221,451	50	2.0%	19.0%	\$ 4,429	\$ 42,076	\$ 179,376
3	Booster Pump 2	2012	144,275	9.5	9	788	1,451	1.84	265,742	50	2.0%	19.0%	5,315	50,491	215,251
4	Booster Pump 3	2012	144,275	9.5	9	788	1,451	1.84	265,742	50	2.0%	19.0%	5,315	50,491	215,251
5	Water Tank 1	1988	408,780	33.5	23	220	913	4.15	1,696,439	50	2.0%	67.0%	33,929	1,136,614	559,825
6	Water Tank 2	2012	432,826	9.5	23	798	913	1.14	495,046	50	2.0%	19.0%	9,901	94,059	400,987
7	Water Tank 3	2012	480,918	9.5	23	798	913	1.14	550,051	50	2.0%	19.0%	11,001	104,510	445,541
8	SCADA System	2012	72,138	9.5	8	500	671	1.34	96,906	20	5.0%	47.5%	4,845	46,030	50,876
9	Well House	2012	168,321	9.5	8	500	671	1.34	226,113	50	2.0%	19.0%	4,522	42,962	183,152
10	Jonaquins Creek Well House and Storage	2012	271,336	9.5	8	500	671	1.34	364,497	50	2.0%	19.0%	7,290	69,254	295,243
11	Fire Hydrants	2012	240,459	9.5	42	693	1,158	1.67	401,923	60	1.7%	15.8%	6,699	63,638	338,285
12	Water Treatment Plants	2012	961,836	9.5	8	500	671	1.34	1,292,076	50	2.0%	19.0%	25,842	245,494	1,046,582
13	Total Water Plant		\$ 3,445,395						\$ 5,875,985				\$ 119,087	\$ 1,945,618	\$ 3,930,367
14	Distribution System														
15	2" PVC	1988	\$ 444,368	33.5	38	189	423	2.24	\$ 995,998	60	1.7%	55.8%	\$ 16,600	\$ 556,099	\$ 439,899
16	4" PVC	1988	28,567	33.5	38	189	423	2.24	64,028	60	1.7%	55.8%	1,067	35,749	28,279
17	6" PVC	1988	4,374,085	33.5	38	189	423	2.24	9,803,983	60	1.7%	55.8%	163,400	5,473,890	4,330,092
18	6" Ductile	1988	146,920	33.5	35	264	968	3.66	537,921	65	1.5%	51.5%	8,276	277,236	260,685
19	8" PVC	1988	3,517,142	33.5	38	189	423	2.24	7,883,248	60	1.7%	55.8%	131,387	4,401,480	3,481,768
20	8" Ductile	1988	116,683	33.5	35	264	968	3.66	427,211	65	1.5%	51.5%	6,572	220,178	207,033
21	10" PVC	1988	121,884	33.5	38	189	423	2.24	273,188	60	1.7%	55.8%	4,553	152,530	120,658
22	Total Distribution System		\$ 8,749,648						\$ 19,985,577				\$ 331,856	\$ 11,117,163	\$ 8,868,415
23	Real Property [8]														
24	Laurel Road Aerial Tank	1988	\$ 10,688	33.5	CPI	119	282	2.38	\$ 25,428		0.0%	0.0%	\$ -	\$ -	\$ 25,428
25	Laurel Road Treatment Plant	1988	24,050	33.5	CPI	119	282	2.38	57,220		0.0%	0.0%	-	-	57,220
26	Jonaquins Creek Water House	1988	7,588	33.5	CPI	119	282	2.38	18,054		0.0%	0.0%	-	-	18,054
27	Taylor Farm Elevated tank	1988	12,741	33.5	CPI	119	282	2.38	30,312		0.0%	0.0%	-	-	30,312
28	Booster Pump Station #1	1988	17,055	33.5	CPI	119	282	2.38	40,576		0.0%	0.0%	-	-	40,576
29	Booster Pump Station #2	1988	9,270	33.5	CPI	119	282	2.38	22,055		0.0%	0.0%	-	-	22,055
30	Booster Pump Station #3	1988	8,070	33.5	CPI	119	282	2.38	19,200		0.0%	0.0%	-	-	19,200
31	Mayflower Drive Elevated Tank	1988	8,665	33.5	CPI	119	282	2.38	20,615		0.0%	0.0%	-	-	20,615
32	Total Real Property		\$ 98,126						\$ 233,460				\$ -	\$ -	\$ 233,460
33	Carteret County Water System - Total		\$ 12,293,170						\$ 26,095,023				\$ 450,943	\$ 13,062,781	\$ 13,032,241

Footnotes:

[1] Assuming Month and Day in service are July 1st for each asset

[2] Original Cost from Table 1

[3] Assuming a standard 365 day year (rounded to the nearest whole year)

[4] Based on NewGen's experience appraising similarly-sized systems, Draper Aden Associates Engineering Report, depreciation study work and testimony, etc.

[5] Assets still in service are assumed to have a minimum remaining useful life of 10%

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**Carteret County Water System
Sales Comparison Approach
Table 3**

Line No.	Transaction Number	Year of Agreement	State	Application Number [1]	Seller	Purchaser	Utility	Date Finalized	Sales Price	Number of Customers	Price / Customer	OCLD (Book Value)	Price / OCLD
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
1	1	2009	TX	36569-S	Pecan Utilities, Inc. & Cavern Springs Water Company	Aqua Utilities, Inc. dba Aqua Texas, Inc.	Water	4/25/2011	\$ 428,000	214	\$2,000		
2	2	2010	TX	36872-S	Monarch Utilities I, L.P.	City of Southmayd	Water	1/26/2012	\$ 1,057,849	247	\$4,283		
3	3	2010	TX	36726-S and 36959-S	Carrizo Water Corporation & Blue Water Key Water System	Aqua Utilities, Inc. dba Aqua Texas, Inc.	Water	6/17/2011	\$ 790,000	210	\$3,762		
4	4	2010	TX	36917-S	1404 Properties LTD	Aqua Utilities, Inc. dba Aqua Texas, Inc.	Water	1/23/2012	\$ 124,000	62	\$2,000		
5	5	2011	TX	37036-S	B & J Water Company	Utility Investment Company, Inc.	Water	6/25/2012	\$ 857,000	330	\$2,597	\$ 608,149	1.41
6	6	2011	TX	36935-S	Elm Creek Water Supply Corporation	City of Troy	Water	4/27/2012	\$ 73,095	41	\$1,783		
7	7	2011	TX	37221-S	AD & JA Corp (Silver Ridge Water System)	Lass Water Company	Water	10/25/2012	\$ 5,000	26	\$192		
8	8	2011	TX	37167-S	Johnson Utilities, Inc.	Lake Livingston Water Supply and Sewer Service Corp	Water	10/15/2012	\$ 16,000	21	\$762		
9	9	2011	TX	37177-S	Texas H2O, Inc.	SJWTX, Inc. dba Canyon Lake Water Service Company	Water	6/28/2012	\$ 462,600	257	\$1,800	\$ 182,888	2.53
10	10	2012	TX	37292-S	Back Forty Water Company	Woodbine Water Supply Corp	Water	11/19/2012	\$ 250,000	102	\$2,451		
11	11	2014	TX	43048	Bluebonnet Rural Water Corporation	Corix Utilities	Water	8/14/2015	\$ 1,107,675	1,103	\$1,004	\$ 2,392,753	0.46
12	12	2015	TX	45639	Mitchell County Utility Company	Corix Utilities	Water	2/3/2017	\$ 577,500	879	\$657	\$ 410,055	1.41
13	13	2015	TX	44024	Union Hill Water Supply Corporation	Aqua Utilities, Inc. dba Aqua Texas, Inc.	Water	2/8/2016	\$ 348,000	174	\$2,000	\$ 737,637	0.47
14	14	2015	TX	45317	Romark Utility Company	Monarch Water Utilities	Water	12/5/2016	\$ 125,000	125	\$1,000		
15	15	2016	TX	46127	Westwood Utility Corporation	City of Fairfield	Water	12/18/2017	\$ 3,000,000	420	\$7,143		
16	16	2016	TX	46077	Brushy Creek Municipal Utility District	Aqua Texas, Inc.	Water	4/12/2017	\$ 50,000	207	\$242	\$ 151,087	0.33
17	17	2017	IL	N/A	City of Farmington	Illinois American Water	Water	4/1/2017	\$ 3,750,000	1,063	\$3,528	\$ 2,864,569	1.31
18	18	2017	TX	47888	Deer Creek Ranch Water Co	SJWTX, Inc. dba Canyon Lake Water Service Company	Water	11/29/2018	\$ 2,700,000	756	\$3,571	\$ 1,135,450	2.38
19	19	2018	TX	48565	Aqua Texas, Inc.	Town of Buffalo Gap, Texas	Water		\$ 397,500	269	\$1,478		
20	20	2018	TX	47922	Dal-High Water LLC	Monarch Water Utilities	Water	11/2/2018	\$ 55,200	46	\$1,200	\$ 44,862	1.23
21	21	2018	TX	48543	Chambers Meadow Estate Water Company	HILCO United Services, Inc	Water	9/9/2019	\$ 45,000	57	\$789		
22	22	2018	TX	48863	Henry Brookshire Jr	TWS Holdings	Water	9/13/2019	\$ 90,000	119	\$756	\$ 64,155	1.40
23	23	2019	TX	49230	Beverly Lee Minaldi	Simply Aquatics Inc	Water	4/19/2020	\$ 35,000	47	\$745		
24	24	2019	TX	49231	Ponder Enterprises, Inc	Lone Star Water Company	Water	5/20/2020	\$ 1,345,000	332	\$4,051	\$ 1,274,847	1.06
25	25	2019	TX	49714	Paul B Hill	Megan Estes	Water	3/13/2020	\$ 112,500	50	\$2,250	\$ 120,160	0.94
26	26	2019	TX	50085	Castle Water Inc	Horseshoe Bend Water Company	Water	6/10/2020	\$ 500,000	507	\$986	\$ 92,920	5.38
27	27	2019	TX	50122	Madera Valley WSC	Town of Pecos City	Water	4/14/2020	\$ 968,348	66	\$14,672		
28	28	2019	TX	50213	Wolforth Place Water System	City of Wolfforth	Water		\$ 200,000	183	\$1,093		
29	29	2019	IL	N/A	Village of Lenore	Illinois American Water	Water	4/1/2020	\$ 100,000	68	\$1,471		
30	30	2019	IL	N/A	Village of Sidney	Illinois American Water	Water		\$ 2,300,000	546	\$4,212		
31	31	2019	TX	50279	Twin Creek Park Water System	Creedmoor-Maha Water Supply Corp	Water		\$ 210,000	92	\$2,283		
32	32	2019	TX	50335	City of Kaufman	College Mound Special Utility District	Water		\$ 75,000	150	\$500		
33	38	2019	PA	N/A	Steelton	American Water	Water	10/9/2019	\$ 21,800,000	2,400	\$9,083		
34	39	2019	IN	N/A	Lake Station	American Water	Water	10/22/2019	\$ 20,700,000	3,270	\$6,330		
35	33	2020	TX	50480	Crystal Clear Special Utility District	City of San Marcos	Water		\$ 1,144,680	489	\$2,341		
36	34	2020	TX	50616	David and Glenda Stegent	Corix Utilities	Water		\$ 100,000	75	\$1,333		
37	35	2020	TX	50712	Jarrell-Schwertner WSC	City of Jarrell	Water		\$ 1,200,000	111	\$10,811		
38	36	2020	TX	50816	Vinton Hills Alagre, LLC	Village of Vinton	Water		\$ 453,000	83	\$5,458		

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**Carteret County Water System
Sales Comparison Approach
Table 3**

Line No.	Transaction Number	Year of Agreement	State	Application Number [1]	Seller (e)	Purchaser (f)	Utility (g)	Date Finalized (h)	Sales Price (i)	Number of Customers (j)	Price / Customer (k)	OCLD (Book Value) (l)	Price / OCLD (m)
39	37	2020	TX	51605	LC Water Development, LP	Yancey Water Supply Corporation	Water		\$ 20,000	113	\$177		
40	40	2020	WA	N/A	Rainier View Water	California Water Service Group	Water	6/4/2020	\$ 37,600,000	18,500	\$2,032		
41	41	2021	TX	51911	The Commons Water Supply, Inc	Aqua Texas, Inc.	Water		\$ 4,000,000	992	\$4,032		
42	42	2021	IN	N/A	Town of Lowell	American Water	Water	12/28/2021	\$ 24,500,000	4,000	\$6,125		
43	43	2021	ID	N/A	Eagle Water	Suez Water	Water	12/10/2021	\$ 10,000,000	4,000	\$2,500		
44													
45													

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[illegible]



**Carteret County Water System
Income Approach
Income Approach General Assumptions
Table 4**

Line No.		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
1	Annual Escalators	Blue Chip Economic Indicators, Vol. 37, No. 4, December 10, 2021									
2	General Inflation		5.9%	3.0%	2.3%	2.1%	2.1%	2.1%	2.1%	2.1%	2.1%
3	Long Term Earnings Growth Rate		2.1%								
4	Retail Customers										
5	January 2021 Active Water Connection Count [1]		1,253								
6	Assumed Annual Customer Growth [2]		1.13%								
7	Forecasted Water Connection Count		1,267	1,281	1,296	1,311	1,325	1,340	1,356	1,371	1,402
8	General Assumptions										
9	WACC		7.80%	see Exhibit 2							
10	Federal Income Tax Rate		21.00%								
11	State Income Tax Rate		2.50%								
12	Effective Income Tax Rate		22.98%								
13	State Property tax rate		0.55%								
14	Implied Depreciation Rate										
		OC	Depr	Annual Depreciation Rate	Accumulated Depreciation	OC					
15											
16	Water Plant	\$ 3,445,395	\$ 69,827	2.0%	\$ 1,848,665	\$ 1,596,730					
17	Distribution System	\$ 8,749,648	\$ 145,286	1.7%	\$ 4,694,721	\$ 4,054,927					
18	Average Water Consumption [3]	125	Gallons per Day								
19	Total Water Consumption	57,168,125	Gallons per Year								
20	Feet in a Mile	5,280	Feet								
21	Distribution System [4]	Feet of Pipe	Miles of Pipe								
22	2" PVC	26,400	5.00								
23	4" PVC	1,320	0.25								
24	6" PVC	151,588	28.71								
25	6" Ductile	4,700	0.89								
26	8" PVC	104,477	19.79								
27	8" Ductile	3,235	0.61								
28	10" PVC	3,168	0.60								
29	Service Laterals, PVC	3,759	0.71	Service Laterals assumed 3 linear feet per connection							
			56.56								

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**Carteret County Water System
Income Approach
Income Approach General Assumptions
Table 4**

Line No.	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
30	AWWA Benchmarking Metrics (Appendix B - FY 2018) Trended to 2022 [5]									
31	Treatment O&M Cost of Water Service (\$/MG)	\$	542	\$481 benchmark 2018 value escalated to 2022 at long-term inflation rate						
32	Distribution O&M Cost of Water Service (\$/100 miles of pipe)	\$	849,122	\$753,350 benchmark 2018 value escalated to 2022 at long-term inflation rate						
33	Total O&M Cost of Potable Water Services (\$/MG)	\$	2,860	\$2,537 benchmark 2018 value escalated to 2022 at long-term inflation rate						
34	Treatment O&M Cost of Water Service (\$/MG)	\$	30,994							
35	Distribution O&M Cost of Water Service (\$/100 miles of pipe)	\$	480,280							
36	Total O&M Cost of Potable Water Services (\$/MG)	\$	163,474							
37	Date of Valuation	1/1/2022								
38	Plant Book Value [6]									
39	Net Plant Book Value (June 30, 2021)	\$	5,759,214							
40	Calculated Net Plant Book Value (January 1, 2022)	\$	5,651,658							
41	Original Cost	\$	12,195,043							
42	Verizon Annual Land Rental [7]	\$	26,400							
43	Verizon Annual Land Rental Escalator		2.0%							
Footnotes:										
[1] January 2021 Connection Count provided by the Draper Aden Associates Engineering report dated March 2022										
[2] Growth rate from Capital Improvements DR Response Exhibit 4										
[3] 2021 Average Daily Consumption, 2021 Carteret County Audit, Pg. 209										
[4] Distribution System length provided by Draper Aden Associates Engineering Report, Revised March 2022										
[5] AWWA Benchmarking Metrics (Appendix B - FY 2018), Escalated to 2022 Dollars										
[6] Plant book value from Carteret County Audit FY21										
[7] Verizon Annual Land Rental as stated in Verizon Contract										

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**Carteret County Water System
Income Approach
Plant in Service
Table 5**

Line No.	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Notes
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
1 GROSS PLANT IN SERVICE											
2 Land											
3 Beginning of Year Balance	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	
4 Additions	-	-	-	-	-	-	-	-	-	-	
5 Retirements	-	-	-	-	-	-	-	-	-	-	
6 End of Year Balance	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	\$ 98,126	
7											
8 Water Plant											
9 Beginning of Year Balance	\$ 3,445,395	\$ 3,454,839	\$ 3,465,834	\$ 3,478,280	\$ 3,492,254	\$ 3,507,908	\$ 3,525,392	\$ 3,544,896	\$ 3,566,608	\$ 3,590,704	
10 Additions	17,050	19,047	20,951	22,964	25,149	27,491	30,055	32,826	35,775	38,981	(1)
11 Retirements	(7,607)	(8,052)	(8,505)	(8,990)	(9,495)	(10,007)	(10,551)	(11,114)	(11,679)	(12,273)	(2)
12 End of Year Balance	\$ 3,454,839	\$ 3,465,834	\$ 3,478,280	\$ 3,492,254	\$ 3,507,908	\$ 3,525,392	\$ 3,544,896	\$ 3,566,608	\$ 3,590,704	\$ 3,617,411	
13											
14 Distribution System											
15 Beginning of Year Balance	\$ 8,749,648	\$ 8,800,205	\$ 8,858,880	\$ 8,923,793	\$ 8,996,458	\$ 9,077,711	\$ 9,166,359	\$ 9,265,082	\$ 9,374,677	\$ 9,493,796	
16 Additions	90,044	100,044	107,289	117,018	127,673	136,125	148,360	161,419	172,105	187,026	(1)
17 Retirements	(39,487)	(41,370)	(42,376)	(44,353)	(46,420)	(47,477)	(49,636)	(51,825)	(52,985)	(55,253)	(2)
18 End of Year Balance	\$ 8,800,205	\$ 8,858,880	\$ 8,923,793	\$ 8,996,458	\$ 9,077,711	\$ 9,166,359	\$ 9,265,082	\$ 9,374,677	\$ 9,493,796	\$ 9,625,569	
19											
20 Total System											
21 Beginning of Year Balance	\$ 12,293,170	\$ 12,353,170	\$ 12,422,840	\$ 12,500,199	\$ 12,586,838	\$ 12,683,745	\$ 12,789,877	\$ 12,908,105	\$ 13,039,411	\$ 13,182,626	
22 Additions	107,094	119,091	128,240	139,982	152,822	163,616	178,415	194,245	207,879	226,007	
23 Retirements	(47,094)	(49,421)	(50,880)	(53,343)	(55,915)	(57,484)	(60,188)	(62,939)	(64,664)	(67,526)	
24 End of Year Balance	\$ 12,353,170	\$ 12,422,840	\$ 12,500,199	\$ 12,586,838	\$ 12,683,745	\$ 12,789,877	\$ 12,908,105	\$ 13,039,411	\$ 13,182,626	\$ 13,341,107	
25											
26 ACCUMULATED DEPRECIATION											
27 Land											
28 Beginning of Year Balance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
29 Depreciation Accrual	-	-	-	-	-	-	-	-	-	-	
30 Retirements	-	-	-	-	-	-	-	-	-	-	
31 End of Year Balance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
32											
33 Water Plant											
34 Beginning of Year Balance	\$ 1,848,665	\$ 1,910,885	\$ 1,972,852	\$ 2,034,588	\$ 2,096,092	\$ 2,157,374	\$ 2,218,461	\$ 2,279,358	\$ 2,340,087	\$ 2,400,692	
35 Depreciation Accrual	69,827	70,018	70,241	70,493	70,777	71,094	71,448	71,844	72,284	72,772	(3)
36 Retirements	(7,607)	(8,052)	(8,505)	(8,990)	(9,495)	(10,007)	(10,551)	(11,114)	(11,679)	(12,273)	
37 End of Year Balance	\$ 1,910,885	\$ 1,972,852	\$ 2,034,588	\$ 2,096,092	\$ 2,157,374	\$ 2,218,461	\$ 2,279,358	\$ 2,340,087	\$ 2,400,692	\$ 2,461,190	
38											

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Line No.		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Notes
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
39	Distribution System											
40	Beginning of Year Balance	\$ 4,694,721	\$ 4,800,519	\$ 4,905,275	\$ 5,009,999	\$ 5,113,823	\$ 5,216,787	\$ 5,320,043	\$ 5,422,612	\$ 5,524,632	\$ 5,627,311	
41	Depreciation Accrual	145,286	146,125	147,100	148,177	149,384	150,733	152,205	153,844	155,664	157,642	(3)
42	Retirements	(39,487)	(41,370)	(42,376)	(44,353)	(46,420)	(47,477)	(49,636)	(51,825)	(52,985)	(55,253)	
43	End of Year Balance	\$ 4,800,519	\$ 4,905,275	\$ 5,009,999	\$ 5,113,823	\$ 5,216,787	\$ 5,320,043	\$ 5,422,612	\$ 5,524,632	\$ 5,627,311	\$ 5,729,700	
44												
45	Total System											
46	Beginning of Year Balance	\$ 6,543,386	\$ 6,711,405	\$ 6,878,127	\$ 7,044,587	\$ 7,209,915	\$ 7,374,161	\$ 7,538,504	\$ 7,701,970	\$ 7,864,719	\$ 8,028,002	
47	Depreciation Accrual	215,113	216,144	217,341	218,671	220,161	221,827	223,653	225,688	227,948	230,414	
48	Retirements	(47,094)	(49,421)	(50,880)	(53,343)	(55,915)	(57,484)	(60,188)	(62,939)	(64,664)	(67,526)	
49	End of Year Balance	\$ 6,711,405	\$ 6,878,127	\$ 7,044,587	\$ 7,209,915	\$ 7,374,161	\$ 7,538,504	\$ 7,701,970	\$ 7,864,719	\$ 8,028,002	\$ 8,190,890	
50												
51	NET PLANT IN SERVICE (BOY)	\$ 5,749,784	\$ 5,641,765	\$ 5,544,713	\$ 5,455,612	\$ 5,376,923	\$ 5,309,584	\$ 5,251,374	\$ 5,206,135	\$ 5,174,692	\$ 5,154,624	

(1) Additions are based on the Capital expenditure analysis retirement rate calculated from the survivor curve times RCN escalated at inflation and the Capital expenditure analysis retirement rate calculated from the survivor curve times the original cost and the Capital expenditure analysis retirement rate calculated from the survivor curve times the original cost and the Capital expenditure analysis retirement rate calculated from the survivor curve times the original cost



**Carteret County Water System
Income Approach
Revenue Requirement - Water System
Table 6**

Line No.		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Notes
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
1	Total Utility Plant	\$ 12,293,170	\$ 12,353,170	\$ 12,422,840	\$ 12,500,199	\$ 12,586,838	\$ 12,683,745	\$ 12,789,877	\$ 12,908,105	\$ 13,039,411	\$ 13,182,626	(1)
2	Accumulated Depreciation	(6,543,386)	(6,711,405)	(6,878,127)	(7,044,587)	(7,209,915)	(7,374,161)	(7,538,504)	(7,701,970)	(7,864,719)	(8,028,002)	(1)
3	Net Utility Plant	\$ 5,749,784	\$ 5,641,765	\$ 5,544,713	\$ 5,455,612	\$ 5,376,923	\$ 5,309,584	\$ 5,251,374	\$ 5,206,135	\$ 5,174,692	\$ 5,154,624	
4	Add: Cash Working Capital	\$ 169,008	\$ 174,644	\$ 179,246	\$ 183,615	\$ 188,095	\$ 192,689	\$ 197,401	\$ 202,233	\$ 207,190	\$ 212,273	(2)
5	Add: Inventory	-	-	-	-	-	-	-	-	-	-	
6	Less: Accumulated Deferred Income Tax	(14,669)	(89,415)	(156,677)	(217,168)	(271,523)	(320,358)	(364,225)	(403,702)	(444,045)	(486,385)	(3)
7	Less: CIAC	-	-	-	-	-	-	-	-	-	-	
8	Less: Customer Deposits	-	-	-	-	-	-	-	-	-	-	
9	Rate Base	\$ 5,904,123	\$ 5,726,994	\$ 5,567,281	\$ 5,422,058	\$ 5,293,495	\$ 5,181,915	\$ 5,084,549	\$ 5,004,667	\$ 4,937,837	\$ 4,880,512	
10	After-tax Rate of Return (WACC)	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	7.8%	(4)
11	Allowed Return (after income tax)	\$ 460,522	\$ 446,706	\$ 434,248	\$ 422,921	\$ 412,893	\$ 404,189	\$ 396,595	\$ 390,364	\$ 385,151	\$ 380,680	
12	Return (before income tax)	\$ 597,886	\$ 579,949	\$ 563,775	\$ 549,069	\$ 536,050	\$ 524,751	\$ 514,891	\$ 506,802	\$ 500,034	\$ 494,229	(5)
13	O&M Expenses											(6)
14	Potable Water Service	\$ 163,474	\$ 170,280	\$ 176,165	\$ 181,897	\$ 187,816	\$ 193,927	\$ 200,237	\$ 206,752	\$ 213,479	\$ 220,425	
15	Treatment	30,994	32,284	33,400	34,487	35,609	36,767	37,964	39,199	40,474	41,791	
16	Distribution	480,280	494,688	506,066	516,693	527,544	538,622	549,933	561,482	573,273	585,312	
17	Taxes Other Than Income Taxes	1,284	1,323	1,353	1,381	1,410	1,440	1,470	1,501	1,533	1,565	(7)
18	Depreciation Expense	215,113	216,144	217,341	218,671	220,161	221,827	223,653	225,688	227,948	230,414	
19	Total Operating Expenses	\$ 891,144	\$ 914,719	\$ 934,325	\$ 953,129	\$ 972,539	\$ 992,583	\$ 1,013,257	\$ 1,034,622	\$ 1,056,707	\$ 1,079,507	
20	Revenue Requirement	\$ 1,489,029	\$ 1,494,668	\$ 1,498,100	\$ 1,502,199	\$ 1,508,589	\$ 1,517,334	\$ 1,528,148	\$ 1,541,423	\$ 1,556,741	\$ 1,573,736	(8)

Footnotes:

- (1) See Table 5
 (2) Based on 90 day buffer for cash expenses
 (3) See Table 7
 (4) See WACC analysis, Exhibit 2, Table H
 (5) Based on current marginal Federal Income Tax rate
 (6) Distribution expenses estimated using 2018 AWWA Benchmarks (Exhibit B) and then inflated at 2.1% per year, Treatment and Potable Water Service Cost expense are escalated using inflation and assumed customer growth.
 (7) Assessed value of Real Property multiplied by the property tax rate escalated at inflation
 (8) Return plus total operating expenses

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**Carteret County Water System
Income Approach
Tax Depreciation - Water System
Table 7**

Line No.	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Notes
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
1 Total Plant Tax Depreciation Basis											
2 MACRS 20-Year	3.750%	7.219%	6.677%	6.177%	5.713%	5.285%	4.888%	4.522%	4.462%	4.461%	(1)
3											
4 Capital											
5 Initial Purchase of System	\$ 7,331,829	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	(2)
6 Annual Capital Additions	107,094	119,091	128,240	139,982	152,822	163,616	178,415	194,245	207,879	226,007	(3)
7	\$ 7,438,924	\$ 119,091	\$ 128,240	\$ 139,982	\$ 152,822	\$ 163,616	\$ 178,415	\$ 194,245	\$ 207,879	\$ 226,007	
8											
9 Annual Tax Depreciation											
10 Initial Purchase & Year 1 Capital	\$ 278,960	\$ 537,016	\$ 496,697	\$ 459,502	\$ 424,986	\$ 393,147	\$ 363,615	\$ 336,388	\$ 331,925	\$ 331,850	
11 Capital Additions - Year 2		4,466	8,597	7,952	7,356	6,804	6,294	5,821	5,385	5,314	
12 Capital Additions - Year 3			4,809	9,258	8,563	7,921	7,326	6,777	6,268	5,799	
13 Capital Additions - Year 4				5,249	10,105	9,347	8,647	7,997	7,398	6,842	
14 Capital Additions - Year 5					5,731	11,032	10,204	9,440	8,731	8,077	
15 Capital Additions - Year 6						6,136	11,811	10,925	10,107	9,347	
16 Capital Additions - Year 7							6,691	12,880	11,913	11,021	
17 Capital Additions - Year 8								7,284	14,023	12,970	
18 Capital Additions - Year 9									7,795	15,007	
19 Capital Additions - Year 10										8,475	
20	\$ 278,960	\$ 541,482	\$ 510,103	\$ 481,961	\$ 456,741	\$ 434,387	\$ 414,588	\$ 397,512	\$ 403,545	\$ 414,702	
21											
22 Book Depreciation	\$ 215,113	\$ 216,144	\$ 217,341	\$ 218,671	\$ 220,161	\$ 221,827	\$ 223,653	\$ 225,688	\$ 227,948	\$ 230,414	(4)
23											
24 Difference Btwn Book and Tax Depreciation	\$ 63,847	\$ 325,338	\$ 292,762	\$ 263,290	\$ 236,580	\$ 212,560	\$ 190,934	\$ 171,824	\$ 175,597	\$ 184,288	
25											
26 Deferred Income Tax (State and Federal)											
27 Annual	\$ 14,669	\$ 74,746	\$ 67,262	\$ 60,491	\$ 54,354	\$ 48,836	\$ 43,867	\$ 39,477	\$ 40,343	\$ 42,340	
28 Accumulated (for Rate Base development)	14,669	89,415	156,677	217,168	271,523	320,358	364,225	403,702	444,045	486,385	

Footnotes:

- (1) Modified Accelerated Cost Recovery System (MACRS), IRS Publication 946 (2018), Table A-1 (Half-Year Convention); Water plant is Asset Class 49.3 uses 20-year MACRS
- (2) Income Value (Table 8)
- (3) Capital Additions as shown on Table 5
- (4) Depreciation as show on Table 5

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**Carteret County Water System
Income Approach
Discounted Cash Flow Analysis - Water System
Table 8**

Line No.	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Notes
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
1 Rate Revenue	\$ 1,489,029	\$ 1,494,668	\$ 1,498,100	\$ 1,502,199	\$ 1,508,589	\$ 1,517,334	\$ 1,528,148	\$ 1,541,423	\$ 1,556,741	\$ 1,573,736	(1)
2 Other Revenue	\$ 26,400	\$ 26,928	\$ 27,467	\$ 28,016	\$ 28,576	\$ 29,148	\$ 29,731	\$ 30,325	\$ 30,932	\$ 31,550	
3 Total Revenue	\$ 1,515,429	\$ 1,521,596	\$ 1,525,567	\$ 1,530,214	\$ 1,537,166	\$ 1,546,482	\$ 1,557,879	\$ 1,571,749	\$ 1,587,673	\$ 1,605,286	
4 O&M Expenses											
5 Potable Water Service	\$ 163,474	\$ 170,280	\$ 176,165	\$ 181,897	\$ 187,816	\$ 193,927	\$ 200,237	\$ 206,752	\$ 213,479	\$ 220,425	
6 Treatment	30,994	32,284	33,400	34,487	35,609	36,767	37,964	39,199	40,474	41,791	
7 Distribution	480,280	494,688	506,066	516,693	527,544	538,622	549,933	561,482	573,273	585,312	
8 Taxes Other Than Income Taxes	1,284	1,323	1,353	1,381	1,410	1,440	1,470	1,501	1,533	1,565	(1)
9 Depreciation Expense (Book)	215,113	216,144	217,341	218,671	220,161	221,827	223,653	225,688	227,948	230,414	(1)
10 Total Operating Expenses	\$ 891,144	\$ 914,719	\$ 934,325	\$ 953,129	\$ 972,539	\$ 992,583	\$ 1,013,257	\$ 1,034,622	\$ 1,056,707	\$ 1,079,507	
11 Income Tax Calculation											
12 Operating Income	\$ 624,286	\$ 606,877	\$ 591,242	\$ 577,085	\$ 564,626	\$ 553,899	\$ 544,622	\$ 537,127	\$ 530,966	\$ 525,779	
13 Add Back: Book Depreciation	215,113	216,144	217,341	218,671	220,161	221,827	223,653	225,688	227,948	230,414	
14 Less: Tax Depreciation	(278,960)	(541,482)	(510,103)	(481,961)	(456,741)	(434,387)	(414,588)	(397,512)	(403,545)	(414,702)	(2)
15 Operating Income for Tax Purposes	\$ 560,439	\$ 281,539	\$ 298,480	\$ 313,795	\$ 328,046	\$ 341,339	\$ 353,688	\$ 365,303	\$ 355,369	\$ 341,491	
16											
17 Combined Income Tax Rate	22.98%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	23.0%	
18											
19 Income Taxes	\$ 128,761	\$ 64,683	\$ 68,576	\$ 72,094	\$ 75,369	\$ 78,423	\$ 81,260	\$ 83,928	\$ 81,646	\$ 78,458	
20 Operating Income	\$ 597,886	\$ 579,949	\$ 563,775	\$ 549,069	\$ 536,050	\$ 524,751	\$ 514,891	\$ 506,802	\$ 500,034	\$ 494,229	
21 Less: Income Taxes	(128,761)	(64,683)	(68,576)	(72,094)	(75,369)	(78,423)	(81,260)	(83,928)	(81,646)	(78,458)	
22 Net Income	\$ 469,125	\$ 515,265	\$ 495,200	\$ 476,975	\$ 460,681	\$ 446,328	\$ 433,631	\$ 422,873	\$ 418,388	\$ 415,771	
23 Add Back: Book Depreciation	215,113	216,144	217,341	218,671	220,161	221,827	223,653	225,688	227,948	230,414	
24 Earnings Before Interest, Depreciation & Amort.	\$ 684,238	\$ 731,409	\$ 712,540	\$ 695,646	\$ 680,842	\$ 668,155	\$ 657,285	\$ 648,561	\$ 646,336	\$ 646,185	
25 Less: Capital Expenditures	\$ (107,094)	\$ (119,091)	\$ (128,240)	\$ (139,982)	\$ (152,822)	\$ (163,616)	\$ (178,415)	\$ (194,245)	\$ (207,879)	\$ (226,007)	(3)
26 Less: Changes in Working Capital	-	(5,636)	(4,602)	(4,369)	(4,480)	(4,594)	(4,712)	(4,832)	(4,956)	(5,083)	(4)
27 Free Cash Flow	\$ 577,143	\$ 606,682	\$ 579,698	\$ 551,295	\$ 523,540	\$ 499,945	\$ 474,158	\$ 449,484	\$ 433,500	\$ 415,095	
28 Capitalized Cash Flow Analysis											
29 Weighted Average Cost of Capital (WACC)	7.80%	(5)									
30 Long Term Earnings Growth Rate	2.10%	(6)									
31 Capitalization Rate	5.70%	(7)									
32 Net Present Value of 2021-2030 Free Cash Flow	\$ 3,549,756	(8)									
33 Terminal Value	\$ 7,435,305	(9)									
34 Net Present Value of Terminal Value	3,782,073	(10)									
35 Income Value	\$ 7,331,829	(11)									



Carteret County Water System
Income Approach
Discounted Cash Flow Analysis - Water System
Table 8

Line No.	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Notes
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Footnotes: (1) See Table 6 (2) See Table 7 (3) See Table 5 (4) Based on 90 day buffer for cash expenses (5) See WACC analysis, Exhibit 2, Table H (6) Blue Chip Economic Indicators, Vol. 37, No. 4, December 10, 2021 (7) WACC minus Earnings Growth Rate (8) Free Cash Flows discounted at the WACC (9) Estimated Free Cash flow in 2031 divided by Capitalization Rate (10) Terminal Value discounted at the WACC from 2031 to 2022 (11) Sum of the NPV of 2021-2030 Free Cash Flows Plus the NPV of the Terminal Value											

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EXHIBIT 2: COST OF CAPITAL (DISCOUNT RATE)

REPORT

**FAIR VALUE APPRAISAL OF THE
WATER SYSTEM IN CARTERET COUNTY**



**Carteret County Water System
Water System Valuation
Estimation of Weighted Average Cost of Capital as of January 1, 2022**

TABLE A: UNLEVERING WATER UTILITY PROXY GROUP BETAS

Row No	Column A Company	Column B Ticker Symbol	Column C % Debt in Capital Structure [1]	Column D Tax Rate [2]	Column E % Equity in Capital Structure	Column F Levered (Published) Beta [3]	Column G Unlevered Beta [4]
1	American States Water	AWR	48.5%	24.0%	51.5%	0.65	0.38
2	American Waterworks	AWK	61.5%	23.5%	38.5%	0.90	0.41
3	Artesian Resources Corp	ARTNA	45.0%	21.0%	55.0%	0.75	0.46
4	California Water Services Group	CWT	45.5%	21.0%	54.5%	0.70	0.42
5	Essential Utilities	WTRG	56.0%	6.0%	44.0%	1.00	0.46
6	Middlesex Water	MSEX	41.5%	21.0%	58.5%	0.70	0.45
7	SJW Group	SJW	51.0%	21.5%	49.0%	0.80	0.44
8	York Water Company	YORW	42.5%	21.0%	57.5%	0.85	0.54
9	Average		48.9%	19.9%	51.1%	0.79	0.44

Footnotes:

[1] Capital structure as forecast by Value Line Investment Survey reports prior to date of valuation.

[2] Income tax rates as forecast by Value Line Investment Survey reports prior to date of valuation. Assumed 21% rate if forecast

[3] Most recent Value Line Investment Survey reports prior to date of valuation.

[4] See *Valuing a Business*, Fourth Edition, by Pratt, Reilly and Schweihs, page 169. Published betas for publicly traded stocks reflect the actual financial leverage of the company's capital structure. An unlevered beta is the beta the company would have if it had no debt. Unlevering the betas removes the effect of each company's financial leverage on the guideline betas.

$$B_U = B_L / (1 + (1 - t)(W_d/W_e))$$

where B_U = Beta unlevered

B_L = Beta levered

t = tax rate for company

W_d = Percent debt in the capital structure

W_e = Percent equity in the capital structure



**Carteret County Water System
Water System Valuation
Estimation of Weighted Average Cost of Capital as of January 1, 2022**

TABLE B: RELEVING GUIDELINE COMPANY BETA

	Column A	Column B	Column C	Column D	Column E
Row No.	Debt [1]	Tax Rate	Equity	Unlevered Beta	Beta Levered [2]
1	48.9%	19.9%	51.1%	0.44	0.78

Footnotes:

[1] Average debt, tax rate and beta for water utility proxy group shown in Table A

[2] Levered beta calculated based on formula provided in *Valuing a Business*, Fourth Edition, by Pratt, Reilly and Schweihs, page 169.

$$B_L = B_U [1 + (1-t)(W_d/W_e)]$$

where B_U = Beta unlevered

B_L = Beta levered

t = tax rate for company

W_d = Percent debt in the capital structure

W_e = Percent equity in the capital structure

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**Carteret County Water System
Water System Valuation
Estimation of Weighted Average Cost of Capital as of January 1, 2022**

TABLE C: CAPITAL ASSET PRICING MODEL (USING CRSP SIZE PREMIA) [1]

Row No.	Column A	Column B	Column C	Column D	Column E	Column F
	Methodology				Amount	Notes
1	Step One:		Risk Free Investment Rate		1.94%	Risk Free Rate (RFR) was selected, representing the 20-Year Treasury Constant Maturity Rate available on 12/31/2021 at the Federal Reserve Bank.
2	Step Two:	<i>Plus</i>	Equity Risk Premium [2]		6.2%	
3		<i>Times</i>	Beta		0.78	Table B: Levered Beta
4					4.8%	Valuation Date Average Market Return
5	Step Three:	<i>Plus</i>	Size Premium [3]		5.26%	CRSP Size Premium (Return in Excess of CAPM), Decile 10
6	Step Four:	<i>Equals</i>			12.0%	Cost of Equity

Footnotes:

[1] Source: Business Valuation Resources Cost of Capital Professional

[2] The Historical ERP calculated using the S&P 500 average annual return of 11.98% derived from CRSP data for the 1928 - 2021 period and a 5.78% 20-year T-Bond average annual return (Reconstructed) for the same timeframe.

[3] The Size Premium was based on CRSP decile 10 which included 622 firms with an equity market capitalization size ranging from \$10,588,000 to \$289,007,000 in Q4 2021. The mean annual return for the S&P 500 for the same period was 11.98%. The difference between the CRSP mean decile return and the S&P 500 mean return was adjusted by the beta of CRSP decile 10 of 1.39.



Carteret County Water System
Water System Valuation
Estimation of Weighted Average Cost of Capital as of January 1, 2022

TABLE D: WEIGHTED AVERAGE COST OF CAPITAL (USING CRSP SIZE PREMIA)

Column	Column	Column	Column	Column
A	B	C	D	E
Row No.	Description			Amount
1	Percent Debt in Capital Structure [1]			48.9%
2	Cost of Debt [2]			4.29%
3	Effective Tax Rate [3]			23.0%
4	Percent Equity in Capital Structure			51.1%
5	Cost of Equity [4]			12.0%
6	Weighted Average Cost of Capital [5]			7.8%
7	[1]	Average capital structure based on utility proxy group. See Table A		
8	[2]	Corporate Bond Rates, Baa (%) - 2022 Forecast Annual Average - Blue Chip Economic Indicators - Volume 38, No. 1		
9	[3]	Effective Federal and State tax at 21% federal income tax rate and 2.5% state income tax		
10	[4]	Average of cost of equity using the Capital Asset Pricing Model in Table C		
11	[5]	$WACC = W_d(k_d)(1-t) + W_e(k_e)$		
12		where		
13		W_d = Percent debt in the capital structure		
14		k_d = Cost of debt		
15		t = tax rate		
16		W_e = Percent equity in the capital structure		
17		k_e = Cost of equity		

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**Carteret County Water System
Water System Valuation
Estimation of Weighted Average Cost of Capital as of January 1, 2022**

TABLE E: CRSP Capital Asset Pricing Model Assumptions

The 01/01/2022 cost of capital analysis for Carteret County was completed on 05/12/2022 using the Q4 2021 Cost of Capital Professional study. Returns were selected and calculated for the time period ranging from 1928 to 2021 using an arithmetic mean.

The Capital Asset Pricing Model was selected based on professional judgment for the calculation of the cost of equity capital. The various components selected are as follow:

CoE = RFR + (Beta*ERP) + SP

12.04% = 1.94% + [0.78 * 6.21%] + 5.26%

A **1.94%** Risk Free Rate (RFR) was selected, representing the 20-Year Treasury Constant Maturity Rate available on 1/01/2021 at the Federal Reserve Bank.

A beta of **0.78** was selected based on professional judgment.

A **6.21%** Equity Risk Premium (ERP) was selected, representing the Historical ERP calculated using the S&P 500 average annual return of 11.98% derived from CRSP data for the 1928 - 2021 period and a 5.78% 20-year T-Bond average annual return (Reconstructed) for the same timeframe.

A **5.26%** Size Premium (SP) was selected. The Size Premium was based on CRSP decile 10 which included 622 firms with an equity market capitalization size ranging from \$10,588,000 to \$289,007,000 in Q4 2021. The mean annual return for the S&P 500 for the same period was 11.98%. The difference between the CRSP mean decile return and the S&P 500 mean return was adjusted by the beta of CRSP decile 10 of 1.39.

Cost of Capital Professional returned a **12.04%** cost of equity capital for Carteret County as of 01/01/2022 based on the Capital Asset Pricing Model.

In addition, the Weighted Average Cost of Capital (WACC) was also computed for Carteret County. Given the components selected the formula used is as follows:

WACC = (CoE * We) + (KdPreTax * (1 - t) * Wd)

7.59% = (12.04% * 51.10%) + (4.29% * (1 - 22.98%) * 48.90%)

An equity percentage of **51.10%** was selected.

A debt percentage of **48.90%** was selected.

A borrowing rate (pre-tax cost of debt) of **4.29%** was selected.

A tax rate of **22.98%** was selected.

Cost of Capital Professional returned a **7.8%** WACC for Carteret County as of 01/01/2022.

Disclaimer: Items included in the analysis based on professional judgment were not provided by Cost of Capital Professional. Additionally, the cost of equity model (Build-Up or CAPM) is chosen by the professional based on professional judgment using skill, knowledge, experience, education, and training.

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**Carteret County Water System
Water System Valuation
Estimation of Weighted Average Cost of Capital as of January 1, 2022**

TABLE F: CAPITAL ASSET PRICING MODEL (USING KROLL RISK PREMIA)

	Column A	Column B	Column C	Column D	Column E	Column F
Row No.		Methodology			Amount	Notes
1	Step One:		Risk Free Investment Rate [1]		2.5%	Kroll Normalized Risk Free Rate
2	Step Two:	Plus	Equity Risk Premium [1]		5.5%	Kroll Recommended U.S. Equity Risk Premium
3		Times	Beta		0.78	Table B: Levered Beta
4					4.3%	Valuation Date Average Market Return
5	Step Three:	Plus	Size Premium [1]		5.2%	Kroll Size Premium (Portfolio 25)
6	Step Four:	Equals			12.0%	Cost of Equity
7	Footnotes:					
8	[1] Source: Kroll Cost of Capital Navigator					



**Carteret County Water System
Water System Valuation
Estimation of Weighted Average Cost of Capital as of January 1, 2022**

TABLE G: WEIGHTED AVERAGE COST OF CAPITAL (USING KROLL RISK PREMIA)

	Column A	Column B	Column C	Column D
Row				
No.	Description			Amount
1	Percent Debt in Capital Structure [1]			48.9%
2	Cost of Debt [2]			4.29%
3	Tax Rate [3]			23.0%
4	Percent Equity in Capital Structure			51.1%
5	Cost of Equity [4]			12.0%
6	Weighted Average Cost of Capital [5]			7.7%

Footnotes:

- [1] Average capital structure based on utility proxy group. See Table A
- [2] Corporate Bond Rates, Baa (%) - 2022 Forecast Annual Average - Blue Chip Economic Indicators - Volume 38, No. 1
- [3] Effective Federal and State tax at 21% federal income tax rate and 2.5% state income tax
- [4] Average of cost of equity using the Capital Asset Pricing Model in Table F
- [5] $WACC = W_d(k_d)(1-t) + W_e(k_e)$
- where
- W_d = Percent debt in the capital structure
- k_d = Cost of debt
- t = tax rate
- W_e = Percent equity in the capital structure
- k_e = Cost of equity



Carteret County Water System
Water System Valuation
Estimation of Weighted Average Cost of Capital as of January 1, 2022

TABLE H: WEIGHTED AVERAGE COST OF CAPITAL

Column		Column	Column	Column
A		B	C	D
Row No.	Description			Amount
1	CRSP Risk Premia WACC			7.8%
2	Kroll Risk Premia WACC			7.7%
3	Average Weighted Cost of Capital [1]			7.8%

Footnotes:
[1] Average WACC = (CRSP WACC + D&P WACC) / 2

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EXHIBIT 3: DRAPER ADEN ASSOCIATES ENGINEER REPORT

REPORT

**FAIR VALUE APPRAISAL OF THE
WATER SYSTEM IN CARTERET COUNTY**

Carteret County, NC
Laurel Road / Merrimon Water Systems

UPDATE TO PRESENT VALUE OF WATER SYSTEM

December 2021
Revised March 2022

Prepared by:



Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

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DAA PN: 2102326

*Update to Present Value of Water System**December 2021**Revised March 2022**Carteret County, NC*

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Background

Carteret County owns and operates two groundwater wells for water supply. The first well is located just East of Sowers Drive on Laurel Road, Beaufort, NC 28516, and the extracted groundwater is treated at the onsite Laurel Road Water Treatment Plant (WTP) before is it pumped to three (3) elevated storage tanks for distribution within the community. The system serves approximately 1,226 customers. The County also owns and operates a small water system known as the Merrimon Water System, approximately 20 miles north of Laurel Rd and Merrimon Rd intersection. The water system consists of the Jonaquins Creek Well and an above-ground water storage tank, and it serves approximately 27 customers. (The attached Appendix A system map further details the layout and location of the system and components.)

Draper Aden performed a water system feasibility study in 2019 to look at a merger with a local municipality, which established a monetary value for the County's water system assets, among other conclusions. This document is meant to update that number to a more current value. The original report can be found in Appendix B.

Assumptions / Limitations

In order to assess the changes to the value of the water systems owned by Carteret County, the following was assumed:

- Conditions of Carteret County's water system assets stated in the 2019 Feasibility Study have not significantly changed and remains an accurate depiction of current conditions.
- Book Value approach was used in estimating the value of fixed assets. Straight Line Depreciation was used to estimate depreciated value of water system assets. For the purpose of estimation, the salvage value of each system component was assumed to be zero dollars (\$0).
- The 2019 analysis for the projected 2020 fiscal budget is accurate to current financial conditions; an updated analysis for 2020 and 2021 budgets and expenses was not performed.
- To account for inflation since the 2019 feasibility study, several present book values which were estimated in the 2019 report have been increased by 5%.



*Update to Present Value of Water System**December 2021**Revised March 2022**Carteret County, NC*

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Results / Conclusions

The water system assets owned by Carteret County have an estimated value of approximately \$12.7 million. A detailed breakdown of this value can be found in Tables 1 and 2.

However, if the water system assets were to be replaced in full today, that number would need to be increased significantly due to rising construction costs, particularly over the past few years. The estimated replacement cost for the Carteret County water system assets is \$24.8 million. A detailed cost for replacement of the water system can be found in Table 3.

The remainder of the major findings and recommendations reported in the 2019 feasibility study hold true.

Attachments:

Table 1: Estimated Book Value of Carteret County Water System

Table 2: Present Book Value of Carteret County Water System

Table 3: Estimated Replacement Cost for Water System Assets

Appendix A: Figure 1 Carteret County Water System Map

Appendix B: 2019 Feasibility Study for Water System Merger

Table 1. Estimated Book Value of Carteret County Water System

Assets	Date of Acquisition	Design Life (yrs)	Historical Cost (\$)	Total Useful life (months)	Net Amount to Be Depreciated (\$)	Accumulated Depreciation (\$)	Current Depreciation (\$)	Total Depreciation (\$)	Present Book value of Asset (\$)
Booster Pump 1	2012	50	174,284	600	174,284	26,433	3,486	29,919	144,365
Booster Pump 2	2012	50	253,111	600	253,111	38,389	5,062	43,451	209,661
Booster Pump 3	2012	50	<u>253,111</u>	600	253,111	38,389	5,062	<u>43,451</u>	<u>209,661</u>
Subtotal			680,507				Subtotal	116,820	563,686
Water Tank 1	1988	50	619,263	600	619,263	391,168	12,385	403,553	215,710
Water Tank 2	2012	50	689,091	600	689,091	104,512	13,782	118,294	570,797
Water Tank 3	2012	50	<u>765,262</u>	600	765,262	116,065	15,305	<u>131,370</u>	<u>633,892</u>
Subtotal			2,073,616				Subtotal	653,217	1,420,399
Total			2,754,123				Total	770,037	1,984,085

Update to Present Value of Water System

December 2021

Revised March 2022

Carteret County, NC

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Table 2. Present Book Value of Carteret County Water System

System No	Description	Present Book value of Asset (\$)
SCADA		
Booster Pump House1	SCADA System*	294,000
Land		
Laurel Road Aerial Tank	Land Property	25,428
Laurel Road Treatment Plant	Land Property	57,220
Jonaquins Creek Water House	Land Property	26,097
Aerial Tank	Land Property	130,312
Booster Pump Station-1	Land Property	40,578
Booster Pump Station-2	Land Property	35,312
Booster Pump Station-3	Land Property	34,160
Elevated Tank	Land Property	20,615
	Sub Total	369,722
Well House	Water withdrawal house*	210,000
Jonaquins Creek Well House and Storage	Merrimon Water System*	420,000
Fire Hydrants	Fire rescue purposes	300,000
Water Treatment Plants	Supply/Distribution*	1,575,000
Piping System		
2" PVC	(26,400 ft, \$10/ft)	264,000
4" PVC	(1,320 ft, \$16/ft)	21,120
6" PVC	(151,588 ft, \$24/ft)	3,638,112
6" Ductile	(4,700 ft, \$28/ft)	131,600
8 " PVC	(104,477 ft, \$28/ft)	2,925,356
8" Ductile	(3,235 ft, \$32/ft)	103,520
10" PVC	(3,168 ft, \$34/ft)	107,712
	Sub Total*	7,550,991
	Total (\$)	10,719,713

*Value has been increased by an additional 5% from the 2019 feasibility study

Update to Present Value of Water System

December 2021

Revised March 2022

Carteret County, NC

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Table 3. Estimated Water System Replacement Cost

System Item	Estimated Service Life (Years)	Description	Estimated Replacement Cost
SCADA System	20		\$150,000
Water Treatment Plants	50		\$2,000,000
Well House	50		\$350,000
Fire Hydrants	60	Approx. 100	\$500,000
Booster Pump Station 1	50		\$250,000
Booster Pump Station 2	50		\$300,000
Booster Pump Station 3	50		\$300,000
Water Tank 1	50		\$850,000
Water Tank 2	50		\$900,000
Water Tank 3	50		\$1,000,000
Piping System			
2" PVC	60	(26,400 ft, \$35/ft)	
4" PVC	60	(1,320 ft, \$45/ft)	
6" PVC	60	(151,588 ft, \$60/ft)	
6" Ductile	65	(4,700 ft, \$65/ft)	
8 " PVC	60	(104,477 ft, \$70/ft)	
8" Ductile	65	(3,235 ft, \$75/ft)	
10" PVC	60	(3,168 ft, \$80/ft)	
Piping Subtotal			18,193,635
		Total Estimated Replacement Cost	24,793,635

*Estimated costs based on known information of the water system

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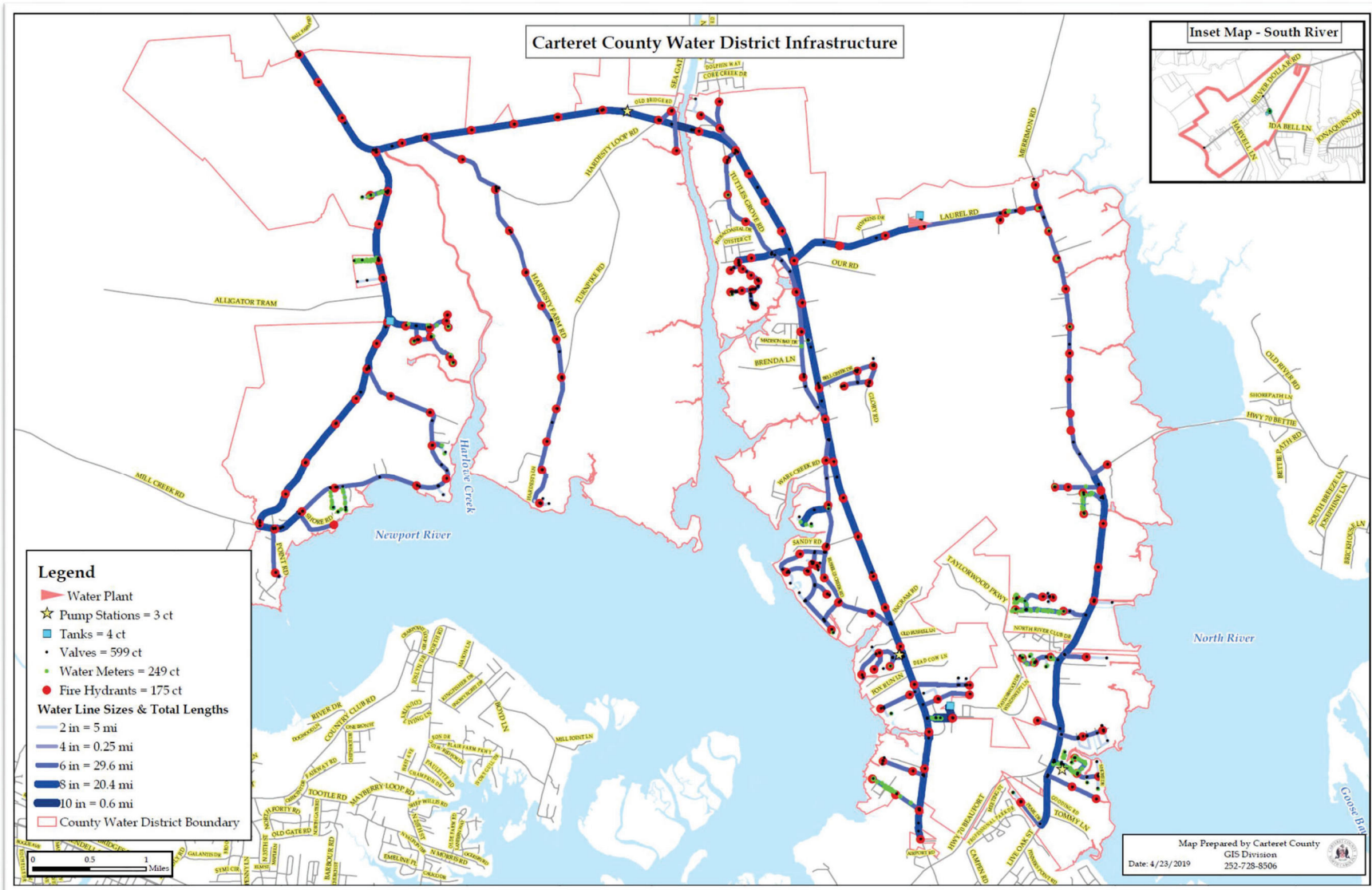


Figure 1 Carteret County Water System Map

FEASIBILITY STUDY FOR WATER SYSTEM MERGER

Carteret County, NC



December 2019


DAA Project Number: 18080125-010204




Draper Aden Associates
Engineering • Surveying • Environmental Services

3RD PARTY REVIEW

This Report has been subjected to technical and quality reviews by:

Andy Dastidar		12/5/2019
Name:	Signature	Date
Project Engineer		

Aziz Ahmed		12/5/2019
Name:	Signature	Date
Project Manager		

C. Tyrus Clayton, Jr		12/5/2019
Name:	Signature	Date
Quality Reviewer		

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APPENDICES

Appendix A	Carteret County Water System Maps
Appendix B	Carteret County Water Rates
Appendix C	Town of Beaufort Water Rates



EXECUTIVE SUMMARY

Carteret County (the County) retained Draper Aden Associates (DAA) to evaluate the feasibility of a "merger" of the County's water systems with Town of Beaufort's (the Town) water system. The proposed "merger" would entail the Town of Beaufort taking over the ownership and operation of the County's water systems.

The following tasks were performed:

1. Evaluated the County's water systems assets and maintenance programs.
2. Developed estimated present value of the County's water systems.
3. Reviewed current staffing and potential impacts on the Town's water system staffing, if the merger were to occur.
4. Reviewed the County's water rates, revenues, operating expenses and debt service.
5. Analyzed the projected fiscal impact on the Town of Beaufort water system, if the merger occurs.
6. Developed recommendations for a win-win merger condition for both the Town and the County.

Major findings from the study include:

1. County's water infrastructure is well documented and in good condition.
2. Estimated present value of the County's water system is approximately \$12.3 million.
3. County's current water rate (\$55.10 / 5,000 gallons) is less than the Town's out of town water rate (\$58.79 / 5,000 gallons).
4. County has outstanding water debt of \$2,066,128 (principal only) which will be retired in Fiscal Year 2051-2052.
5. The operating expenses of the County's water system have exceeded revenues in recent years and the deficits have been subsidized by the tax revenues generated from the Special Water Tax District. FY 2019 is the first year where projected expenses will be lower than the revenue. The County believes that FY 2019 will be the new normal as the water system is in good condition now, and the County does not have any need for large capital investment in the foreseeable future.
6. Currently, the County has three (3) water staff and the Town has four (4) water staff. The merged system will need services of a full-time and part time County staff in addition to the four (4) Town staff. There will be a \$165,000 savings in staff compensation. These excess funds can be used for system upgrades or capital expenditures.

DAA's findings show that a merger will be beneficial for both the County and the Town, but to make it workable for the Town, DAA made some recommendations.

**Recommendations:**

1. The County transfers the water systems to the Town at a cost of \$1.
2. The County continues to pay off the current debt service (\$245,800 / per year) for next 11 years to retire the debt earlier and remove or modify the water tax district after debt retirement.
3. Based on the current tax rate, the County will have excess fund (difference between water district tax revenue and debt service fee, \$177,000 per year) after merger until the debt is retired. County will work in good faith with the Town utilizing these funds for upgrades and expansions to the system during the 11-years debt pay-down period. County may also continue to participate in extensions and upgrades beyond the 11 years, for specific county needs within the existing water district boundaries.
4. The Town will maintain the water rates for the special water district at a rate that is less than the County water rates at the merger date and can increase or decrease the rates in future by the same percentage change as the in-Town water rates.

Benefits for the Town:

1. Acquisition of \$12.3 million worth of infrastructure without any financial investment.
2. Expansion of Town's water system and customer base.
3. County's financial support for at least 11 years to address special capital and maintenance issues in the system previously owned by the County.
4. Potential opportunity for annexation.

The advantages of this potential merger outweigh the few economic and financial limitations. Prior to merger of these water systems, the County and Town will need to address all legal and financial aspects of the merger, which will require good-faith negotiations from both entities.

-- End of Section --



1.0 INTRODUCTION

Carteret County and the Town of Beaufort are interested in “merging” the water systems of the two entities – with the Town taking over ownership and operation of the County’s water system.

1.1 Objectives

The objective of this feasibility study is to determine the value of Carteret County’s water systems, understand the staffing needs to operate and maintain the County’s systems, evaluate the financial condition of the County’s water department, identify the potential impact of the proposed merger on the utilities, and develop recommendations to make the merger beneficial for the Town and the County. The findings and recommendations are documented in this DRAFT report for further discussions with the County and the Town staff. This report will be updated based on the discussions between the County and the Town to be facilitated by DAA.

1.2 Report Organization

This report is organized as outlined below:

- ◆ Chapter 2.0 (Carteret County Water System Assessment) describes the County’s water system including land, physical assets, maintenance programs, and near-term capital improvement program.
- ◆ Chapter 3.0 (Estimated Current Value of Carteret County’s Water System) describes the monetary value of the assets and how the values were calculated.
- ◆ Chapter 4.0 (Organization of Carteret County Water Department) describes the current staffing structure and responsibilities.
- ◆ Chapter 5.0 (Revenues and Expenses of Carteret County Water System) describes the water rates, debt service and current financial conditions.
- ◆ Chapter 6.0 (Feasibility of Merger) describes the Town of Beaufort system, advantages to the Town in taking over the Carteret County System, and recommendations to make the merger beneficial to both the County and the Town.
- ◆ Chapter 7.0 (Conclusion) describes the outcome of this feasibility study.

-- End of Section --



2.0 CARTERET COUNTY WATER SYSTEM ASSESSMENT

2.1 System Overview

Carteret County (the County) relies on two groundwater wells for water supply. Water from the first well is treated at the Laurel Road Water Treatment Plant before it is pumped to three (3) elevated storage tanks for distribution within the community. These storage tanks are located with water lines extending to the Craven County line along NC Highway 101 and into the Mill Creek area. There are also water lines extending from the Beaufort Town limits along Highway 70 to East Carteret High School and along Merrimon Road to Laurel Road. The system serves approximately 1,206 customers.

The County also owns and operates a small water system about 20 miles north of Laurel Rd and Merrimon Rd intersection. This small system known as Merrimon Water System (MWS), serves approximately 25 – 30 customers. MWS receives water from the Jonaquins Creek well that consists of a well and an above-ground storage tank.

A map showing Carteret County's water system (including its water district boundary) is shown in Figure 1 of Appendix A. The MWS is shown at the inset of Figure 1 and in Figure 2 of Appendix A.

MWS system is an integral part of the County's water system and should be included in any potential water system merger or transfer discussions. Legalities of such a merger / transfer will be agreed upon and processed by participating agencies prior to acceptance and completion of the merger process.

2.2 Special Water Tax District

The Board of Commissioners of Carteret County established the Special Water Tax District (SWTD) in 2010. Within this district, there is a special tax assessed to taxpayers for water supply and distribution services. The tax rate in the special water district has been 5.5 cents since 2012. In addition, sales tax revenues in the SWTD are used to support the water operations. Table 1 provides the revenue and expenditures for the SWTD for FY2018, FY2019 and FY2020.

**Table 1. Revenue and Expenses for the Special Water Tax District**

	FY 2018 (Actual) \$	FY 2019 (Amended Budget) \$	FY2020 (Budget) \$
Expenditure Category			
Fees	1,240	3,000	3,000
Transfer to Water Fund	433,600	400,000	420,000
Total	434,840	403,000	423,000
Revenue Sources			
Ad Valorem Taxes	299,136	292,000	292,000
Sales Tax	96,329	95,000	100,000
Interest	1,505	1,000	6,000
Appropriated Fund Balances	0	15,000	25,000
Total	396,969	403,000	423,000

2.3 Water System Assets

The County water system assets include water mains, valves, water meters, fire hydrants, tanks, booster pump stations, a Supervisory Control and Data Acquisition (SCADA) system and land parcels. These assets are listed in Table 2.

Table 2. Water System Assets of Carteret County

Items	Quantity		Description
Water Plant	1		
Land	8 Parcels	16.49 acres	
Pump Stations/Pump Houses	3		Booster Pumps 1, 2, and 3
Water Tanks	4		3 elevated tanks and one ground tank
Valves	599		
Water Meters	1,206		
Fire Hydrants	175		
Water Lines	5 miles	2 inches	
	0.25 miles	4 inches	



Items	Quantity	Description
	29.6 miles	6 inches
	20.4 miles	8 inches
	0.6 miles	10 inches
SCADA System	1	Management of elevated water tanks and Jonaquins Creek well house

2.3.1 Storage Tanks

Details for the three elevated storage tanks are provided in Table 3.

Table 3. Elevated Water Tanks

Types of Tanks	Capacity (gallons)	Manufacturer	Design Type	Year Constructed
Taylor Farm Road Tank	200,000	Caldwell	Torus Bottom	2012
Laurel Road Tank	200,000	Phoenix	Double Ellipsoidal	1988
Mayflower Drive Tank	200,000	Phoenix	Torus Bottom	2012

2.3.2 Pump Stations

The County has three booster pump stations. Details of these pump stations are shown in Table 4.

Booster Pump 2 provides water at the emergency connection between the Town of Beaufort and the County.

Table 4. Pump Stations

Types of Pump	Cat No/Model Number	Manufacturer	Horsepower (HP)	Design Type (RPM)	Installation Date
Booster Pump #1	R5P 3D/H317	Emerson Motor Co.	5	1170	2012*
Booster Pump #2	EM3774T	Baldor Electric Co.	10	1760	2012
Booster Pump #3	EM3770T	Baldor Electric Co.	7.5	1770	2012

*Estimated, actual date of installation is not available.



2.3.3 Land

The total acreage utilized by the County's water system is approximately 16.49 acres. Table 5 summarizes the properties, the street address and the acreage.

Table 5. Carteret County Water System Property

Property	Address	Total Acres
Laurel Road Aerial Tank	524 Laurel Road	2.04
Laurel Road Treatment Plant	526 Laurel Road	8.12
Jonaquins Creek Water House	150 Jonaquins Creek Road	0.82
Taylor Farm Elevated Tank	209 Taylor Farm Road	1.01
Booster Pump Station #1	142 Shell Landing Road	0.47
Booster Pump Station #2	1109 Hwy 101	0.60
Booster Pump Station #3	3510 Hwy 101	2.56
Mayflower Drive Elevated Tank	104 Mayflower Drive	0.87
Total		16.49

2.4 Asset Maintenance

2.4.1 Pipeline Maintenance

The County's Public Works Department (PWD) performs system maintenance including, but limited to, the following:

- ◆ Detection and repair of leaks in the pipe lines
- ◆ Maintenance of booster pumps and other associated components of the water distribution system
- ◆ Maintenance and replacement of water meters, valves and fire hydrants
- ◆ Water service installations and / or inspections

2.4.2 Tank Maintenance

Southern Corrosion Inc (SCI) has an existing water tank management addendum to contract with the County until year 2030. Per contract, the tanks will be inspected every year and will be washed-out at five (5) year intervals. The tank interior will be recoated at fifteen (15) year intervals, and the exterior will be recoated at five (5) year intervals. The next wash-out is scheduled for year eight (8) of the service



(year 2023), repainting of the tank exterior is scheduled for year twelve (12) of the service (year 2027)
repainting of tank interior is scheduled for year twelve (12) of the service (2027).

The contract does not include the complete abrasive blasting of tank exterior nor the pressure washing of tank exterior as a stand-alone apart from a surface preparation for painting.

SCI provides the following services to the County in accordance with the tank's maintenance program:

- ◆ Emergency services (tank leaks, tank failures, etc.)
- ◆ Scheduled cleaning/washout of tanks interiors
- ◆ Inspection of interior and exterior surfaces of tanks
- ◆ Application of protective coatings
- ◆ Maintenance, upkeep and long-term maintenance needs

Table 6 below indicates the scheduled maintenance activities that have taken place under this contract for the last four years. Based on the 2018 inspection results as shown in Table 6, all three tanks are in good condition without any serious deficiencies that require immediate attention.

2.5 Carteret County Water System Capital Improvement Plan

In 2013, the County completed a \$3.51 million water system improvement project. Since 2013, there has been little need for significant capital projects; there were no capital projects scheduled in FY2019 and the FY2020 budget does not include any. The County continues to fund "pay as you go" capital projects, as needed. Recent capital investments include:

- ◆ Fiscal Year 2011: WTP Telemetry Base Upgrade, Addition of 10-inch Color MMI, Replace Tank Level Meter/Digital DSP-MMI, Use Existing Probe Relays-Raw Well Control, and Replace Remotes /Upgrade Phone Line and Radio. Total cost for upgrade was \$27,998.
- ◆ Fiscal Year 2016: BPS Flow Meter and RTU Repair. Total cost for repair was \$4,697.
- ◆ Fiscal Year 2017: Discharge Pump Station SCADA TIE-IN. Total cost for this implementation was \$3,309.
- ◆ Fiscal Year 2018: Softener and filter refurbishment. The total cost was \$121,446

Overall, the water system is in good condition and the County is not expecting any major capital investment in the near future.

**Table 6. Tank Maintenance Report (2015-2018)**

Tank	Year Constructed	Year-2015	Year-2016	Year-2017	Year-2018
Taylor Farm Road Tank	2012	The tank, its components, and coating systems are in good condition. The interior coating system deficiencies ranged between 0% and 10%, whereas, the exterior coating deficiencies ranged between 0%-2%. Some of the exterior deficiencies included; Pin Point Rust, and Irregular Surface Deterioration. No visual deficiencies were observed pertaining to internal coating system. The safety inspection yielded satisfactory and compliant results pertaining to structural integrity of exterior, storage, safety, and other associated components	The tank, its components, and coating systems are in good condition. The interior coating system is free of any premature failure and provides adequate protection to the structure. The upper portions of the leg ladder, sway rods, and shell wall ladder are showing signs of premature coating failure causing surface corrosion. Repair and scheduled maintenance maybe required	There was no maintenance required during this time. The coating in the exterior and interior are in excellent condition	No deficiencies or touchups were noted, and the overall visual appearance of the water tank is satisfactory
Laurel Road Tank	1988	The tank, its components, and coating systems are in good condition. The interior coating system deficiencies ranged between 0% and 10%, whereas, the exterior coating deficiencies ranged between 0%-2%. Some of the exterior deficiencies included; Irregular Surface Deterioration, Mildew, Peeling Multiple Coats, and Undercutting. Deficiencies pertaining to internal coating system included Pin Point Rust, and Irregular Surface	There were no deficiencies or touch ups noted and the overall visual appearance of the water tank (internal and external) is satisfactory. The obstruction light on tank roof was repaired	Both exterior and interior protective coating seems to be in excellent condition. The interior and exterior coating systems are free of any serious deficiencies and provides adequate protection to the structure.	The water tank, its components, and coating systems are in good condition. The interior and exterior coating systems are free of any serious deficiencies and provides adequate protection to the structure.



		Deterioration. The safety inspection yielded satisfactory and compliant results pertaining to structural integrity of exterior, safety, and other associated components. The side wall coating of the storage exterior needs to be monitored as per the report.		
Mayflower Drive Tank	2010	The tank, its components, and coating systems are in good condition. The interior coating system deficiencies ranged between 0% and 10%, whereas, the exterior coating deficiencies ranged between 0%-2%. Some of the exterior deficiencies included; Pin Point Rust, Irregular Surface Deterioration, etc. No visual deficiencies were observed pertaining to internal coating system. The safety inspection yielded satisfactory and compliant results pertaining to structural integrity of exterior, storage, safety, and other associated components	The tank, its components, and coating systems are in good condition. The interior coating system is free of any premature failure and provides adequate protection to the structure. On the exterior, such as the ladder and sway/spider rods, are showing signs of premature failure and surface corrosion. Repair and a scheduled maintenance may be required.	Exterior deficiencies included Mildew, Fading, Chalking, Irregular Surface Deterioration, Undercutting, Peeling Paint to Substrate. Adhesion failures and surface corrosion present on 20% of the surfaces. 10% Adhesion failures and surface corrosion observed on the rods and struts. And close to 2% adhesion failure and surface corrosion observed on the catwalk and handrails. The interior protective coating system seems to be in excellent condition
		Structural wise, the tank is in good condition, but a planned renovation needs to be scheduled by the County Officials. A weathered and weakened coating system is nearing the end of its protective cycle		

-- End of Section --



3.0 ESTIMATED CURRENT VALUE OF THE CARTERET COUNTY WATER SYSTEM

3.1 Theory of Asset Valuation

DAA estimated the value of the County's water system using an asset evaluation approach as described below.

Book Value (BV) approach was used in estimating the value of the fixed assets. The BV approach uses equation (1) to estimate the present worth of an asset as stated below:

$$\text{Present BV of Asset (\$)} = \text{Historical Cost (\$)} - ((\text{Accumulated Depreciation (\$)} + \text{Current Depreciation (\$)}) \quad (1)$$

Traditionally, straight line depreciation (SLD) technique is used to estimate depreciated value of water system assets. Historical cost represents the cost of the assets on the day of acquisition. DAA was able to locate financial records pertaining to purchase prices on some of these assets from the County's finance department.

Accumulated depreciation is calculated using equation (2), and incorporates useful life of the water distribution system component:

$$\text{Accumulated depreciation (\$)} = (\text{Net Amount to be depreciated} / \text{Total useful life in months}) \times ((\text{Fiscal year beginning date} - \text{date of acquisition}) / 30.4167) \quad (2)$$

The value of 30.4167 is used for converting days to months.

Depreciation value (\$) for each asset for the current year is estimated using the following equation:

$$\text{Current Depreciation (\$)} = \text{Net amount to be depreciated (\$)} / \text{Total useful life (months)} \quad (3)$$

The equation (3) may be modified if the depreciation amount (\$) in equation (3) exceeds the difference of net amount to be depreciated and accumulated depreciation. The revised equation for Current Depreciation is stated below:

$$\text{Depreciation Current Year (\$)} = \text{Net Amount to be depreciated (\$)} - \text{Accumulated depreciation (\$)} \quad (4)$$



The Net amount to be depreciated (\$) is calculated using the equation (5)

$$\text{Net Amount to be depreciated (\$)} = \text{Historical Cost (\$)} - \text{Salvage Value (\$)} \quad (5)$$

For purpose of estimation, the salvage value of each system component was assumed at zero dollar (\$0). With this assumption, the net amount to be depreciated was equaled to the historical cost of the asset.

3.2 Estimated Value of the County's Water Systems

The County provided detailed asset data and historical costs for the pump stations and the water tanks. Book Value (BV) of these assets was calculated and is documented in Table 7. Historical cost data for other assets such as fire hydrants, the water treatment plant, water mains, and the SCADA system installed at Booster Pump 1 were not available, but the County provided financial data that detailed the present book value of the assets as listed in Table 8. Adding the total book values listed in the Tables 7 and 8, the net worth of the water system assets owned by the County was calculated to be approximately \$12,335,392.

*Feasibility Study for
Water System Merger*OFFICIAL COPY
Jul 26 2022**Table 7. Estimated Book Value of Carteret County Water System**

Assets	Date of Acquisition	Design Life (yrs)	Historical Cost (\$)	Total Useful life (months)	Net Amount to Be Depreciated (\$)	Accumulated Depreciation (\$)	Current Depreciation (\$)	Total Depreciation (\$)	Present Book value of Asset (\$)
Booster Pump 1	2012	50	174,284	600	174,284	19,462	3,486	22,947	151,337
Booster Pump 2	2012	50	253,111	600	253,111	28,264	5,062	33,326	219,785
Booster Pump 3	2012	50	<u>253,111</u>	600	253,111	28,264	5,062	<u>33,326</u>	<u>219,785</u>
Subtotal			680,507				Subtotal	89,600	590,907
Water Tank 1	1988	50	619,263	600	619,263	366,397	12,385	378,783	240,480
Water Tank 2	2012	50	689,091	600	689,091	76,949	13,782	90,730	598,361
Water Tank 3	2012	50	<u>765,262</u>	600	765,262	85,454	15,305	<u>100,759</u>	<u>664,502</u>
Subtotal			2,073,616				Subtotal	570,272	1,503,344
Total			2,754,123				Total	659,872	2,094,250

See Section 3.1 for the equations used in BV calculations

**Table 8. Present Book Value of Carteret County Water System**

System No	Description	Present Book value of Asset (\$)
SCADA		
Booster Pump House1	SCADA System*	280,000
Land		
Laurel Road Aerial Tank	Land Property	25,428
Laurel Road Treatment Plant	Land Property	57,220
Jonaquins Creek Water House	Land Property	26,097
Aerial Tank	Land Property	130,312
Booster Pump Station-1	Land Property	40,578
Booster Pump Station-2	Land Property	35,312
Booster Pump Station-3	Land Property	34,160
Elevated Tank	Land Property	20,615
	Sub Total	369,722
Well House	Water withdrawal house*	200,000
Jonaquins Creek Well House and Storage	Merrimon Water System*	400,000
Fire Hydrants	Fire rescue purposes	300,000
Water Treatment Plants	Supply/Distribution*	1,500,000
Piping System		
2" PVC	(26,400 ft, \$10/ft)	264,000
4" PVC	(1,320 ft, \$16/ft)	21,120
6" PVC	(151,588 ft, \$24/ft)	3,638,112
6" Ductile	(4,700 ft, \$28/ft)	131,600
8 " PVC	(104,477 ft, \$28/ft)	2,925,356
8" Ductile	(3,235 ft, \$32/ft)	103,520
10" PVC	(3,168 ft, \$34/ft)	107,712
	Sub Total	7,191,420
	Total (\$)	10,241,142

*Estimated value

--End of Section --



4.0 ORGANIZATION OF CARTERET COUNTY WATER DEPARTMENT

The County's water system is managed by the Public Works Department (PWD) Director. Water operations are managed by a lead water plant operator and utilities technician who report to the PWD Director. The PWD Directors reports to General Service Director who in turn is managed by the Assistant Manager of the County. The Assistant Manager reports to the County Manager. Billing and collection responsibilities for the systems are provided by the County Finance Office. An organizational chart for the Water Department is shown in Figure 1.

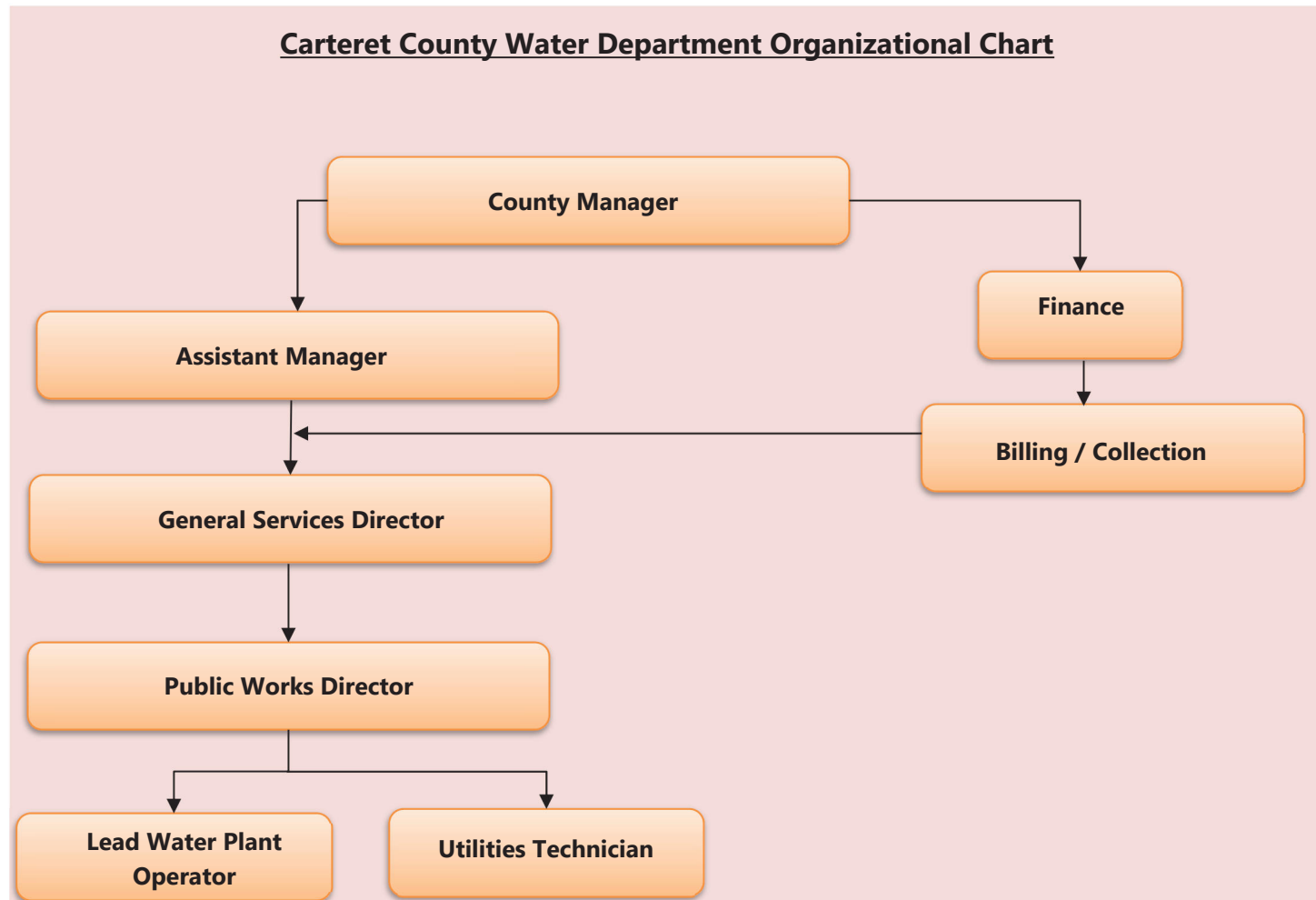


Figure 1. Carteret County Organizational Chart



5.0 REVENUES AND EXPENSES OF CARTERET COUNTY WATER SYSTEM

5.1 Water Rates

Currently, the County charges \$55.10 for every 5,000 gallons of water to customers who are billed per measurements recorded on a three-fourth (3/4) inch meter (See the County's Water Rate Sheet in Appendix B). There is a separate water rate structure for customers served by 1, 2, and 4-inch meters. The County has also developed a specific readiness to serve rate for the Merrimon water system customers. For this study, only three-fourth (3/4) inch meter is used to conduct comparative analysis of the water rates for both the County and the Town system.

The Town charges \$35.72 for every 5,000 gallons to in-town customers using three fourth (3/4) inch meters (See the Town's Water Rate Schedule in Appendix C). The comparative out-of-town water rate is \$58.79.

5.2 Outstanding Debts and Repayment Schedule

Current utility debt for the County is at \$2,066,128 with an estimated interest of \$619,319 until the loan amount is retired by the year 2052. Table 9 and Figure 2 below show the debt payment schedule for each year. The debt payment amount for each year will significantly lower after FY 2025-26 and the debt amount per year will remain relatively constant until the loans are completely retired.

Table 9. Water Utility Debt Payment Schedule for Carteret County

FY Year	Principal (\$)	Interest (\$)	Total Utility Debt (\$)	Years
FY 19-20	\$189,032	\$55,202	\$244,234	1
FY 20-21	\$190,032	\$49,835	\$239,867	2
FY 21-22	\$190,032	\$44,442	\$234,474	3
FY 22-23	\$191,032	\$39,047	\$230,079	4
FY 23-24	\$160,000	\$33,626	\$193,626	5
FY 24-25	\$161,000	\$29,989	\$190,989	6
FY 25-26	\$161,000	\$26,322	\$187,322	7
FY 26-27	\$22,000	\$22,660	\$44,660	8
FY 27-28	\$23,000	\$22,055	\$45,055	9
FY 28-29	\$23,000	\$21,423	\$44,423	10



*Feasibility Study for
Water System Merger*

FY Year	Principal (\$)	Interest (\$)	Total Utility Debt (\$)	Years
FY 29-30	\$24,000	\$20,790	\$44,790	11
FY 30-31	\$25,000	\$20,130	\$45,130	12
FY 31-32	\$25,000	\$19,443	\$44,443	13
FY 32-33	\$26,000	\$18,755	\$44,755	14
FY 33-34	\$27,000	\$18,040	\$45,040	15
FY 34-35	\$27,000	\$17,298	\$44,298	16
FY 35-36	\$28,000	\$16,555	\$44,555	17
FY 36-37	\$29,000	\$15,785	\$44,785	18
FY 37-38	\$30,000	\$14,988	\$44,988	19
FY 38-39	\$31,000	\$14,163	\$45,163	20
FY 39-40	\$31,000	\$13,310	\$44,310	21
FY 40-41	\$32,000	\$12,458	\$44,458	22
FY 41-42	\$33,000	\$11,578	\$44,578	23
FY 42-43	\$34,000	\$10,670	\$44,670	24
FY 43-44	\$35,000	\$9,735	\$44,735	25
FY 44-45	\$36,000	\$8,773	\$44,773	26
FY 45-46	\$37,000	\$7,783	\$44,783	27
FY 46-47	\$38,000	\$6,765	\$44,765	28
FY 47-48	\$39,000	\$5,720	\$44,720	29
FY 48-49	\$40,000	\$4,648	\$44,648	30
FY 49-50	\$42,000	\$3,548	\$45,548	31
FY 50-51	\$43,000	\$2,393	\$45,393	32
FY 51-52	\$44,000	\$1,210	\$45,210	33
Total	\$2,066,128	\$619,139	\$2,685,267	

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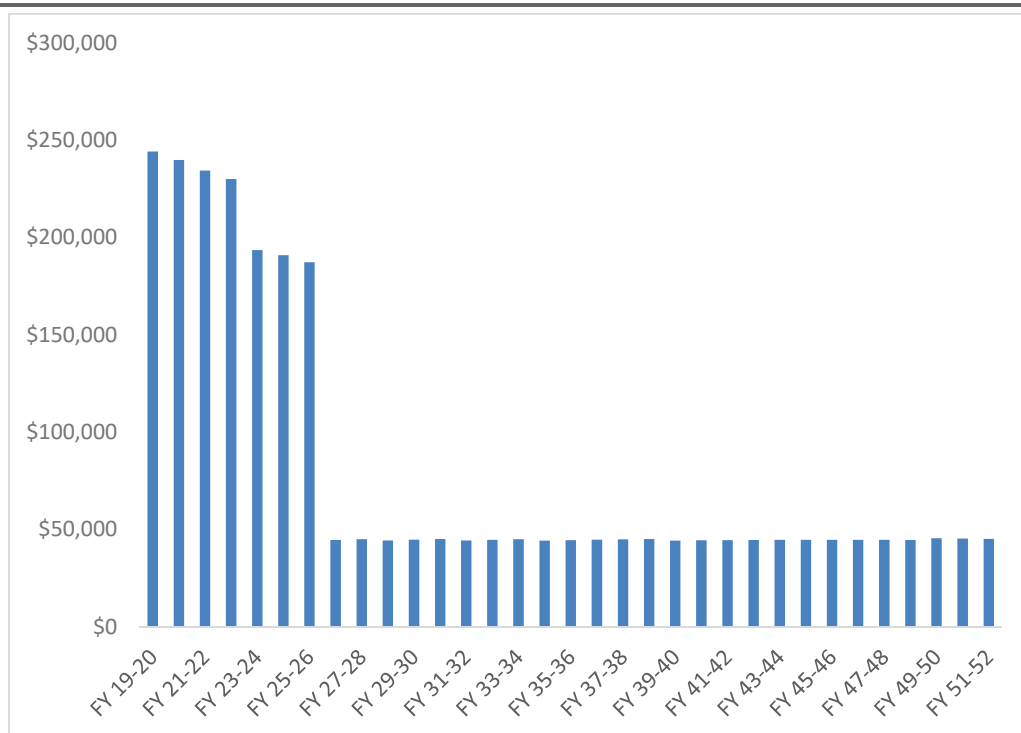


Figure 2. Carteret County Water Utility Debt Payment Schedule

5.3 Revenue and Expenses

5.3.1 Review of Historical Revenue and Expenses

A review of the County's historical water system budget (including the debt services) between FY 2016 and FY 2019 listed in Table 10 shows significant water system operating expenses beyond the revenue earned. This data indicates that the County has been losing money with the water system and needed to subsidize the system with the SWTD funds to keep the system solvent. The deficit margin widened in 2018 considering the additional capital improvement expense for that year. However, for 2019, there was a marginal decline in the water system operating expense which lead to the deficit being similar to that of 2016 and 2017 respectively.

**Table 10. Budget for F2016-FY2019**

Year	Water System Revenue	Water System Operating Expense	Water System Debt Service Fee	Water System Capital Outlay	Net Income (Deficit)
2016	\$576,598	\$554,733	\$263,589	-	(\$241,724)
2017	\$584,344	\$668,215	\$259,277	-	(\$343,148)
2018	\$678,879	\$828,412	\$253,939	\$37,898	(\$441,370)
2019	\$711,732	\$726,384	\$249,600	\$25,500	(\$289,752)
Total	\$2,551,553.00	\$2,777,744.00	\$1,026,405.00	\$63,398.00	(\$1,315,994)

5.3.2 Review of FY 2020 Finances

The projected fiscal budget for the County in the year 2020 is presented in Table 11. Per projected water fund revenue and water fund expenses for FY 2020, there is a net fiscal deficit of \$162,990. This deficit may be eliminated by using revenue generated from the SWTD. Using this fund to eliminate the deficit leaves a net balance of \$14,130 that may be used for other operational expenses.

Table 11. Projected Fiscal Budget for year 2020

Items Description	Budget
Water Distribution System Value ¹	\$12,335,392
Total Utility Debt (including interests) ²	\$2,685,267
Debt Pay Off Period	2051-2052
FY 2020 Debt Service Fee ³	\$245,880
Water Tax District Revenue (FY 2020 Projected) ⁴	\$423,000
Water Fund Revenue (FY 2020 Budget) ⁴	\$710,400
Water Fund Expense (FY 2020 Budget) ⁴	\$873,390
Water Fund Loss ⁵	(\$162,990)
Water Tax District Revenue Balance ⁶	\$14,130

Notes:

1. See Section 3.2 for reference
2. See Table 9 for reference
3. See Tables 9 for reference. The difference between the monetary value of \$245,880 in Table 11 compared to the fiscal value of \$244,234 in Table 9 for FY2020 may due to budgetary discretion
4. Projected FY 2020 Budget
5. Water Fund Loss/Deficit is estimated using the equation: Water Fund Revenue (\$710,400) - Water Fund Expense (\$873,390)
6. Water Tax District Revenue Balance is estimated using the equation: Water Tax District Revenue – (FY20 Debt Service Fee + Water Fund Loss)



5.4 Opportunity to Eliminate Deficit

The expense in 2019 shows significant reduction over the previous years and is expected to be the norm as the County's system does not anticipate significant capital investment in near future.

A moderate projection of 2% yearly increase in both water district tax revenue and water system expense may be adequate to run the system sustainably. Table 12 lists the yearly revenue and expenses from 2020 to 2025 using 2019 as the base year for projection. This projection shows a positive yearly cash flow. Thus, if the water system in its current condition (with a value of \$12.3 million) can be separated from the debt services, it would offer an attractive acquisition option for any utility.

Table 12. Fiscal and Projected Budget for FY 2019-FY 2025

Year	Water Tax District Revenue	Water System Expense	Cash Flow
2019	\$711,555	\$704,255	\$7,300
2020	\$725,786	\$718,340	\$7,446
2021	\$740,302	\$732,707	\$7,595
2022	\$755,108	\$747,361	\$7,747
2023	\$770,210	\$762,308	\$7,902
2024	\$785,614	\$777,554	\$8,060
2025	\$801,327	\$793,106	\$8,221

-- End of Section --



6.0 FEASIBILITY OF MERGER

6.1 Water System of Town of Beaufort

The Town of Beaufort provides water and sewer services to its residents through established water rates that covers existing financial debts and other operational costs pertaining to these enterprise funds. The Town purchases water from the County for distribution in Eastman Creek subdivision. Currently the Town provides limited sewer service to approximately 200 customers located within County's SWTD with water purchased from the District at its existing rate. The Town has sewer force mains along NC Highway 70 serving sewer needs to East Carteret High School, also extending along NC Highway 101 serving sewer needs to Eastman's Creek and Jarrets Bay Industrial Park. This existing layout of the sewer force mains provides an opportunity to serve sewer needs within a large area of the County's SWTD which could offer an attractive condition to grow the customer base for the Town's sewer system.

Current water and sewer rate for an out-of- town customer is approximately double the rate of in-town customer. Acquiring the County's water system would increase the Town's customer base by approximately 34% with no cost for infrastructure. The potential opportunity to grow both water and sewer services within the County, at a lower rate will encourage businesses and developers to seriously consider annexation when planning growth within the merged service area.

6.2 Organizational Impact of Merger

Currently, the County's PWD has three personnel who are directly responsible for water operations. The organizational responsibilities of these people have been described in Chapter 3. If a merger is executed, one and possibly two of these employees could be transferred to Town's Public Utilities Department, which now has a total of four (4) full time employees. For the purpose of this report we will calculate the Town's additional personnel needs to support the merger at service provided by a full-time and a part-time employees. The County would transfer the remaining employee to another area of need with their other operations. Based on 2020 budget, salaries for the County's 3 water staff are approximately \$330,000, including benefits. The merger could provide an opportunity to save a



minimum of half (\$165,000) that expense. With other redundancies within the budgets, this number could very well be higher.

Water billing, collection and customer service support would be completely transferred from the County to the Town. As the Town is already managing its own billing, it is assumed that no additional employee is needed for billing the merged system.

6.3 Key Advantages of Merger for Town of Beaufort

There are several advantages for the Town to acquire the County's water distribution system. Some of the key benefits are listed below:

- ◆ The Town will acquire approximately \$12.3 million worth of infrastructure from the County.
- ◆ The Town will be able to operate the system largely with existing personnel plus 1.5 additional staff and equipment.
- ◆ The merged water systems would provide an opportunity not only for system growth but could also spur business and residential growth in the Town's tax base through potential annexations.
- ◆ With the merger, a new rate structure may be proposed to attract developers and business that are near the existing sewer force mains to consider annexation to avoid out-of-town rates.

6.4 Recommendation for Carteret County

As shown in Table 9, the water district system has an existing debt of \$2,066,128 (principal only) that will be fully retired by the year 2052. This debt poses a liability and concern for the Town if they acquire the County's water distribution system. For a successful merger of the two water distribution systems, the following are recommended measures for the County:

- ◆ The County would maintain the SWTD for a minimum of eleven (11) years until FY 2031. The debt service for FY 2020 is \$245,800 (adopted by the County Commissioner) which will be paid using the revenue generated from special water district funds. The County should pay this same debt service fee amount for the next eleven (11) years to retire the debt. Once this existing debt is retired, the County may no longer need to maintain this special water tax district and can either eliminate the tax altogether or modify it for future needs within the district for health and safety.
- ◆ If the County transfers ownership of its water systems to the Town and agrees to continue pay \$245,880 per fiscal year toward the debt, there will be a net balance of \$177,120 (Table 11; \$423,000-\$245,880) every year, in the special water district funds. The County may use



these remaining funds to participate in capital improvement upgrades and replacements of the existing infrastructure transferred to the Town. However, capital improvements directly benefiting the Town would be subject to negotiation.

- ◆ The County would maintain the right to request upgrades to the existing system within the SWTD boundaries with mutual understanding that the cost for such an upgrade will be paid by the County for a negotiated number of years. A potential negotiated period may include the next 11 years when the County would continue to collect the SWTD revenue to pay off the debt service. It is also expected that both the Town and the County will work together to accomplish these projects through a fair assessment of capital project benefits to each entity.

6.5 Recommendation for Rate Modification

Existing out-of-town rates (Appendix C) established by the Town are currently seven percent (7%) higher than rates charged by the County (Appendix B). In exchange for the County's commitment to transfer ownership of the system, participate in capital costs for a period of eleven (11) years and retire the existing debt, it is recommended that the Town adopts a readiness to serve charge for the SWTD that is the same as that for the out of town customers but keep the water use rate as that of in town customers, shown in Table 13.

Table 13. Proposed Out of Town Water Rates

Description	Amount (\$)
Readiness to Serve Charge ¹	\$20.74
Variable Rate for Water ²	\$5.07/1,000 gallons
Cost for 5,000 gallons ³	\$46.09

Notes:

1. Out of Town Readiness to Serve
2. Water Usage rate for in Town customers (Appendix c)
3. Cost = \$20.74 + (\$5.07*5) = \$46.09

This rate is a recommendation only that still keeps the water rate for the current County customers below their present water rate. For this report, only the rate for 3/4 inch meters was considered; the rates for other size meters serving customers within the water district boundary can be set using similar logic.



Accepting this water rate structure in addition to acquiring the County water system infrastructure, would not limit the Town's right to maintain another out-of-town rate for customers outside the County's current water district boundary.

6.6 Financial Advantages for Town

The proposed rate structure (for 3/4-inch meters) shown in Table 13 would save County customers an estimated \$9.01 per month compared to the existing county water rate of \$55.10 per month. Though the new rate structure would reduce water sales revenues generated from the County customers, the savings in operating expense through reductions in salaries (1.5 persons instead of 3 persons) and other redundant expenses needed for operation would more than compensate for any losses. As described in Section 6.2, the merger would save nearly \$165,000 per year in salaries and benefits. Considering that saving, water system revenues and expenses for before and after merger conditions are calculated and shown in Table 14.

Table 14. Comparison of Cash Flow - Before and After Merger

Year	Projected Special Water District Revenue (Before Merger) ¹	Projected Special Water District Revenue (After Merger) ²	Projected Water System Expense (Before Merger) ¹	Water System Expense (After Merger) ³
2020	\$725,786	\$606,757	\$718,340	\$553,340
2021	\$740,302	\$618,892	\$732,707	\$567,707
2022	\$755,108	\$631,270	\$747,361	\$582,361
2023	\$770,210	\$643,896	\$762,308	\$597,308
2024	\$785,614	\$656,773	\$777,554	\$612,554
2025	\$801,327	\$669,909	\$793,106	\$628,106
Total	\$4,578,346.51	\$3,871,471	\$3,827,121	\$3,3541,376

Notes:

1. From Table 12
2. 83.6% of Revenue (Before Merger); 83.6% is based on Current County rate of \$55.1 and proposed rate of \$46.09 as calculated in Table 13
3. Expense (Before Merger) minus savings in staff compensation (\$165,000)

Projected after-merger revenue and expense show positive cash flow for the County system that would be acquired by the Town. The higher out-of-town rate for the acquired system would encourage



customers and developers to strongly consider the option of annexation. The annexation would lead to lowering of utility rates and eventually increase tax base for the Town.

-- End of Section --

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7.0 CONCLUSION

The merger of the two water systems will be beneficial for both the County and the Town. Acceptance of merger conditions would benefit the Town from acquiring \$12.3 million of water system assets. This would also lead to expansion of their customer base without the expenditure of major funds for years to come.

Acquiring the County's water system would require periodic upgrades and capital improvement investments, however, the capital associated with such an upgrade is not a concern due to the following reasons:

- ◆ Potential for growth in utility revenues and tax base.
- ◆ Recommended agreement for County participation in costs for a period of a minimum of eleven (11) years after transfer of the water distribution system for capital improvements to the existing system.
- ◆ County participation toward "county specific" upgrades and extensions within the district.

Considering the advantages and disadvantages of this potential merger, DAA recommends transfer of the County's water distribution system to the Town, for the sum of one dollar and other valuable considerations. The acceptance of the merger conditions by the Town will be based on refinement of these conditions and other concessions by both parties. All legal issues regarding such transfer will need to be addressed before the merger of the two water systems can be completed and executed.

-- End of Section --



8.0 REFERENCES

Blank Depreciation Worksheet Developed for City of Dogwood Depreciation Calculation Worksheet-Government Capital Assets.

Laurel Park / Hendersonville Water System Merger Feasibility Study, Town of Laurel Park, North Carolina, June 2017.

Jordan Lake Water Supply Storage Allocation Request, City of Raleigh and Merger Partners, January 13, 2015.

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Appendix A

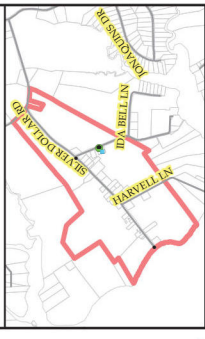
Carteret County Water System Maps

Figure 1

Carteret County's Water System

Carteret County Water District Infrastructure

Inset Map - South River



Legend

- Water Plant
- Pump Stations = 3 ct
- Tanks = 4 ct
- Valves = 599 ct
- Water Meters = 249 ct
- Fire Hydrants = 175 ct

Water Line Sizes & Total Lengths

- 2 in = 5 mi
- 4 in = 0.25 mi
- 6 in = 29.6 mi
- 8 in = 20.4 mi
- 10 in = 0.6 mi

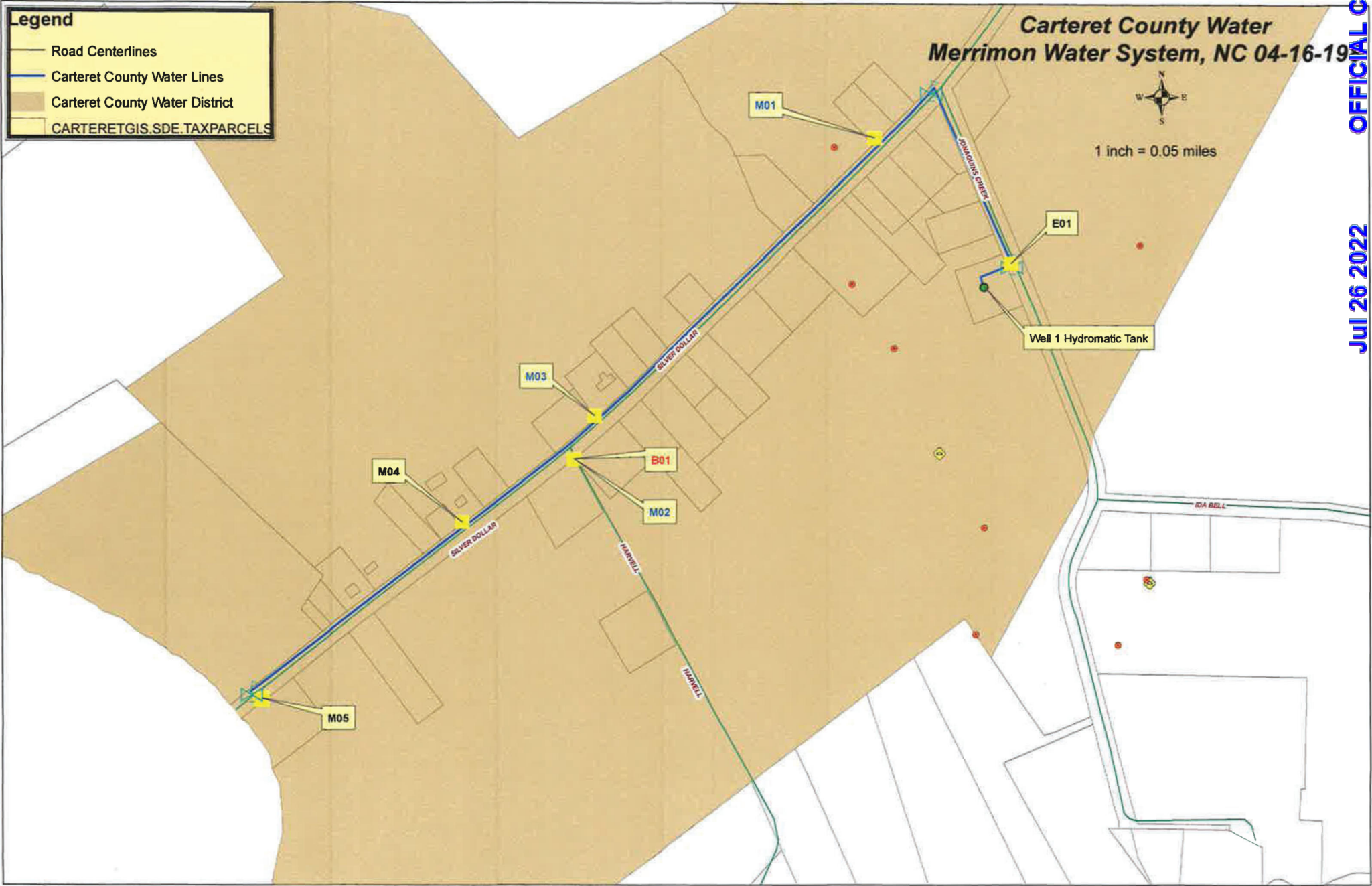
County Water District Boundary

Scale: 0.5, 1 Miles

Map Prepared by Carteret County
GIS Division
Date: 4/23/2019
252-78-8506

Figure 2

Merrimon Water System



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Appendix B

Carteret County Water Rates

**Water Service
Fee Schedule
FY 2018-2019****3/4" Meter**

Basic Charge (No Usage) Flat Fee	\$27.50 / mo. Covers 1 st 1,000 gals.
Volume Charge	\$6.90 per 1,000 gals

1" Meter

Basic Charge (No Usage) Flat Fee	\$38.00 / mo. Covers 1 st 1,000 gals.
Volume Charge	\$6.90 per. 1,000 gals

2" Meter

Basic Charge (No Usage) Flat Fee	\$110.00 / mo. Covers 1 st 15,000 gals.
Volume Charge	\$6.90 per 1,000 gals

4" Meter

Basic Charge (No Usage) Flat Fee	\$340.00 / mo. Covers 1 st 53,000 gals.
Volume Charge	\$6.90 per 1,000 gals

Merrimon System (3/4" Meter)

Basic Charge (No Usage) Flat Fee	\$16.00 / mo. Covers 1 st 1,000 gals.
Volume Charge	\$6.90 per 1,000 gals

Town of Beaufort (Eastman's Creek)

Basic Charge (No Usage) Flat Fee	\$27.50 / mo. Covers 1 st 1,000 gals.
Volume Charge	\$6.90 per 1,000 gals

Fire Hydrant Usage**Hookup & Service Charge:**

\$75.00/Monthly

Mobilization to hydrant site and employee on site during tank fill.

\$200.00 Deposit

\$8.75 per 1,000 gallons.

Hydrant & Hydrant Meter Tampering\$250.00 1st offense\$500.00 2nd offense (and Legal Action)**Damage Fee – Fire Hydrant**

\$2,500.00

Fire Line – Sprinkler Fee

Size	Monthly fee
2"	\$27.50
4"	\$32.50
6"	\$75.00
8"	\$105.00

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Tap Fees

Meter Size	Tap Fee**
3/4 "	\$1,000.00
1"	\$1,150.00
2"	Cost + 10%
4"	Cost + 10 %

****Additional \$900.00 Tap Fee for any meter requiring road bore work**

Any meter 2 inch or larger will be engineered by Mc David & Associates and County will charge cost of materials and installation, engineering fees and additional 10%.

Security Deposits

Property Owner	\$100.00
Renter/Lease holder	\$200.00

Damage and Tampering Fees

Tampering Fee - Meters	\$100.00
2nd Offense (and Legal Action)	\$500.00
Damage Fee – Meters	\$135.00
Damage Fee – MXU Remote Unit	\$135.00

Other Fees

Non-Sufficient Check Fee	\$25.00
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Bank Inspections	\$30.00
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Late Charges	10% of balance
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Service Fee*	\$30.00
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*At the time of reconnection the deposit on account must be equal to the deposit amount required for new accounts as of that date.

*All accounts subject to disconnection that have not been paid by 5:00 pm on the day prior to disconnections will be charged the service fee.



Appendix C

Town of Beaufort Water Rates

Fee Schedule

Water & Sewer Rates & Fees

All water and sewer taps made outside Town limits are double in-town rates shown above. Water or sewer capacity fees outside Town limits are negotiable but will not exceed 2X rates shown above.

Upgrades in service, i.e., changing from a 3/4" meter to a 1" meter, are subject to a difference in the water tap, water capacity, and sewer capacity fees.

All taps larger than 2" shall be installed at developer's cost in accordance with Town of Beaufort standards and developers shall pay a tap-on fee as shown above.

► Tap & System Development Fees

TAP FEES			SYSTEM DEVELOPMENT FEES		
<u>SIZE</u>	<u>WATER</u>	<u>SEWER</u>	<u>SIZE</u>	<u>WATER</u>	<u>SEWER</u>
¾"	\$ 700	\$ 750	¾"	\$ 476	\$ 5,524
1"	800	750	1"	793	6,207
1 ½"	1,075	750	1 ½"	1,585	7,015
2"	1,375	750	2"	2,536	8,064
3"	575	750	3"	4,755	10,445
4"	625	750	4"	7,925	15,875
6"	850	750	6"	15,850	22,550
8"	1,175	750	8"	25,360	26,240

FY 2020 Budget

► **Water & Sewer Usage Rates****WATER USAGE RATES**

<u>TYPE</u>	<u>SIZE</u>	<u>IN TOWN</u>	<u>OUTSIDE</u>
BASE	¾"	\$ 10.37	\$ 20.74
	1"	17.32	37.33
	1 ½"	34.53	82.96
	2"	55.27	147.25
	3"	110.65	333.91
	4"	172.87	NA
	6"	345.63	1,327.36
VARIABLE	1000 gal	5.07	7.61

SEWER USAGE RATES

<u>TYPE</u>	<u>SIZE</u>	<u>IN TOWN</u>	<u>OUTSIDE</u>
BASE	¾"	\$ 21.17	\$ 42.34
	1"	35.85	70.01
	1 ½"	70.50	140.99
	2"	112.20	225.67
	3"	225.88	451.77
	4"	352.90	705.81
	6"	705.60	1,411.19
VARIABLE	1000 gal	16.80	33.60

Fee Schedule

► **Water & Sewer Service Charges****WATER & SEWER SERVICE CHARGES**

New Account Service Fee	\$20	Waived with bank draft
Application Fee	5	
<i>SECURITY DEPOSITS</i>		
3/4" meter	\$75-225, based on credit score	
1" meter	100	
1 1/2" meter	140	
2" meter	275	
Transfer Account	25	
Returned Check Fee	25	
Late Fees	10% added to late portion	
Reconnect Fee - Business Hours	25	
Reconnect Fee - After Hours	75	
After Hours Service Calls	75	
Temporary Connection (for cleaning, renovation inspection, etc.)	25	available for a 2-week period, plus water and sewer usage charges
Fire Hydrant Meters	75	mobilization, on site-employee, and 5,000 gal of water; additional \$.01/gal
Irrigation/Dock Meter	700	tap fee
Meter-Only Install	400	no new tap fee
Meter Testing	30	
Meter Tampering	100	

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THANK YOU!



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