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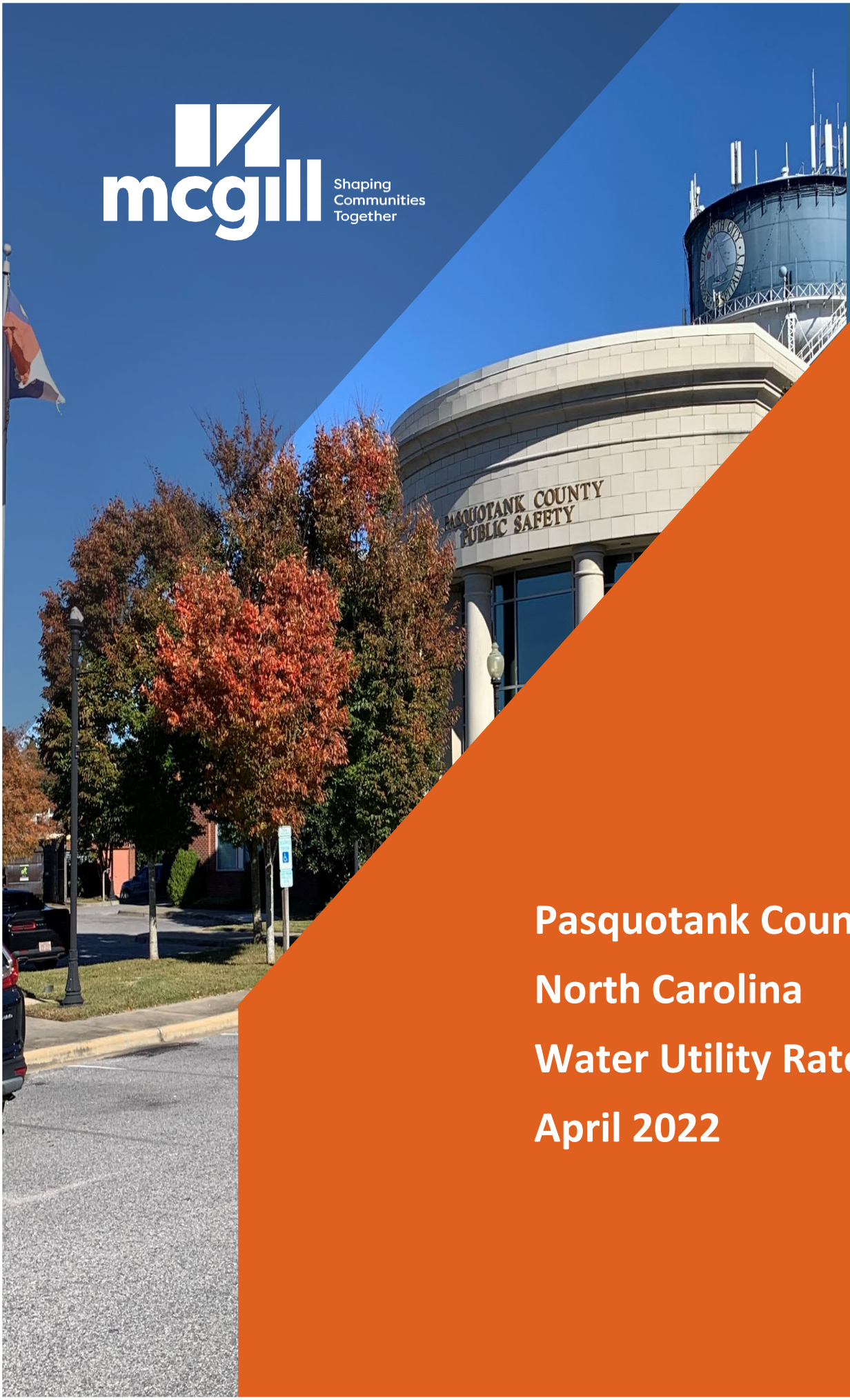



# Pasquotank County
# North Carolina
# Water Utility Rate Study
# April 2022

## TABLE OF CONTENTS

# Pasquotank County, North Carolina Water Utility Rate Study

**Summary Report: Rate Study Results and Recommendations**

**April 2022**

## Executive Summary

McGill Associates (McGill) is providing the following report as a summary of findings for the Water Utility Rate Study to include the revenue needs of the water utility over the 10-year planning period, cost of service analysis and recommended rate structures that provide full cost recovery. A financial model specific to Pasquotank County using historical information was used to establish trends and known inputs from the Utilities Staff to reasonably project revenues and expenses is the basis of this report.

Approach and Methodology

The Capital Improvements Plan (CIP) is a critical component used in the model, which is based on the capital needs identified in the Comprehensive Evaluation and Master Plan 2020-2040 conducted by Green Engineering and updates provided by the County's Utilities Director. Significant capital needs are programmed into the first 4 years of the schedule that include the Newland pump station, upgrades to both water treatment plants and rehabilitation work on the Weeksville Road well field. The first 5-years of the CIP account for $24.5 million, approximately 72% of the total $34 million 10-year CIP. Years 6 through 10 of the CIP totals $9.5 million or 28% of the 10-year program.

The revenue requirements analysis assumes a modest growth rate of new customers based on historical revenue data. An additional 1,100 customers from the South Mills acquisition are programmed in FY23. The resulting incremental water production costs and one (1) additional worker are needed to maintain this new service area and are included in the analysis.

Using these inputs, additional revenue is necessary to fund ongoing O&M and capital investment over the 10-year planning period. Total new revenue over the 10-year planning period, through rate increases, is approximately 4.5% per year of the current rates using the most common implementation strategy. This compares favorably to the average annual rate increase of 5.1% for public water systems in North Carolina published in the UNC Environmental Finance Center's 2021 Rates Report.

The cost-of-service analysis quantified fixed and variable cost baselines were used to identify general cost allocations to be applied to the customer base. Results of the analysis were reviewed with the Utilities Director to formulate a general approach in developing potential rate scenarios for consideration. A progress meeting with the Manager, Attorney, Chief Financial Officer, and Utilities Director provided direction for development of three (3) rate scenario alternatives for consideration.

Alternative Rate Scenarios

Rate scenario alternatives were constructed using several guiding principles developed collaboratively by McGill and County Staff. In order of priority, these principles include attaining full recovery of all utility costs throughout the 10-year planning period, followed by developing greater alignment between cost-of-service and user charges, adjusting the existing rate structure in a manner that advances revenue balance between customer classes, maintaining the increasing rate tiers to encourage conservation, and continuing with rates that are comparable to other water utilities in the region.

The following three (3) rate scenarios were developed for consideration:

- Existing Rates – This approach assumes current rates remain the same through the 10-year planning period, and new revenue can only be generated through expansion of the customer base. This approach does not produce sufficient revenue. Annual revenue shortfalls begin in year 1 and continues through the end of the planning period. Fund Balance is depleted by year 4. The total deficit by year 10 is over $10 million.
- Just-In-Time Rate Adjustments – This is the most common approach in determining the amount of new revenue required to meet all expenses (full cost recovery) in each year. Rate increases are required beginning in year 1 at 8%. Subsequent years require increases of 7%, 6%, 5%, 4%, 3%, then 2% for the final 4 years of the planning period.
- Interval Rate Adjustments – This approach is less common given the need for larger increases following a given number of years with no rate increase. A revenue increase of 24.4% is required in year 1, with an additional 6.0% needed after a 5-year interval to generate revenue sufficient for the 10-year planning period.

Recommendation

The Interval Rate Adjustment is recommended for County Board approval and implementation following input, review and direction given by County Staff. This approach is based on the needs identified by Staff to increase revenues that have remained fairly flat (additional revenue generated by new customers only) since the last rate increase in 2014, coupled with the need to generate revenue sufficient to cover all projected expenses over the 10-year planning period.

The larger rate increase programmed for year 1 more effectively covers the revenue needs for the bulk of the CIP that occurs in the first 5 years. Producing a greater amount revenue in the first year(s) of the planning period also has a compounding effect that reduces the overall revenue needs in subsequent years. In this case the long-term savings could be up to 10% depending on how closely the assumptions used in the financial forecast hold to future events. Effectively funding these projects address the County's goal to upgrade and expand water treatment and delivery capacity to provide adequate water of equal quality (reverse osmosis) to all of its customers.

## Project Approach

Through the Comprehensive Evaluation and Master Plan, CIP and financial analysis, Pasquotank County continues to advance development and implementation of a long-term water infrastructure management approach that identifies and adequately addresses critical infrastructure needs, focusing on water quality, system reliability, operational efficiency, and sustainability. This effort is built upon knowledgeable and experienced staff, supported by competent professionals that together can accurately determine both the physical and financial needs of the utility, along with an implementation strategy and guidance that will result in continued short and long-term stability of water revenues and user rates.

## Objective and Scope

The objective and scope of services are set forth as the basis for the rate study methodology and recommendations consists of the following related tasks:

1. Determine Revenue Requirements – The cost of system services with the intent of establishing rates sufficient to support all expenses anticipated through the 10-year planning period.
2. Consider Alternate Approaches – Develop alternative rate scenarios that meet revenue requirements for evaluation.
3. Apply Guiding Principles – Use an agreed upon set of guidelines that address the operational and financial priorities of the utility.
4. Propose Rates – Develop rate recommendations that integrate cost components across the customer base.
5. Compare Benchmark Utilities – Review rates of comparable utilities in the region.

The water rate study has been completed based on these tasks, which are documented in this report.

## Rate Study Methodology

The generally accepted methodology for conducting water utility rate studies is the AWWA (American Water Works Association), M1 – Manual of Water Supply Practices: Principles of Water Rates, Fees and Charges, 7th Edition, and serves as the basis for the analytical work applied to the project scope.

AWWA methodology is generally described as follows:

- Revenue Requirements Analysis: Compares existing revenues to the operating, capital, and policy driven costs to establish the adequacy of cost recovery levels throughout the planning period.
- Cost of Service Analysis: Identifies and apportions annual revenue requirements to each customer class based on the relative demands placed on the water system.
- Rate Design: Considers both the level and structure of the rate design to collect the revenue requirements from each class of service.

McGill considers its project team an extension of our client's staff and therefore, the approach to project management relies on frequent communications and review of the progress. Pasquotank County's staff worked extremely well using this approach and provided the necessary information, inputs, review, and direction in a timely manner that proved to be successful.

McGill also provided progress updates to the County Utilities Committee at two public meetings and a final summary report was presented to the County Finance Committee March 7, 2022.

## Determine Revenue Requirements

The Revenue Requirements analysis determined revenue adjustments (increases) that are necessary to meet the financial obligations of the water utility in each year of the 10-year planning period. This analysis includes capital investments identified in the Capital Improvements Plan (CIP) and determines the amount and timing of revenue adjustments required to address revenue shortfalls that are identified under the existing user rates and charges.

Assumptions:
The financial model, created specific to historical information, established trends, and known inputs provided by the County, will reasonably project revenues and expenses. The following key assumptions are applied through the 10-year planning period in the FY22 Revenue Requirements Analysis:

- Revenue - Existing Rates
    a. Metered sales - revenue growth generated by additional water customers: Historical data shows 3-year revenue growth just above 1% annually. The FY22 budget anticipates 1% annual growth. The model will use 1.0% as a starting point to represent system growth.
    b. Other Operating Revenue: 1.0% growth of tap fees, disconnection/reconnection, penalties, interest, investments, etc.
    c. System Development Fees: Revenue anticipated from this source is based on historical data and budget forecast.
    d. South Mills Acquisition adds 1,100 customers, primarily residential, anticipating 3,000 gallons of demand per connection per month.

- Operating Expenses
    a. Labor Expenses: 3.0% annual increases in salaries and benefits.
    b. Other Expenses: 2.3% annual increases in contracted services, utilities, communications, supplies, vehicle maintenance and other expenses.

- Capital Improvements Plan
    a. American Rescue Plan Act (ARPA) funding in the amount of $3.8 million will be used to offset a significant portion of the overall CIP scheduled for FY23.
    b. The Capital Improvements Plan (CIP) uses a 3% annual construction cost escalation factor based on the RS Means Construction Cost Index, 3-year average through January 2021. For FY22, Utilities Staff recommended increasing the cost escalation factor by an additional 2%, bringing the increase applied to FY23 to 5%, which is applied to construction costs developed in 2020 for the Master Plan. This one-time inflation factor adjustment addresses additional construction cost inflation and supply chain issues that are currently impacting overall project costs.
    c. All vehicles and equipment purchases will be cash funded.

The following table summarizes revenues generated under existing rates compared to new revenue required through rate increase(s) to reach a level sufficient to adequately address all forecasted expenses through the 10-year planning period.

| Revenue Requirements: 10-Year Projection | | | | |
|---|---|---|---|---|
| Current Year: 2022 | | Revenue Required by Rate Increase(s) | | |
| Category | Revenue | New Revneue | Total | Increase |
| Current Rates | $ 4,133,000 | $ 1,388,000 | $ 5,521,000 | 33.6% |

## Alternate Rate Scenarios

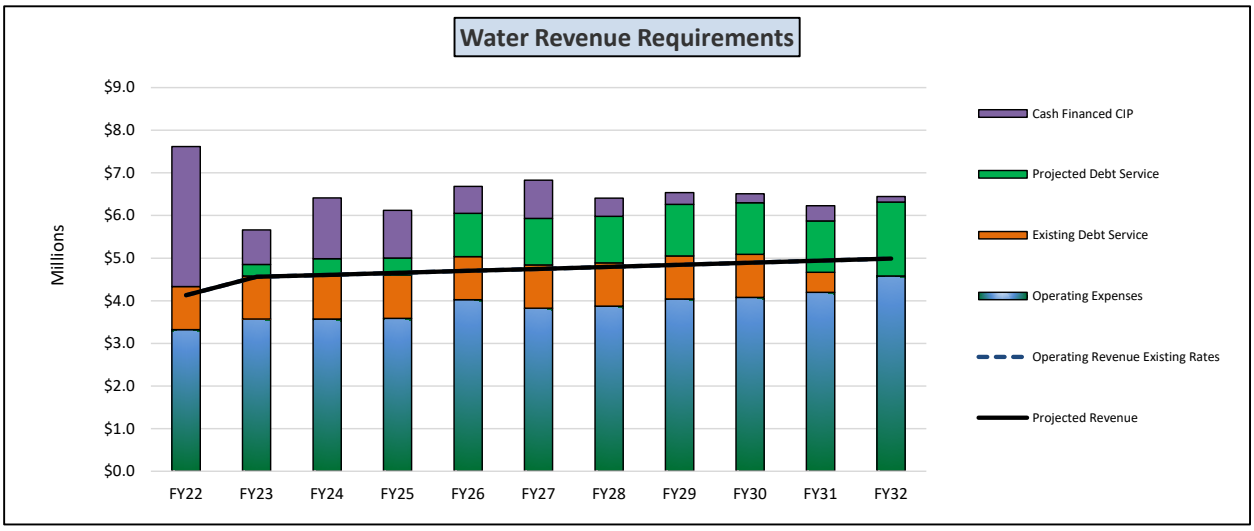
Rate scenario alternatives were constructed to allow Staff to evaluate various impacts associated with each approach and that will best serve the customer base. A financial model using the assumptions stated in the previous section are used to calculate the Revenue Requirements outcomes for each scenario and a summary chart of the outcomes is presented following each scenario description. For each chart, the stacked columns represent expenses that are broken out into the various cost categories. Lines represent revenues. The legend provides labels for each data set.

A complete set of outputs for each model run including tabular results for each data set are included in the Appendix.

- Scenario 1:  Continue with Existing Rates

  This approach assumes current rates remain the same through the 10-year planning period, and new revenue can only be generated through expansion of the customer base.  This approach does not produce sufficient revenue.  Annual revenue shortfalls begin in year 1 at just over $1 million, escalating above $2 million by year 5, then declines slightly through year 10.  The average annual shortfall over the planning period is $1.6 million.  and continues through the end of the planning period.  Fund Balance is depleted by year 4.  The total deficit by year 10 is over $16 million.

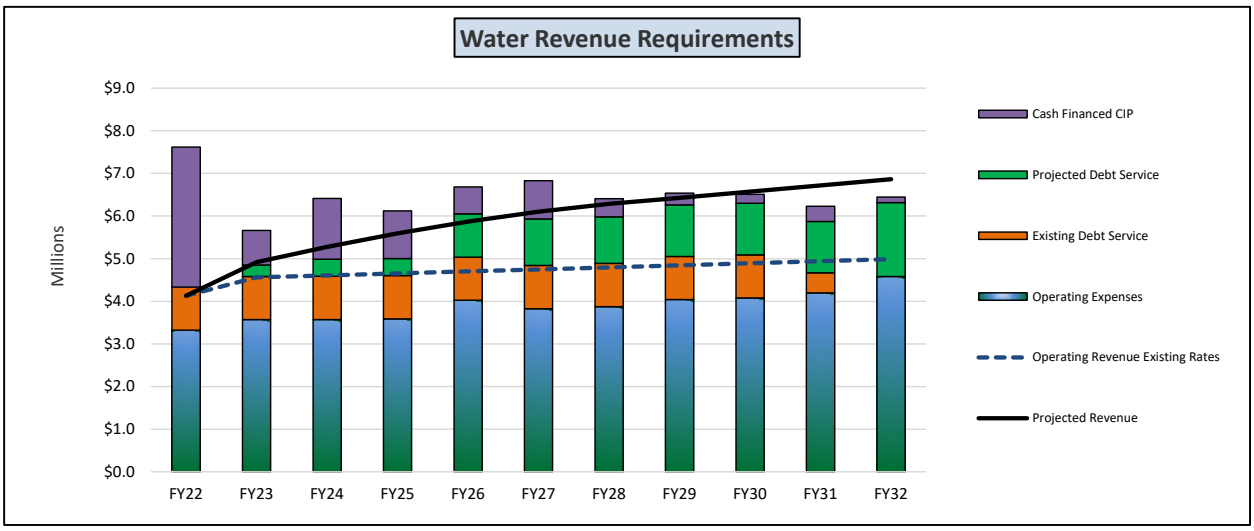
Scenario 1 Revenue Requirements Summary Chart – Existing Rates



- Scenario 2:  Just-in-Time Rate Adjustments

  This is the most common approach, determining the amount of new revenue required to meet all expenses (full cost recovery) for each year of the planning period.  Rate increases (as needed) are calculated to cover projected shortfall(s) in each year they are anticipated to occur.  Beginning in year 1, an 8% increase is required, followed by 7%, 6%, 5%, 4%, 3%, then 2% for the final 4 years of the planning period.  Fund Balance is reduced from just over $6 million to just under $2 million by year 6, then recovering to $2.8 million (25% above target) by year 10.

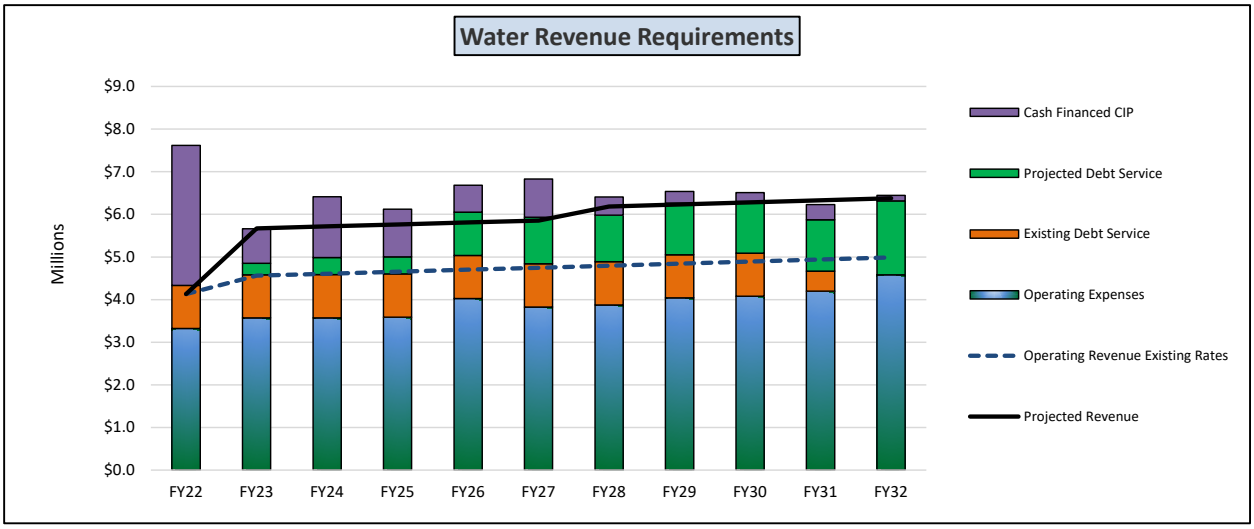
Scenario 2 Revenue Requirements Summary Chart – Just-in-Time Rate Adjustments



- Scenario 3: Interval Rate Adjustments

  This approach is less common given the need for larger increases that typically follow a given number of years (interval) with no rate increases. A 24.4% revenue increase is required in year 1, generating an additional $1.1 million annually with an additional 6.0% in year 6 is required to generate revenue sufficient to meet all expenses for each year of the 10-year planning period. Fund Balance remains above $6 million in year 1 and is gradually reduced to $2.5 million (13% above target) by year 10.

Scenario 3 Revenue Requirements Summary Chart – Interval Rate Adjustments



## Apply Guiding Principles

Several guiding principles were developed collaboratively by McGill and County Staff. This approach helped direct discussion and evaluation of potential outcomes in order to establish priorities that support the overall financial and operating goals of the utility. The following principles were used to guide the rate study:

- Full Cost Recovery – The water utility must be financially self-supporting. The full cost of operations, maintenance, debt service, capital investment, and all other expenses must be supported by user rates and fees with no support from other County funds.
- Alignment Between User Charges and Cost-of-Service - The charges applied across the customer base should correlate to the costs required to provide the service. This applies primarily to recovering the cost of volume that is currently included in the customer base charge and adjusting the base charges more proportionally based on meter sizes.
- Rate Design and User Charges – Recommended rates should remain in reasonable proximity to comparable utilities in the region. Retain the current 5-tiered increasing rate structure that effectively signals conservation to customers. Advances greater balance of revenue generated between customer classes.

## Proposed Rate Structure

Proposed rates for residential and commercial customers were developed using values determined through the cost-of-service analysis and applied to the current rate structure using the guiding principles described in the previous section.

To achieve full cost recovery, user charges are distributed between customer classes based on fixed and variable system costs sufficient to cover all expenses. The following baseline calculation is a starting point that assumes all service connections are 3-bedroom single family residential units commonly referred to as Equivalent Residential Units (ERUs), and consumption is constant (no peaks or valleys) over time.

**Equivalent Residential Unit Calculation**

| Cash-Needs Basis | FY22 |
|---|---|
| Fixed Cost Subtotal | $ 1,916,076 |
| Customer Base: Equivalent Meter Basis | 8,770 |
| Base Charge per ERU | $ 18.21 |
| Variable Cost Subtotal | $ 3,822,859 |
| Water Production x1,000 gallons | 515,909 |
| Volume Cost per 1,000 gallons | $ 7.41 |

Base Charge Component

The existing rate structure included 1,000 gallons of volume in the Base Charge, causing customers paying volume charges to be overcharged for the cost of producing and delivering the first 1,000 gallons (or portion thereof) to the entire customer base. The Base Charge is calculated to generate revenue sufficient to cover the fixed costs of owning and operating the utility, independent of the costs associated with volume delivery.

The recommended rate structure removes the initial 1,000 gallons of volume from the Base Charge.

The recommended Base Charge also assigns more fixed cost to customers that require a greater share of the fixed assets that provide capacity. For connections larger than ERU (3/4 – 1 inch), a multiplier based on meter size can be applied. McGill reviewed commonly used multipliers with Staff and determined the values presented in the recommended rate structures would reasonably apply for this purpose.

Volume Charge Component

Volume charges were evaluated using the above guiding principles to ensure full cost recovery along with maintaining a reasonable balance between cost-of-service and user charges, continuing to signal water conservation to the customer base and keeping rates comparable to other municipal water utilities in the area. The following summary tables present the recommended changes to the rate structures.

| Residential | | | | | |
|---|---|---|---|---|---|
| **Current Water Rates** | | | **Proposed Water Rates** | | |
| Base Charge - Includes 1,000 gal | | | Base Charge - Includes 0 gal | | |
| All Meter Sizes | $ | 15.00 | 3/4" - 1" Meter | $ | 18.00 |
| | | | 2" Meter | $ | 25.00 |
| Volume Charges per 1,000 gal | | | Volume Charges per 1,000 gal | | |
| Tier 1: 1,001 - 5,000 gal | $ | 6.00 | Tier 1: 0 - 5,000 gal | $ | 6.00 |
| Tier 2: 5,001 - 10,000 gal | $ | 7.00 | Tier 2: 5,001 - 10,000 gal | $ | 7.00 |
| Tier 3: 10,001 - 20,000 gal | $ | 8.00 | Tier 3: 10,001 - 20,000 gal | $ | 8.00 |
| Tier 4: 20,001 - 30,000 gal | $ | 9.00 | Tier 4: 20,001 - 30,000 gal | $ | 9.00 |
| Tier 5: 30,001 gal + | $ | 10.00 | Tier 5: 30,001 gal + | $ | 10.00 |

| Commercial | | | | | |
|---|---|---|---|---|---|
| **Current Water Rates** | | | **Proposed Water Rates** | | |
| Base Charge - Includes 1,000 gal | | | Base Charge - Includes 0 gal | | |
| All Meter Sizes | $ | 15.00 | 3/4" - 1" Meter | $ | 18.00 |
| | | | 2" Meter | $ | 25.00 |
| | | | 3" Meter | $ | 32.00 |
| | | | 4" Meter | $ | 86.00 |
| | | | 6" Meter | $ | 119.00 |
| | | | 8" Meter | $ | 151.00 |
| Volume Charges per 1,000 gal | | | Volume Charges per 1,000 gal | | |
| Tier 1: 1,001 - 5,000 gal | $ | 6.00 | Tier 1: 0 - 5,000 gal | $ | 7.50 |
| Tier 2: 5,001 - 10,000 gal | $ | 6.00 | Tier 2: 5,001 - 10,000 gal | $ | 7.50 |
| Tier 3: 10,001 - 20,000 gal | $ | 6.00 | Tier 3: 10,001 - 20,000 gal | $ | 7.50 |
| Tier 4: 20,001 - 30,000 gal | $ | 6.00 | Tier 4: 20,001 - 30,000 gal | $ | 7.00 |
| Tier 5: 30,001 gal + | $ | 6.00 | Tier 5: 30,001 gal + | $ | 6.50 |

The following tables compare monthly water bills between current and proposed rates for a series of volume amounts across each customer class:

| Residential Monthly Bill Comparison | | | | |
|---|---|---|---|---|
| Current Water Rates | | Proposed Water Rates | | |
| Volume (gallons) | Bill Amount | Bill Amount | Difference | Percent |
| No Volume | $ 15.00 | $ 18.00 | $ 3.00 | 20% |
| 1,500 gallons | $ 18.00 | $ 27.00 | $ 9.00 | 50% |
| 3,000 gallons | $ 27.00 | $ 36.00 | $ 9.00 | 33% |
| 3,400 gallons | $ 29.40 | $ 38.40 | $ 9.00 | 31% |
| 4,000 gallons | $ 33.00 | $ 42.00 | $ 9.00 | 27% |
| 5,000 gallons | $ 39.00 | $ 48.00 | $ 9.00 | 23% |
| 10,000 gallons | $ 74.00 | $ 83.00 | $ 9.00 | 12% |
| 20,000 gallons | $ 154.00 | $ 163.00 | $ 9.00 | 6% |
| 30,000 gallons | $ 244.00 | $ 253.00 | $ 9.00 | 4% |
| 40,000 gallons | $ 344.00 | $ 353.00 | $ 9.00 | 3% |

| Commercial Monthly Bill Comparison | | | | |
|---|---|---|---|---|
| Current Water Rates | | Proposed Water Rates | | |
| Volume (gallons) | Bill Amount | Bill Amount | Difference | Percent |
| No Volume | $ 15.00 | $ 18.00 | $ 3.00 | 20% |
| 1,700 gallons | $ 19.20 | $ 30.75 | $ 11.55 | 60% |
| 5,000 gallons | $ 39.00 | $ 55.50 | $ 16.50 | 42% |
| 30,000 gallons | $ 189.00 | $ 245.00 | $ 56.00 | 30% |
| 50,000 gallons | $ 309.00 | $ 340.00 | $ 31.00 | 10% |
| 100,000 gallons | $ 609.00 | $ 665.00 | $ 56.00 | 9% |
| 200,000 gallons | $ 1,209.00 | $ 1,315.00 | $ 106.00 | 9% |
| 400,000 gallons | $ 2,394.00 | $ 2,622.00 | $ 228.00 | 10% |
| 800,000 gallons | $ 4,809.00 | $ 5,276.00 | $ 467.00 | 10% |
| 1,000,000 gallons | $ 6,009.00 | $ 6,576.00 | $ 567.00 | 9% |
| 2,000,000 gallons | $ 12,009.00 | $ 13,109.00 | $ 1,100.00 | 9% |
| 3,000,000 gallons | $ 18,009.00 | $ 19,641.00 | $ 1,632.00 | 9% |

## Recommended Rate Adjustments

The Interval Rate Adjustment approach is recommended for County Board approval and implementation. This approach is based on the need to generate revenue sufficient to cover all projected expenses over the 10-year planning period. Revenue has remained fairly flat since the last rate increase in 2014, with additional revenue only available by additional customers.

The larger rate increase programmed for year 1 more effectively covers the revenue needs for the bulk of the CIP that occurs in the first 5 years. Producing a greater amount revenue in the first year(s) of the planning period also has a compounding effect that reduces the overall revenue needs in subsequent years. In this case the long-term savings are about 10% depending on how closely the assumptions used in the financial forecast hold to future events. Effectively funding these projects address the County's goal to upgrade and expand water treatment and delivery capacity, improve pressure, and provide water of equal quality (reverse osmosis) to all customers.

The average residential water bill increases $9.00 per month in the first year, followed by a 5-year interval with no additional increases. Then $2.46 in year 6, followed by no additional increases through year 10. This translates into the following:

**Average Monthly Residential Water Bill: 3,400 gallons ***

| Current Rate | 10-year Rate Adjustment Projection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FY22 | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
| $29.40 | $38.40 | $38.40 | $38.40 | $38.40 | $38.40 | $40.86 | $40.86 | $40.86 | $40.86 | $40.86 |
| $ change | $9.00 | $0.00 | $0.00 | $0.00 | $0.00 | $2.46 | $0.00 | $0.00 | $0.00 | $0.00 |
| % change | 30.6% | 0.0% | 0.0% | 0.0% | 0.0% | 6.4% | 0.0% | 0.0% | 0.0% | 0.0% |

* Average residential use is approximately 3,400 gallons. Calculation is based on a 3/4 inch meter.

The average commercial water bill increases $56.00 per month in the first year, followed by a 5-year interval with no increases. Then $15.00 in year 6, followed by no increases through year 10. This translates into the following:

**Average Monthly Commercial Water Bill: 30,000 gallons ***

| Current Rate | 10-year Rate Adjustment Projection | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FY22 | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
| $189.00 | $245.00 | $245.00 | $245.00 | $245.00 | $245.00 | $260.00 | $260.00 | $260.00 | $260.00 | $260.00 |
| $ change | $56.00 | $0.00 | $0.00 | $0.00 | $0.00 | $15.00 | $0.00 | $0.00 | $0.00 | $0.00 |
| % change | 29.6% | 0.0% | 0.0% | 0.0% | 0.0% | 6.1% | 0.0% | 0.0% | 0.0% | 0.0% |

* Average commercial use is approximately 30,000 gallons. Calculation is based on a 2 inch meter.

## Wholesale Water Rate

Wholesale water service is defined as delivery of water to a purchasing utility from a separate owner utility for the purpose of reselling water to the purchasing utility's retail and/or other customers. Pasquotank County, as owner of the assets providing this service, is responsible for planning, design, construction, financing, operating, and maintaining these assets. American Water Works Association (AWWA) has established industry-standard methodologies to determine the costs and risks associated with these responsibilities from which an equitable wholesale water rate may be calculated.

Methodologies presented in the AWWA Manual of Practice M1 – Principles of Water Rates, Fees and Charges recommended to develop wholesale water service rates and charges include the Cash-Needs Basis and Utility Basis. Both methods include the cost of operation and maintenance, the cost of capital, and transfers, i.e., to/from reserves, contingency, etc. The primary difference in these methods is inclusion of Return on Investment (ROI) using the Utility Basis.

ROI is typically viewed as fair compensation to the ratepayers (owners) of the providing utility for the risks associated with delivering an equal level of service to other customers that are outside the jurisdiction (service territory) of the utility. The most prevalent risks are the purchasing utility developing its own water supply and purchasing service from another provider. Quantifying these risks and associated costs can be difficult. Alternately, ROI can be approximated based on investor-owned utilities; however, the inputs used by these utilities i.e., dividends, etc., do not align well with government-owned utilities.

The Cash-Needs approach is most commonly used by government-owned utilities and is the basis for the total revenue requirements analysis for the current rate study effort and does not include ROI. Potential risks associated with ROI were discussed with the County and considered low enough to be excluded from the cost calculation.

Therefore, the wholesale water service rate is determined as follows using the Cash-Needs Basis:

**Wholesale Cost Calculation**

| Cash-Needs Basis | FY22 |
|---|---|
| Operation and Maintenance | $ 850,434 |
| Debt Service Existing | $ 1,086,303 |
| Debt Service Plant Upgrade | $ 304,347 |
| Total Cost | $ 2,241,084 |
| Water Production x1,000 gallons | 288,413 |
| Cost per 1,000 gallons | $7.77 |

## Bulk Water Rate

Bulk water rate applies to purchases typically made from hydrants or designated fill locations. The cost for the source water, treatment, pumping and distribution would all be applicable with minimal costs for providing temporary meters and billing, compared to the full cost of meters, meter readings, maintenance, billing, accounting, etc., that would be included for full cost for retail water sales.

Therefore, the bulk water rate is determined as follows:

**Bulk Water Cost Calculation**

| Cash-Needs Basis | FY22 |
|---|---|
| Total Expenses | $ 3,680,666 |
| Capital Investment | $ 1,808,399 |
| Total Cost | $ 5,489,065 |
| Water Production x1,000 gallons | 515,909 |
| Cost per 1,000 gallons | $10.64 |

## Additional Master Meters

Master meters are required at four (4) locations to eliminate non-metered service currently supplied to the City of Elizabeth City. The County is considering installation of these meters and recovering the cost through a surcharge that is based initially on an engineer's construction cost estimate. When construction is complete, the surcharge will be adjusted to cover actual costs. The terms of repayment is based on a 74-month schedule with no interest, which is similar to previous payment terms with Elizabeth City for water transmission lines.

**Master Meter Surcharge Calculation**

| | | |
|---|---|---|
| Surcharge Duration in Months | | 74 |
| Capital Cost Estimate | $ | 800,000 |
| Total Surcharge per Month | $ | 10,811 |
| Number of Meters | | 4 |
| Monthly Surcharge per Meter | $ | 2,703 |

## Financial Model Output: Interval Rate Adjustment Approach

McGill prepared a financial model to determine revenue requirements and revenue adjustments necessary to recover all costs for operations, maintenance and capital improvements anticipated for the 10-year planning period. The following narrative explains the model outputs using the Interval Rate Adjustment Approach reported in the various sections; *Revenue, Expenses, Percent Increase Applied, Financial Outcomes, Effect on Customer Bills, Financial Indicator, Summary Chart and Capital Investment*.

The Financial Model Output Summary is attached in the Appendix.

- Revenue

  *Operating Revenue Existing Rates* is the first entry in the *Revenue* section, and includes additional revenue anticipated by system growth, 1,100 customers from the South Mills acquisition and other new customers anticipated to be added to the system. Growth to the existing customer base is assumed at 1% per year. South Mills Customers are assumed to generate approximately $360,000 in additional revenue beginning in FY23 based on an average consumption of 3,000 gallons per customer per month. A growth rate of 1% is applied thereafter.

  *New Revenue* generated by rate adjustments is the next entry, reported as a cumulative amount and is applied to across-the-board to all customer classes in the model (residential, commercial, and wholesale). Variation in rate change assignments is considered in the cost-of-service analysis. Other revenue increases from customer growth, tap fees, penalties, investments, etc., are included in *Operating Revenue Existing Rates.* This allows revenue amounts strictly from rate adjustments to be easily identified and understood.

  *Projected Revenue* is the combined total of Operating Revenue and New Revenue and appears in the *Summary Chart* as the solid black line.

- Expenses

  *Cash Financed CIP* is the annual sum of capital improvements funded through equity sources. The amount of cash-financed CIP is based on availability of equity sources, i.e., reserves, transfers, fund balance, grants, etc.

  McGill worked closely with County Staff to determine the availability of equity funding to address CIP costs. The approach was balanced against a target value of 20% overall funding from equity sources. This benchmark is from the Water Research Foundation Study, "Performance Benchmarking for Effectively Managed Water Utilities" as the level of capital investment from equity sources that is considered financially viable. This benchmark was used as a check point to see the balance between debt-financed and equity-funded capital investments. The calculated value over the 10-year planning period is 21%.

  *Projected Debt Service* is the series annual debt service obligations anticipated to be funded through loans, bond issues or other borrowing. The model assumes these loans to be a 20-year term and interest to be 2.6% for FY23, increasing 0.2% each fiscal year through FY29 and

continuing at 3.8% through FY32. Projected debt service amounts are quantified in the *Data Table* and appears in the *Summary Chart* as the green component of the columns.

*Existing Debt Service* represents current debt obligations for capital purchases and completed capital improvements projects. Existing debt service amounts are quantified in the Data Table and appears in the *Summary Chart* as the orange component of the columns.

*Operating Expenses* are day-to-day operations and maintenance of the utility including labor, utilities, contracted services, supplies, insurance, travel, training, fund transfers, reserves, and contingency. Operating expenses are quantified in the *Data Table* and appears in the *Summary Chart* as the blue component of the columns.

- Percent Increase Applied

  *Percent Increase Applied* reports the amount of new revenue realized by rate increases as a percent of total of projected revenue. Revenue increases recommended for the water fund will require an overall rate increase of 25% applied in FY23 and 6.0% applied in FY28. This translates into additional revenue of 24.3% and 5.8% as shown in the model output, since rate adjustments do not apply to other fees such as penalties, connections, etc.

- Financial Outcomes

  *Financial Outcomes* calculated by the financial model demonstrates projected revenue from the rate adjustments proposed in this model run is sufficient to sustain the utility over the 10-year planning period. The model output does, however, show revenue shortfalls in 8 of 10 years. Theses shortages are covered using available Fund Balance.

  The ongoing effect on Fund Balance is shown in the *Financial Indicator* section, tracking the overall fund amount, and the number of days cash on hand, generally reducing from a maximum of nearly 400 days to maintaining above a target value of 120 days at year 10. The 120-day target is based on a discussion with County Staff of industry standard benchmark values presented and evaluated in several water industry research publications. Typical target values ranged from 30 to more than 300 days, with the upper end of the range driven primarily on bond rating criteria. With all relevant factors considered, 120 days was determined to be a reasonable target value.

- Effect on Customer Bills

  *Effect on Customer Bills* are the dollar amounts on the average 3,400 gallon monthly residential water bill and average 30,000 gallon monthly commercial water bill. Net monthly increases are shown for each customer bill.

- Financial Indicator

  *Fund Balance Tracker* reports the general health of the utility fund. The FY22 Budget input of $9.2 million is used as a beginning point for FY22. Cash-Funded CIP in FY22 is anticipated to be $3.2 million which brings Fund Balance to $6.0 million as the beginning point for FY23.

Target Fund Balance is tracked in terms of number of days Fund Balance could cover all expenses in the absence of any revenue. County Staff determined 120 days to be a reasonable benchmark target.

- Water Utility Capital Investment

  Projected Capital Improvements are summarized in the Financial Model Output table to provide a quick reference to the amount and timing of capital investments relative to the financial model outputs. The CIP schedule is based on the September 2020 Green Engineering Water Department Comprehensive Evaluation and Master Plan 2020-2040 with revisions coordinated with the County's Utilities Director.

  The Capital Improvements Plan uses a 3% annual construction cost escalation factor based on the RS Means Construction Cost Index, 3-year average, 2018 through January 2021. The cost escalation factor was reviewed with County staff and increased to 5% for FY22 to address additional construction cost inflation and supply chain issues.

  Capital Investment has the most impact on cash-flow, long-term debt, and user rates. Annual review and adjustment of CIP is recommended, along with careful management of equity funding and debt service.

  A detailed Capital Improvements Plan is attached in the Appendix.

## Benchmark to Water Utilities in the Area

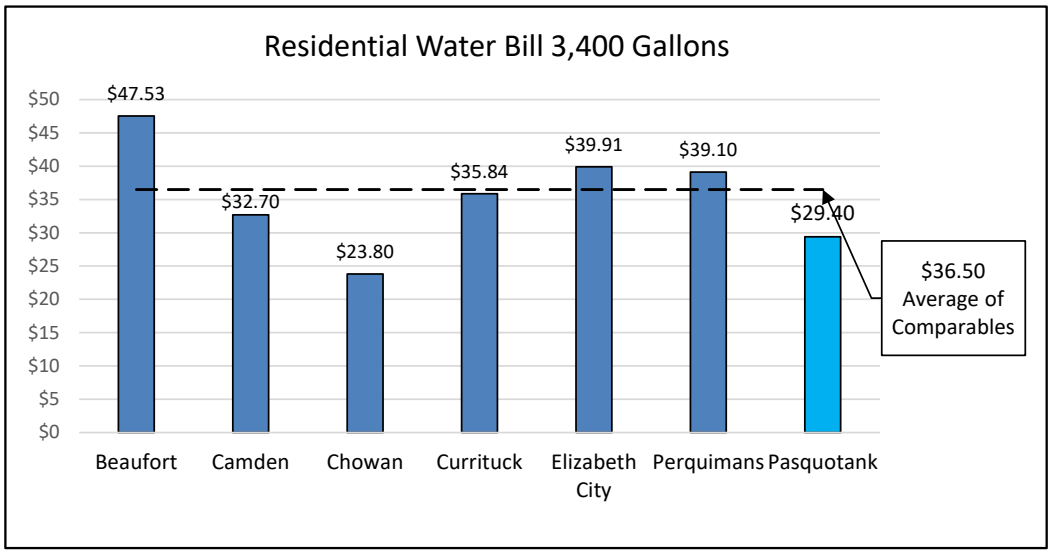
Comparisons were made with six (6) water utilities in the immediate area having similar water supplies, treatment processes and customer bases:

1. Beaufort County
2. Camden County
3. Chowan County
4. Currituck County
5. City of Elizabeth City
6. Perquimans County

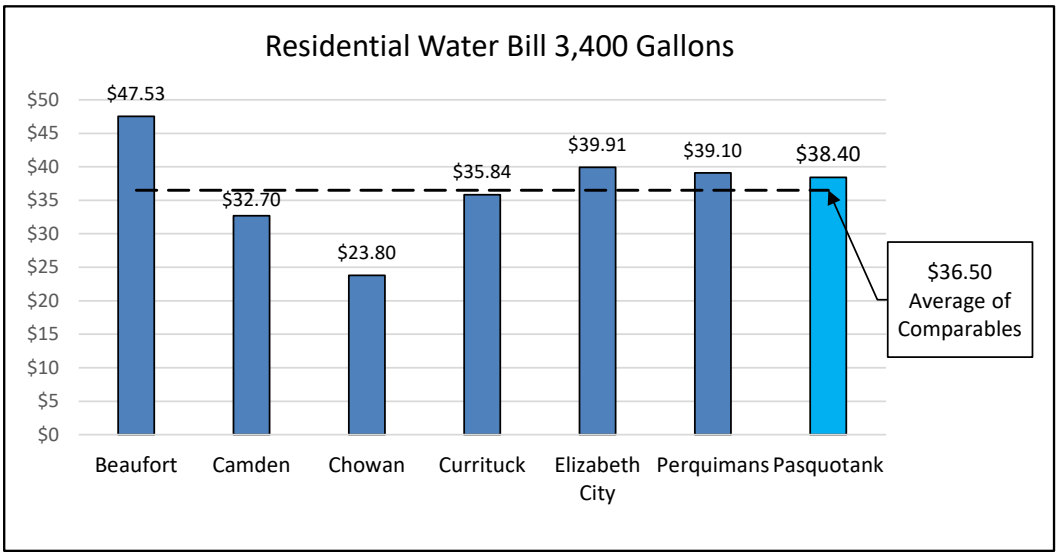
Comparisons using Pasquotank County's existing rates and the recommended increase are presented in graphic format using the following data points from monthly water bills among the forementioned water utilities in the immediate area:

- Average Monthly Residential Water Bill – 3,400 gallons. Residential consumption patterns in the immediate area are assumed to be comparable and therefore average monthly bill amounts.
- Median Monthly Commercial Water Bill – 1,700 gallons. The vast majority of commercial accounts consume far less than the average. This data point allows a comparison of monthly bills closer to the consumption level of most commercial customers.
- Average Monthly Commercial Water Bill – 30,000 gallons. With several commercial customers posting large monthly consumption, this value allows a comparison.

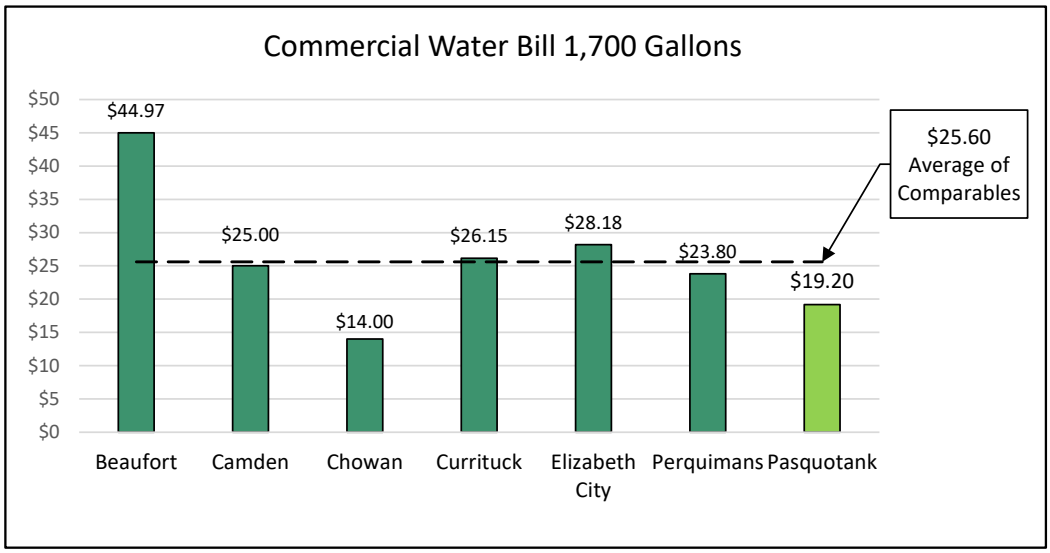
## Average Monthly Residential Water Bill: Existing Rates



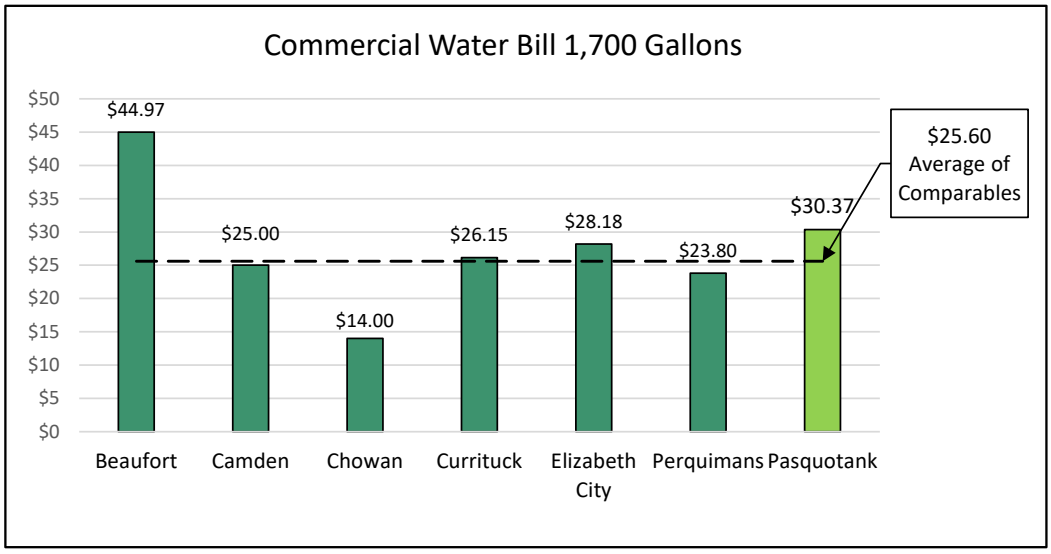

## Average Monthly Residential Water Bill: Proposed Rates



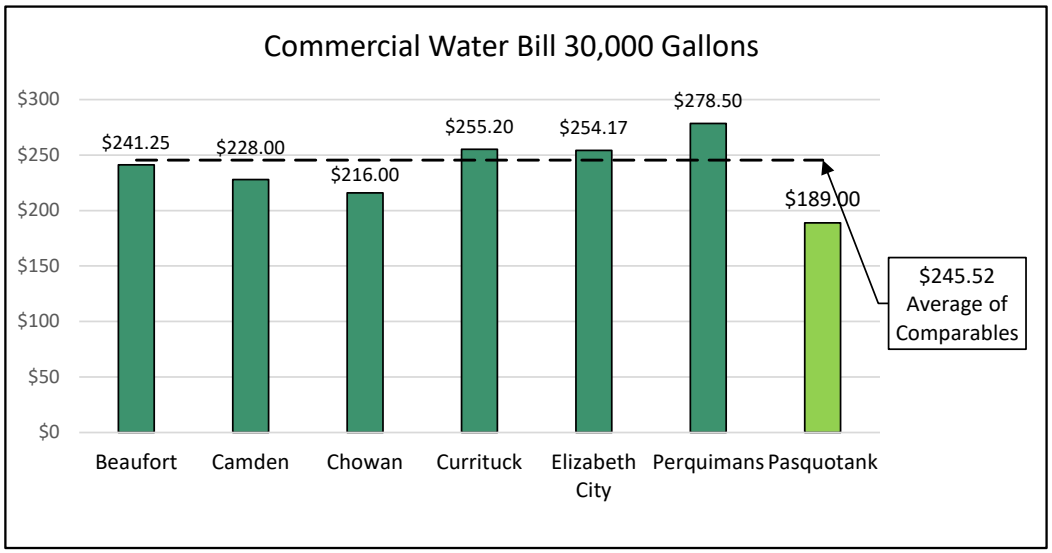
## Median Monthly Commercial Water Bill: Existing Rates



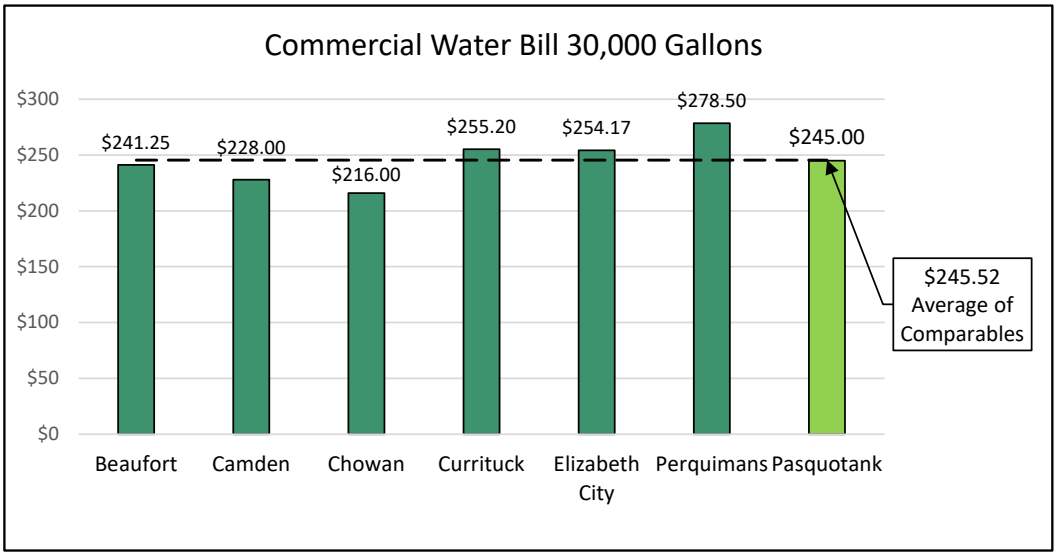

## Median Monthly Commercial Water Bill: Proposed Rates



## Average Monthly Commercial Water Bill: Existing Rates




## Average Monthly Commercial Water Bill: Proposed Rates



## Acknowledgments

McGill Associates would like to express appreciation for the opportunity to perform this work for Pasquotank County. We especially appreciate the following contributions to the process of developing the rate study recommendations:

County Manager Sparty Hammett for clear guidance, strong direction and timely communications throughout the process, Utilities Director David Smithson and Utilities Office Manager Melissa Joines for providing extensive background material and responding to numerous technical questions, Finance Officer Sheri Small for making essential financial records available for our review, County Attorney R. Michael Cox for providing valuable insight on intergovernmental agreements.

It should also be noted the Utilities Committee reviews during the process contributed significantly to the supporting information and analysis provided in the final product.

Producing this report was a team effort requiring significant assistance from key members of the management staff, and the final product truly reflects a collaborative effort. We are committed to Shaping Communities Together with our clients, so we would welcome additional opportunities to assist Pasquotank County in the future.

## Appendix

Capital Improvements Plan

Financial Model Output Summaries

- Existing Rates
- Just-in-Time Rate Adjustments
- Interval Rate Adjustments

# Pasquotank County, NC

# Capital Improvements Plan

## Water System Fund
## 10-Year Planning Period

### Water Plants and Supply Wells

| Project Number | Project Description | 10-Yr CIP Cost Cost | Test Year 2022 | FY 1 2023 | FY 2 2024 | FY 3 2025 | FY 4 2026 | FY 5 2027 | FY 6 2028 | FY 7 2029 | FY 8 2030 | FY 9 2031 | FY 10 2032 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Vehicles and Equipment** | | | | | | | | | | | | | |
| 1 | Vehicle 1/2 ton Class - 1 EACH | 101,500 | 30,000 | 30,900 | | | | 34,780 | 35,820 | | | | |
| 2 | Vehicles 3/4 ton Class - 1 EACH | 181,090 | 37,000 | | | 40,430 | | | | 45,510 | 46,870 | 48,280 | |
| 3 | Vehicles 3/4 ton Class - 1 EACH | - | | | | | | | | | | | |
| **Plant Upgrades and Improvements** | | | | | | | | | | | | | |
| **RO WTP Upgrades** | | | | | | | | | | | | | |
| 1 | Preliminary Engineering Report and Environmental for RO Addition | - | 60,000 | | | | | | | | | | |
| 2 | 3 MGD Upgade RO Plant (incl technical and contingency) | 4,732,380 | | 4,732,380 | | | | | | | | | |
| **Weeksville WTP Upgrades** | | | | | | | | | | | | | |
| 3 | New Filter Media - 2 of 8 filters | - | 16,000 | | | | | | | | | | |
| 4 | Preliminary Engineering and Environmental Report | 76,530 | | | 76,530 | | | | | | | | |
| 5 | Design Plans and Specifications | 376,760 | | | | 376,760 | | | | | | | |
| 6 | Initial Construction | 8,898,080 | | | | | 8,898,080 | | | | | | |
| 7 | Add Office Space at Billing Office & Staff Offices at Weeksville WTP | 57,040 | | 57,040 | | | | | | | | | |
| **Weeksville Well Field** | | | | | | | | | | | | | |
| 8 | Wells 1-9: 3 Wells complete replacement on new site | 979,190 | | | 979,190 | | | | | | | | |
| 9 | Wells 1-9: 3 wells with new casing / screens with new monitoring | 612,000 | | | 612,000 | | | | | | | | |
| 10 | Wells 1-9: 3 wells with clean iin place screens with new monitoring | 293,843 | | 95,067 | 97,920 | 100,857 | | | | | | | |
| 11 | Wells 1-9: Install new real time static water gauges | 200,705 | | 98,870 | 101,835 | | | | | | | | |
| 12 | Wells 1-9: Upgrade or replace flow meters w 4-20mA output | 128,660 | | 63,380 | 65,280 | | | | | | | | |
| 13 | Wells 1-9: Additional Raw Water Main (estimated quantity) | 445,830 | | | | | | 445,830 | | | | | |
| 14 | Wells 10-20 Specific capacity test | 49,170 | | 49,170 | | | | | | | | | |
| 15 | Wells 10-20: Install new real time static water gauges | 126,760 | | 126,760 | | | | | | | | | |
| 16 | Wells 10-20: Upgrade or replace flow meters w 4-20mA output | 95,070 | | 95,070 | | | | | | | | | |
| 17 | Wells 21-30: Specific capacity test | 46,150 | | | 46,150 | | | | | | | | |
| 18 | Wells 21-30: Install new real time static water gauges | 124,030 | | | 124,030 | | | | | | | | |
| 19 | Wells 21-30: Upgrade or replace flow meters w 4-20mA output | 104,450 | | | 104,450 | | | | | | | | |
| 20 | Wells 1 & 2 Generators and Transfer Switches | - | 184,600 | | | | | | | | | | |
| **Subtotal - Water Plants and Supply Wells Infrastructure** | | **17,346,648** | **260,600** | **5,317,737** | **2,207,385** | **477,617** | **8,898,080** | **445,830** | **-** | **-** | **-** | **-** | **-** |
| **Total - Water Plants and Supply Wells** | | **17,629,238** | **327,600** | **5,348,637** | **2,207,385** | **518,047** | **8,898,080** | **480,610** | **35,820** | **45,510** | **46,870** | **48,280** | **-** |
| | **Test Year (FY22) CIP: Water Plants and Supply Wells** | | **327,600** | | | | | | | | | | |
| **10-Yr CIP: Water Plants and Supply Wells FY23-32** | | **17,629,238** | | **5,348,637** | **2,207,385** | **518,047** | **8,898,080** | **480,610** | **35,820** | **45,510** | **46,870** | **48,280** | **0** |

Partial Debt Financing
Debt Financed Projects

# Water System Fund
# 10-Year Planning Period

## Water Storage and Distribution

| Project Number | Project Description | 10-Yr CIP Cost Cost | Test Year 2022 | FY 1 2023 | FY 2 2024 | FY 3 2025 | FY 4 2026 | FY 5 2027 | FY 6 2028 | FY 7 2029 | FY 8 2030 | FY 9 2031 | FY 10 2032 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Vehicles and Equipment** | | | | | | | | | | | | | |
| 1 | Vehicle 1/2 ton Class - 1 EACH | 151,230 | | | | | 33,770 | | | | 38,000 | 39,140 | 40,320 |
| 2 | Vehicles 3/4 ton Class - 1 EACH | 211,120 | 37,000 | 38,110 | | 40,430 | | 42,890 | 44,180 | 45,510 | | | |
| 3 | Vehicles 3/4 ton Class - 1 EACH | - | | | | | | | | | | | |
| 4 | Equipment Backhoe | 180,060 | | | | | | | | | | 180,060 | |
| **Water Storage and Distribution** | | | | | | | | | | | | | |
| **System Extension** | | | | | | | | | | | | | |
| 1 | Acquire South Mills Water System | - | 1,591,350 | | | | | | | | | | |
| 2 | Constuct South Mills Improvements | 1,386,940 | | 448,717 | 462,180 | 476,043 | | | | | | | |
| 3 | Install 25,875 LF 12" PVC Main on US Hwy 17 bypass to N Side Rd | 1,565,000 | | | | | | | | 1,565,000 | | | |
| 4 | Connect Parsonage Streeet Extension to Casey Street | 125,550 | | | | | | 125,550 | | | | | |
| **Mega Industrial Park** | | | | | | | | | | | | | |
| 5 | 500,000 gal Elevated Storage Tank | 6,202,060 | | | | | | | | | | | 6,202,060 |
| 6 | Water Mains to Mega Park | 1,075,020 | | | | | | | | | | | 1,075,020 |
| **Distribution System Rehab / Replacement** | | | | | | | | | | | | | |
| 7 | Temporary Pump Station - Newland | - | 156,200 | | | | | | | | | | |
| 8 | Permanent Pump Station - Newland | 2,765,110 | | 2,765,110 | | | | | | | | | |
| 9 | Install Altitude Valve at Newland Water Tank | 146,950 | | | | | | | 146,950 | | | | |
| 10 | Altitude Valve Vault Upgrades Ph1 | 0 | 84,610 | | | | | | | | | | |
| 11 | Altitude Valve Vault Upgrades Ph2 | 89,760 | | | 89,760 | | | | | | | | |
| 12 | Altitude Valve Vault Upgrades Ph3 | 90,030 | | | | | 90,030 | | | | | | |
| 13 | Altitude Valve Vault Upgrades Ph4 | 119,390 | | | | | | | 119,390 | | | | |
| 14 | Replace 15,050 LF of 10" PVC with 16" PVC Oad Stump Road | 1,180,200 | | | | | | 1,180,200 | | | | | |
| 15 | Remote SCADA Access and System Upgrades | - | 150,000 | | | | | | | | | | |
| 16 | AMI Meter Additions Ph 1 | - | 600,000 | | | | | | | | | | |
| 17 | AMI Meter Additions Ph 2 | 450,200 | | | 450,200 | | | | | | | | |
| 18 | AMI Meter Additions Ph 3 | 477,620 | | | | | 477,620 | | | | | | |
| 19 | AMI Meter Additions Ph 4 | 0 | | | | | | | | | | | |
| 20 | AMI Meter Additions Ph 5 | 0 | | | | | | | | | | | |
| **Billing System and Utility Planning** | | | | | | | | | | | | | |
| 21 | Billing Computers and Printer Replacements | - | 21,220 | | | | | | | | | | |
| 22 | Munis Utility Billing Package Upgrade | - | 40,000 | | | | | | | | | | |
| 23 | AIA Studies and GIS Mapping Ph 1 | - | 175,050 | | | | | | | | | | |
| 24 | AIA Studies and GIS Mapping Ph 2 | 185,710 | | | 185,710 | | | | | | | | |
| 25 | Asset Management Plan | 73,160 | | | 73,160 | | | | | | | | |
| 26 | Complete Hydraulic Model Update Ph 1 | 52,450 | | 52,450 | | | | | | | | | |
| 27 | Complete Hydraulic Model Update Ph 2 | 92,240 | | | | | | 92,240 | | | | | |
| 28 | | - | | | | | | | | | | | |
| **Subtotal - Water Storage and Distribution Infrastructure** | | **16,077,390** | **2,818,430** | **3,266,277** | **1,261,010** | **476,043** | **567,650** | **1,397,990** | **266,340** | **1,565,000** | **-** | **-** | **7,277,080** |
| **Total - Water Storage and Distribution** | | | | **3,304,387** | **1,261,010** | **516,473** | **601,420** | **1,440,880** | **310,520** | **1,610,510** | **38,000** | **-** | **7,317,400** |
| | **Test Year (FY22) CIP: Water Storage and Distribution** | | **2,855,430** | | | | | | | | | | |
| **10-Yr CIP: Water Storage and Distribution FY23-32** | | **16,400,600** | | **3,304,387** | **1,261,010** | **516,473** | **601,420** | **1,440,880** | **310,520** | **1,610,510** | **38,000** | **0** | **7,317,400** |

## Total Water System Capital Improvements Plan

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Test Year (FY22) CIP: Total Water System** | | **3,183,030** | | | | | | | | | |
| **10-Yr CIP: Total Water System** | | **34,029,838** | | **8,653,023** | **3,468,395** | **1,034,520** | **9,499,500** | **1,921,490** | **346,340** | **1,656,020** | **84,870** | **48,280** | **7,317,400** |

Partial Debt Financing
Debt Financed Projects

**Pasquotank County, NC**
**Revenue Requirements Analysis**

# Financial Model Output Summary - Existing Rates

## Water System Fund
## 10-Year Planning Period

### Revenue

| Description | FY22 | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Revenue Existing Rates | 4,133,000 | 4,562,000 | 4,608,000 | 4,654,000 | 4,701,000 | 4,748,000 | 4,795,000 | 4,843,000 | 4,892,000 | 4,941,000 | 4,990,000 |
| New Revenue (Cumulative amount) | | - | - | - | - | - | - | - | - | - | - |
| Projected Revenue | 4,133,000 | 4,562,000 | 4,608,000 | 4,654,000 | 4,701,000 | 4,748,000 | 4,795,000 | 4,843,000 | 4,892,000 | 4,941,000 | 4,990,000 |

### Expenses

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cash Financed CIP | 3,287,000 | 814,000 | 1,427,000 | 1,115,000 | 635,000 | 897,000 | 426,000 | 273,000 | 208,000 | 355,000 | 130,000 |
| Projected Debt Service | - | 268,486 | 403,175 | 403,175 | 1,012,379 | 1,094,670 | 1,094,670 | 1,207,795 | 1,207,795 | 1,207,795 | 1,733,816 |
| Existing Debt Service | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 470,000 | - |
| Operating Expenses | 3,322,000 | 3,570,000 | 3,574,000 | 3,590,000 | 4,025,000 | 3,828,000 | 3,876,000 | 4,043,000 | 4,081,000 | 4,196,000 | 4,581,000 |

### Percent Increase Applied

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue Adjustment Percentage | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

### Financial Outcomes

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Expenses to Cover | 7,620,000 | 5,663,486 | 6,415,175 | 6,119,175 | 6,683,379 | 6,830,670 | 6,407,670 | 6,534,795 | 6,507,795 | 6,228,795 | 6,444,816 |
| Difference / (Shortage) | | (1,101,486) | (1,807,175) | (1,465,175) | (1,982,379) | (2,082,670) | (1,612,670) | (1,691,795) | (1,615,795) | (1,287,795) | (1,454,816) |

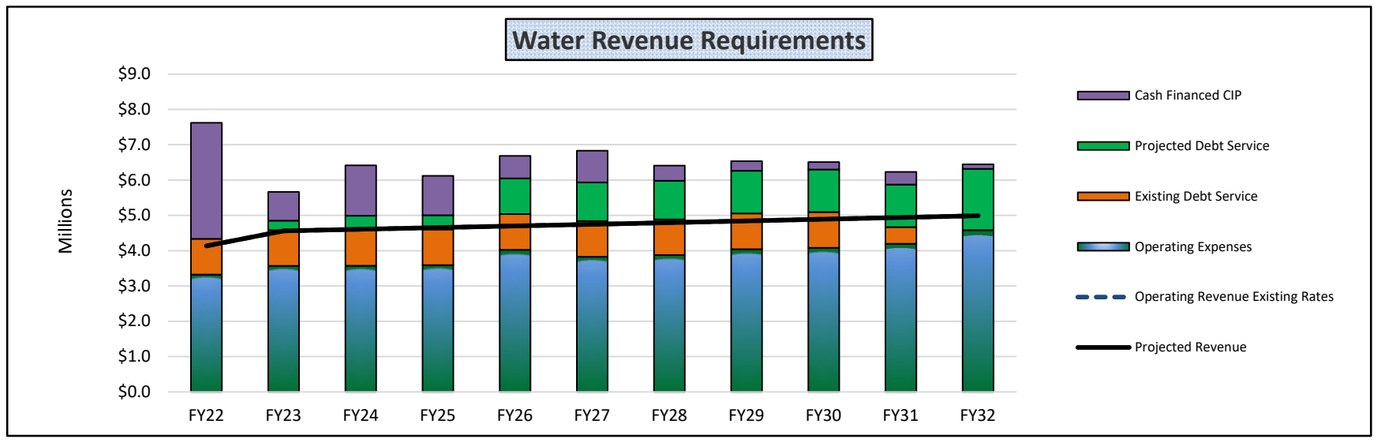
### Effect on Customer Bills

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Monthly Residential Bill 3,400 gal | $29.40 | $29.40 | $29.40 | $29.40 | $29.40 | $29.40 | $29.40 | $29.40 | $29.40 | $29.40 | $29.40 |
| Monthly Residential Bill Change | | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 |
| | | | | | | | | | | | |
| Average Monthly Commercial Bill 30,000 gal | $189.00 | $189.00 | $189.00 | $189.00 | $189.00 | $189.00 | $189.00 | $189.00 | $189.00 | $189.00 | $189.00 |
| Monthly Commercial Bill Change | | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 |

### Financial Indicator

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fund Balance Tracker | 6,051,663 | 4,950,177 | 3,143,002 | 1,677,827 | (304,552) | (2,387,222) | (3,999,892) | (5,691,688) | (7,307,483) | (8,595,278) | (10,050,094) |
| Fund Balance Days Cash on Hand | 290 | 319 | 179 | 100 | (17) | (128) | (228) | (318) | (410) | (504) | (569) |
| Target Fund Balance = 120 days of Expenses | 2,505,205 | 1,861,968 | 2,109,099 | 2,011,784 | 2,197,275 | 2,245,700 | 2,106,631 | 2,148,426 | 2,139,549 | 2,047,823 | 2,118,844 |

### Summary Chart




### Water Utility Capital Investment

| Description | Total CIP | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Plant | 16,401,000 | 3,304,387 | 1,261,010 | 516,473 | 601,420 | 1,440,880 | 310,520 | 1,610,510 | 38,000 | - | 7,317,400 |
| Wastewater Plant | - | - | - | - | - | - | - | - | - | - | - |
| Water Storage/Distribution | 17,629,000 | 5,348,637 | 2,207,385 | 518,047 | 8,898,080 | 480,610 | 35,820 | 45,510 | 46,870 | 48,280 | - |
| Total Water System CIP | 34,030,000 | 8,653,023 | 3,468,395 | 1,034,520 | 9,499,500 | 1,921,490 | 346,340 | 1,656,020 | 84,870 | 48,280 | 7,317,400 |

**Pasquotank County, NC**
**Revenue Requirements Analysis**

# Financial Model Output Summary - Just-In-Time Adjustments

## Water System Fund
## 10-Year Planning Period

### Revenue

| Description | FY22 | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Revenue Existing Rates | 4,133,000 | 4,562,000 | 4,608,000 | 4,654,000 | 4,701,000 | 4,748,000 | 4,795,000 | 4,843,000 | 4,892,000 | 4,941,000 | 4,990,000 |
| New Revenue (Cumulative amount) | | 355,000 | 668,000 | 939,000 | 1,168,000 | 1,352,000 | 1,492,000 | 1,586,000 | 1,681,000 | 1,777,000 | 1,874,000 |
| Projected Revenue | 4,133,000 | 4,917,000 | 5,276,000 | 5,593,000 | 5,869,000 | 6,100,000 | 6,287,000 | 6,429,000 | 6,573,000 | 6,718,000 | 6,864,000 |

### Expenses

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cash Financed CIP | 3,287,000 | 814,000 | 1,427,000 | 1,115,000 | 635,000 | 897,000 | 426,000 | 273,000 | 208,000 | 355,000 | 130,000 |
| Projected Debt Service | - | 268,486 | 403,175 | 403,175 | 1,012,379 | 1,094,670 | 1,094,670 | 1,207,795 | 1,207,795 | 1,207,795 | 1,733,816 |
| Existing Debt Service | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 470,000 | - |
| Operating Expenses | 3,322,000 | 3,570,000 | 3,574,000 | 3,590,000 | 4,025,000 | 3,828,000 | 3,876,000 | 4,043,000 | 4,081,000 | 4,196,000 | 4,581,000 |

### Percent Increase Applied

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue Adjustment Percentage | | 7.8% | 6.8% | 5.8% | 4.9% | 3.9% | 2.9% | 1.9% | 1.9% | 1.9% | 1.9% |

### Financial Outcomes

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Expenses to Cover | 7,620,000 | 5,663,486 | 6,415,175 | 6,119,175 | 6,683,379 | 6,830,670 | 6,407,670 | 6,534,795 | 6,507,795 | 6,228,795 | 6,444,816 |
| Difference / (Shortage) | | (746,486) | (1,139,175) | (526,175) | (814,379) | (730,670) | (120,670) | (105,795) | 65,205 | 489,205 | 419,184 |

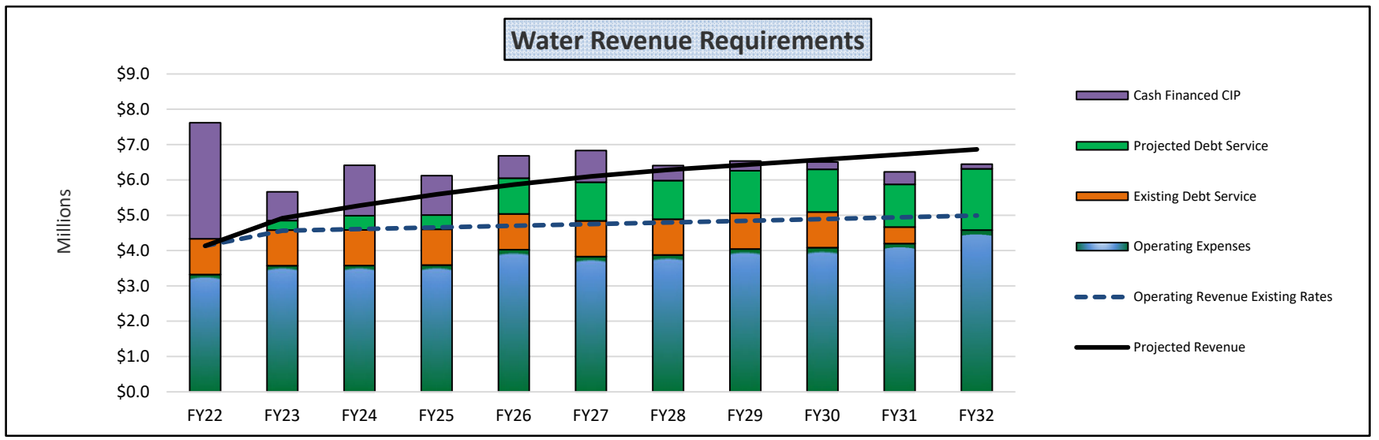
### Effect on Customer Bills

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Monthly Residential Bill 3,400 gal | $29.40 | $31.75 | $33.97 | $36.01 | $37.81 | $39.33 | $40.51 | $41.32 | $42.14 | $42.99 | $43.85 |
| Monthly Residential Bill Change | | $2.35 | $2.22 | $2.04 | $1.80 | $1.51 | $1.18 | $0.81 | $0.83 | $0.84 | $0.86 |
| | | | | | | | | | | | |
| Average Monthly Commercial Bill 30,000 gal | $189.00 | $204.12 | $217.27 | $229.34 | $240.00 | $248.95 | $256.93 | $261.72 | $266.62 | $271.60 | $276.69 |
| Monthly Commercial Bill Change | | $15.12 | $13.15 | $12.06 | $10.66 | $8.95 | $7.98 | $4.79 | $4.89 | $4.99 | $5.09 |

### Financial Indicator

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fund Balance Tracker | 6,051,663 | 5,305,177 | 4,166,002 | 3,639,827 | 2,825,448 | 2,094,778 | 1,974,108 | 1,868,312 | 1,933,517 | 2,422,722 | 2,841,906 |
| Fund Balance Days Cash on Hand | 290 | 342 | 237 | 217 | 154 | 112 | 112 | 104 | 108 | 142 | 161 |
| Target Fund Balance = 120 days of Expenses | 2,505,205 | 1,861,968 | 2,109,099 | 2,011,784 | 2,197,275 | 2,245,700 | 2,106,631 | 2,148,426 | 2,139,549 | 2,047,823 | 2,118,844 |

### Summary Chart




### Capital Investment

| Description | Total CIP | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Plant | 16,401,000 | 3,304,387 | 1,261,010 | 516,473 | 601,420 | 1,440,880 | 310,520 | 1,610,510 | 38,000 | - | 7,317,400 |
| Wastewater Plant | - | - | - | - | - | - | - | - | - | - | - |
| Water Storage/Distribution | 17,629,000 | 5,348,637 | 2,207,385 | 518,047 | 8,898,080 | 480,610 | 35,820 | 45,510 | 46,870 | 48,280 | - |
| Total Water System CIP | 34,030,000 | 8,653,023 | 3,468,395 | 1,034,520 | 9,499,500 | 1,921,490 | 346,340 | 1,656,020 | 84,870 | 48,280 | 7,317,400 |

**Pasquotank County, NC**
**Revenue Requirements Analysis**

# Financial Model Output Summary - Interval Adjustments

## Water System Fund
## 10-Year Planning Period

### Revenue

| Description | FY22 | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Operating Revenue Existing Rates | 4,133,000 | 4,562,000 | 4,608,000 | 4,654,000 | 4,701,000 | 4,748,000 | 4,795,000 | 4,843,000 | 4,892,000 | 4,941,000 | 4,990,000 |
| New Revenue (Cumulative amount) | | 1,108,000 | 1,108,000 | 1,108,000 | 1,108,000 | 1,108,000 | 1,388,000 | 1,388,000 | 1,388,000 | 1,388,000 | 1,388,000 |
| Projected Revenue | 4,133,000 | 5,670,000 | 5,716,000 | 5,762,000 | 5,809,000 | 5,856,000 | 6,183,000 | 6,231,000 | 6,280,000 | 6,329,000 | 6,378,000 |

### Expenses

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cash Financed CIP | 3,287,000 | 814,000 | 1,427,000 | 1,115,000 | 635,000 | 897,000 | 426,000 | 273,000 | 208,000 | 355,000 | 130,000 |
| Projected Debt Service | - | 268,000 | 403,000 | 403,000 | 1,012,000 | 1,095,000 | 1,095,000 | 1,208,000 | 1,208,000 | 1,208,000 | 1,734,000 |
| Existing Debt Service | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 1,011,000 | 470,000 | - |
| Operating Expenses | 3,322,000 | 3,570,000 | 3,574,000 | 3,590,000 | 4,025,000 | 3,828,000 | 3,876,000 | 4,043,000 | 4,081,000 | 4,196,000 | 4,581,000 |

### Percent Increase Applied

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Revenue Adjustment Percentage | | 24.3% | 0.0% | 0.0% | 0.0% | 0.0% | 5.8% | 0.0% | 0.0% | 0.0% | 0.0% |

### Financial Outcomes

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Expenses to Cover | 7,620,000 | 5,663,000 | 6,415,000 | 6,119,000 | 6,683,000 | 6,831,000 | 6,408,000 | 6,535,000 | 6,508,000 | 6,229,000 | 6,445,000 |
| Difference / (Shortage) | | 7,000 | (699,000) | (357,000) | (874,000) | (975,000) | (225,000) | (304,000) | (228,000) | 100,000 | (67,000) |

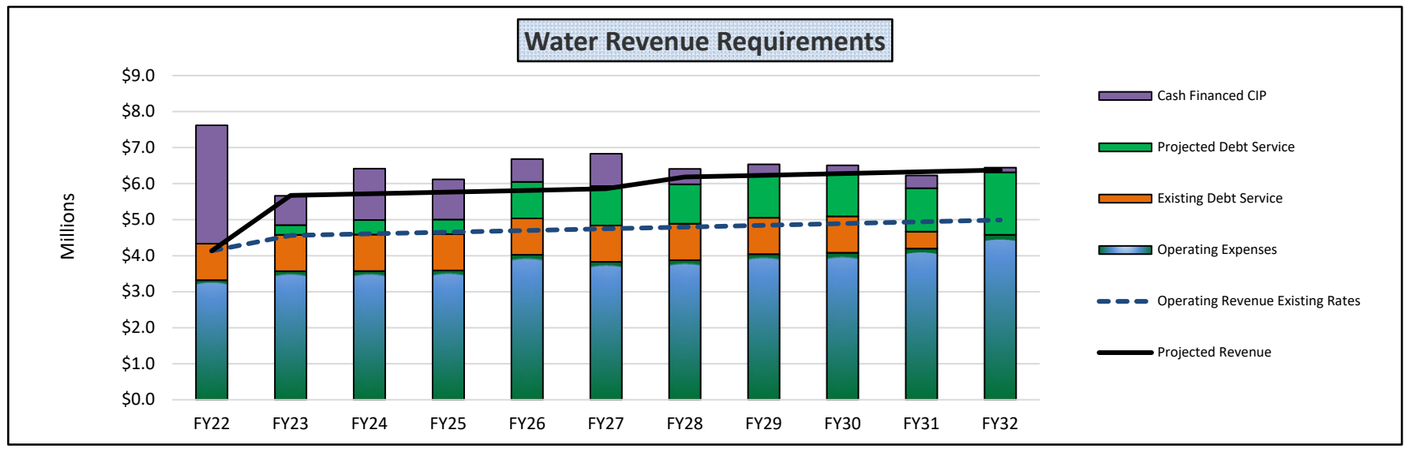
### Effect on Customer Bills

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Monthly Residential Bill 3,400 gal | $29.40 | $38.40 | $38.40 | $38.40 | $38.40 | $38.40 | $40.86 | $40.86 | $40.86 | $40.86 | $40.86 |
| Monthly Residential Bill Change | | $9.00 | $0.00 | $0.00 | $0.00 | $0.00 | $2.46 | $0.00 | $0.00 | $0.00 | $0.00 |
| | | | | | | | | | | | |
| Average Monthly Commercial Bill 30,000 gal | $189.00 | $245.00 | $245.00 | $245.00 | $245.00 | $245.00 | $260.00 | $260.00 | $260.00 | $260.00 | $260.00 |
| Monthly Commercial Bill Change | | $56.00 | $0.00 | $0.00 | $0.00 | $0.00 | $15.00 | $0.00 | $0.00 | $0.00 | $0.00 |

### Financial Indicator

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fund Balance Tracker | 6,052,000 | 6,059,000 | 5,360,000 | 5,003,000 | 4,129,000 | 3,154,000 | 2,929,000 | 2,625,000 | 2,397,000 | 2,497,000 | 2,430,000 |
| Fund Balance Days Cash on Hand | 290 | 391 | 305 | 298 | 226 | 169 | 167 | 147 | 134 | 146 | 138 |
| Target Fund Balance = 120 days of Expenses | 2,505,000 | 1,862,000 | 2,109,000 | 2,012,000 | 2,197,000 | 2,246,000 | 2,107,000 | 2,148,000 | 2,140,000 | 2,048,000 | 2,119,000 |

### Summary Chart




### Water Utility Capital Investment

| Description | Total CIP | FY23 | FY24 | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Plant | 16,401,000 | 3,304,387 | 1,261,010 | 516,473 | 601,420 | 1,440,880 | 310,520 | 1,610,510 | 38,000 | - | 7,317,400 |
| Water Storage/Distribution | 17,629,000 | 5,348,637 | 2,207,385 | 518,047 | 8,898,080 | 480,610 | 35,820 | 45,510 | 46,870 | 48,280 | - |
| Total Water System CIP | 34,030,000 | 8,653,023 | 3,468,395 | 1,034,520 | 9,499,500 | 1,921,490 | 346,340 | 1,656,020 | 84,870 | 48,280 | 7,317,400 |