

Capital Region Water

Fiscal Year 2021 Water, Wastewater, and Stormwater Rate Study Report

Draft Report / December 2020

Table of Contents

1.	Introduction	1
1.1.	Rate Study Scope and Objectives	1
1.2.	Background	1
1.3.	Rate Study Process.....	2
1.3.1.	Water	2
1.3.2.	Wastewater	2
1.3.3.	Stormwater	2
2.	Water System Rate Evaluation	4
2.1.	Existing Water Rates.....	4
2.2.	Customer Growth	4
2.3.	Fiscal Requirements and Policies	5
2.3.1.	Cash Reserves	5
2.3.2.	Debt Service Coverage Requirements	7
2.4.	Revenues and Expenses	7
2.4.1.	Revenues	7
2.4.2.	Expenses	8
2.5.	Capital Project Funding	9
2.5.1.	Revenue Requirements	10
2.6.	Proposed Water Rates	11
2.6.1.	Existing Rate Structure	11
2.6.2.	Customer Bill Impacts	12
2.7.	Water System Cash Flow Projection	13
3.	Wastewater System Rate Evaluation	15
3.1.	Existing Wastewater Rates.....	15
3.2.	Customer Growth	17
3.3.	Fiscal Requirements and Policies	18
3.3.1.	Cash Reserves	18
3.3.2.	Debt Service Coverage	19

3.4.	Wastewater Revenues and Expenses	20
3.4.1.	Revenues	20
3.4.2.	Expenses	20
3.5.	Capital Project Funding	21
3.6.	Suburban Wholesale Wastewater Rate Calculation	23
3.6.1.	Cost Categorization	23
3.6.2.	Cost Allocation.....	26
3.6.3.	Wholesale Rate Calculation	28
3.7.	Wastewater System Retail Rate Revenue Requirements	29
3.8.	Proposed Retail and Wholesale Wastewater Rates	30
3.8.1.	Existing Rate Structure	30
3.9.	Retail Customer Bill Impacts.....	31
3.10.	Wastewater System Cash Flow Projection	31
4.	Stormwater Fee Evaluation	34
4.1.	Existing Stormwater Fees	34
4.2.	Stormwater Revenues and Expenses.....	35
4.2.1.	Revenues	35
4.2.2.	Expenses	35
4.3.	Capital Project Funding	36
4.4.	Stormwater System Revenue Requirements	37
4.5.	Proposed Stormwater Fees	38
4.6.	Stormwater System Cash Flow Projection	38
5.	Residential Bill Comparison	40
5.1.	Water Bill Comparison.....	40
5.2.	Wastewater Bill Comparison.....	41
5.3.	Stormwater Bill Comparison	42
6.	Conclusions and Recommendations	43
6.1.	Water System	43
6.2.	Wastewater System.....	43
6.3.	Stormwater System.....	44

List of Tables

Table 2-1. Existing (FY 2020) Water Rates.....	4
Table 2-2. O&M Cost Escalation Factors	8
Table 2-3. Water System Capital Plan	9
Table 2-4. Projected Water Rate Revenue Requirements	11
Table 2-5. Proposed FY 2021 Water Rates	12
Table 2-6. Water System Cash Flow Projection	14
Table 3-1. Existing (FY 2020) Retail and Wholesale Rates	15
Table 3-2. O&M Cost Escalation Factors	21
Table 3-3. FY 2021 Wastewater System Capital Plan	21
Table 3-4. Summary of Cost Categorization Results	24
Table 3-5. Summary of Projected City and Suburban Contributions to the Capital Reserve.....	26
Table 3-6. Customer Units of Service.....	26
Table 3-7. Historical CRW Water Consumption per Residential Account	27
Table 3-8. Allocation of Units of Service to Cost Driver Categories.....	27
Table 3-9. Unit Cost of Service.....	27
Table 3-10. Calculated Wholesale Rates (FY 2021).....	28
Table 3-11. Allocation of Revenue Requirements to Wholesale Customers	29
Table 3-12. Projected Wastewater Rate Revenue Requirements.....	30
Table 3-13. Proposed Retail and Wholesale Wastewater Rates.....	31
Table 3-14. Wastewater System Cash Flow Projection.....	33
Table 4-1. Existing (FY 2020) Stormwater Fees	35
Table 4-2. FY 2021 Stormwater System Capital Plan	36
Table 4-3. Projected Stormwater System Revenue Requirements	38
Table 4-4. Proposed Stormwater Fees	38
Table 4-5. Stormwater System Cash Flow Projection	39

List of Figures

Figure 2-1. Historical Accounts and Water Consumption	5
Figure 2-2. Capital Project Funding Sources	10
Figure 2-3. Residential (5/8") Water Bill Impact (FY 2021).....	13
Figure 3-1. Historical Billed Wastewater Volume (1,000 gal.).....	17
Figure 3-2. Capital Project Funding Sources	23
Figure 3-3. Retail Residential (5/8") Wastewater Bill Impact (FY 2021).....	31
Figure 4-1. Capital Project Funding Sources	37
Figure 5-1. Estimated Monthly Residential Water Bill Comparison.....	41
Figure 5-2. Estimated Monthly Residential Wastewater Bill Comparison	42
Figure 5-3. Survey of Annual Residential Stormwater Fees in PA	42

Appendix A

Wholesale Wastewater Rate Details

1. Introduction

1.1. Rate Study Scope and Objectives

This water and wastewater rate study report was prepared for Capital Region Water (“CRW”) for the purpose of reviewing and updating CRW’s water and wastewater rates for fiscal year (“FY”) 2021 and providing planning level estimates of rate increases in FY 2022 through FY 2025 (“the forecast period”). The rate study also includes a review of the sufficiency of CRW’s stormwater fees to meet the future revenue needs of its stormwater system. While the stormwater system is inter-connected to, and at times shares infrastructure with, CRW’s wastewater system, CRW budgets and accounts for stormwater system costs separately from wastewater system costs in order to better ensure that stormwater revenues properly recover its stormwater related costs.

CRW provides retail water service to customers located inside the City of Harrisburg (“City”) and in portions of municipalities located outside the City. It provides retail wastewater and stormwater management service to customers located within the City and wholesale wastewater treatment and conveyance service to several communities outside of the City. CRW’s fiscal year begins on January 1 of each year.

The specific objectives of this rate study included:

1. Identifying water system costs to be recovered from customers and recommending a rate revenue adjustment for FY 2021 and planning level adjustments for FY 2022 through FY 2025.
2. Calculating wastewater system costs to be recovered from City and Suburban customers and developing recommended retail and Suburban wholesale rates for FY 2021, and planning level retail and Suburban wholesale rates for FY 2022 through FY 2025.
3. Identifying stormwater system costs to be recovered from City customers and recommending a rate revenue adjustment for FY 2021 and planning level adjustments for FY 2022 through FY 2025.
4. Comparing CRW’s proposed FY 2021 water and wastewater rates, as well as the FY 2021 stormwater fees, with those of other utilities located within the region.

1.2. Background

CRW is a municipal authority that owns and manages the greater Harrisburg area’s water and wastewater systems and infrastructure. The water system includes a supply, treatment, and distribution system that serves approximately 20,100 accounts in Harrisburg (“the City”), the Borough of Penbrook, and parts of various outlying municipalities, including the Townships of Susquehanna and Lower Paxton. CRW’s water system also provides the water quantities and pressures needed to serve municipal fire hydrants and residential and commercial fire sprinkler systems.

The primary source of drinking water is the William T. DeHart Dam and Reservoir located 20 miles northeast of the City in the Clarks Valley Watershed. The Dam and Reservoir collect water from a watershed that is approximately 22 square miles. The Susquehanna River provides CRW with a backup water supply and is only used during severe drought or emergency. Raw water flows by gravity from the DeHart Reservoir and is treated at CRW’s Robert E. Young Water Services Center. The treatment facility is capable of producing up to 20 million gallons per day of drinking water. Treated water is pumped and held in three finished water storage reservoirs in Reservoir Park. The finished water storage reservoirs have a combined capacity of approximately 40 million gallons. In addition, the water system includes over 20 miles of 36 to 42-inch diameter transmission mains, 200 miles of distribution piping ranging from six to 36-inches in diameter, and more than 1,700 fire hydrants and 5,400 valves.

The wastewater system owned and operated by CRW includes an Advanced Wastewater Treatment Facility (“AWTF”), a conveyance system, and wastewater and stormwater collection systems located within the City limits. Overall, the wastewater system includes approximately 48 miles of sanitary sewers, and 87 miles of combined sanitary and stormwater sewers. The wastewater collection system provides service to customers located within the City. The conveyance and treatment systems provide wastewater conveyance and treatment services to both City and Suburban wholesale customers. Suburban wholesale customers include Susquehanna Township, Lower Paxton Township, Swatara Township, Paxtang Borough, Penbrook Borough, and Steelton Borough. The stormwater collection system consists of 29 miles of storm sewers located within the City of Harrisburg.

1.3. Rate Study Process

1.3.1. WATER

The proposed water rates were calculated by estimating the water system’s rate revenue requirement in FY 2021 and the remaining years of the forecast period and adjusting the water rates such that they generate sufficient revenues to match the annual rate revenue need and to comply with fiscal policies and financial covenants related to liquidity and debt service coverage.

1.3.2. WASTEWATER

The Suburban wholesale wastewater rates in FY 2021 and in the remaining years of the forecast period were determined by completing the following steps:

1. Estimating the combined (retail and wholesale) wastewater system rate revenue requirement for FY 2021 and beyond.
2. Allocating the annual rate revenue requirement to Treatment, Conveyance, Collection, and City-Only functions.
3. Calculating the Suburban customer’s cost responsibility in accordance with the intermunicipal agreement between the City and the Suburban customers, which involves dividing the Treatment and Conveyance related costs by the applicable units of service.

The City retail wastewater rates were developed for FY 2021 and all other years of the forecast period by estimating the wastewater system’s rate revenue requirement for each year, subtracting the revenue estimated to be received from Suburban wholesale customers in each year, plus any other non-rate revenues, and adjusting the retail wastewater rate such that they generate sufficient revenue to cover the annual revenue needs of the system and to comply with fiscal policies and financial covenants related to liquidity and debt service coverage over the forecast period.

1.3.3. STORMWATER

CRW implemented a stormwater fee on October 1, 2020 to recover costs associated with its stormwater regulatory requirements, which include a partial consent decree related to water quality issues from combined and separate sewer system discharges, a Municipal Separate Storm Sewer System permit that addresses stormwater requirements, and a total maximum daily load associated with Paxton Creek. Therefore, the FY 2021 wastewater budget provided by CRW excluded stormwater costs that have historically been included in the wastewater budget and recovered with CRW’s retail wastewater rates, as these costs will be recovered with the stormwater fee in FY 2021 and in all other years of the forecast period.

Section 4 of this report includes a general discussion of the type and amount of costs to be recovered with the stormwater fee, the annual fee revenue requirements of the stormwater system, and a cash flow forecast to highlight the system's key financial metrics over the forecast period.

The proposed stormwater rates were calculated by estimating the system's fee revenue requirement in FY 2021 and the remaining years of the forecast period and adjusting the fees such that they generate sufficient revenues to match the annual rate revenue need and to comply with fiscal policies and financial covenants related to liquidity and debt service coverage.

2. Water System Rate Evaluation

The water system rate evaluation was prepared in general accordance with “Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices M1,” published by the American Water Works Association. In this evaluation, water system rate revenue requirements were estimated for each year of the forecast period and revenues from the existing retail water rates were projected and compared to the rate revenue requirement to assess the need for any water rate adjustments. The water system rate revenue requirements were prepared using the industry accepted and practiced cash-needs approach. The objective of the cash-needs approach is to provide revenues sufficient to recover the total cash requirements of the water system in each year of the forecast period.

2.1. Existing Water Rates

CRW’s existing water rate structure consists of a fixed charge and a uniform volumetric rate. The fixed charge, known as the Ready to Serve Charge, is billed on a monthly basis and varies by meter size. The volumetric rate is the same for all customers. The existing rate structure generates approximately 31 percent of the system’s total rate revenue from the Ready to Serve Charge and approximately 69 percent from the volumetric rate. The existing (FY 2020) water rates are shown in Table 2-1.

Table 2-1. Existing (FY 2020) Water Rates

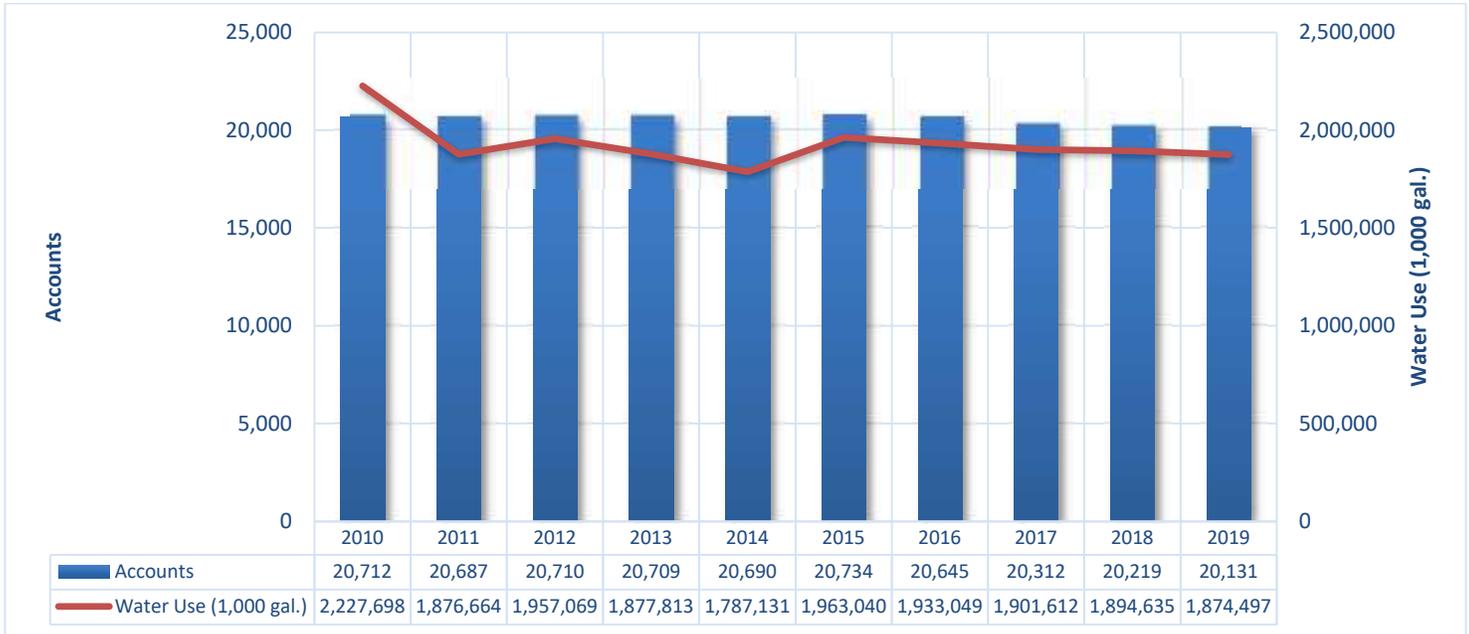
Ready to Serve Charge	
Meter Size	Cost per Month
5/8”	\$7.77
3/4”	\$16.83
1”	\$33.76
1-1/2”	\$72.33
2”	\$132.60
3”	\$370.67
4”	\$662.97
6”	\$1,789
8”	\$3,182
10”	\$4,496
12”	\$7,160
Volumetric Rate	
Consumption	Cost per 1,000 gal.
All	\$9.84

2.2. Customer Growth

The projection of water rate revenues was derived from anticipated water rates in future years and assumptions regarding future changes in customer accounts and billed consumption. An analysis of recent historical changes in water accounts and billed consumption was completed, and along with discussions with CRW management, was used to help provide an estimate of future changes in customer growth over the forecast period. The historical number of water accounts and volume of billed consumption over the last ten fiscal years, from FY 2010 to FY 2019, is shown in Figure 2-1.

As shown in the figure, in FY 2015, billed water consumption increased relative to prior years, which was likely due to CRW’s meter repair and replacement work, as older customer meters were repaired or replaced with newer and more accurate meters. From FY 2015 through FY 2019, total billed water consumption declined by approximately 1.1 percent per year, while the number of accounts declined by about 0.7 percent per year.

Figure 2-1. Historical Accounts and Water Consumption



Based on the historical trends shown in Figure 2-1 and discussions with CRW (CRW expects no significant changes to the customer base over the forecast period), Ready to Serve Charge revenues were projected to remain unchanged over the forecast period.

While in previous rate study reports, billed consumption was assumed to remain unchanged from year-to-year over the forecast period, a 2.0 percent decline in billed consumption in FY 2021, as compared to 2020, was incorporated into the forecast at the request of CRW to reflect the continued economic impact of COVID-19 within the service area during the upcoming fiscal year. Increases of roughly 1.0 percent per year to billed consumption were incorporated into the forecast in FY 2022 and FY 2023 to restore billed consumption in FY 2023 to the level originally forecasted in FY 2021. Billed consumption was projected to remain unchanged over the remaining years of the forecast period based on historical trends and discussions with CRW.

2.3. Fiscal Requirements and Policies

2.3.1. CASH RESERVES

2.3.1.1. Operating Cash Reserves

Water and wastewater utilities commonly maintain operating reserves to meet unexpected operating costs, such as those related to unplanned minor repairs and maintenance, serve as a source of working capital to address timing differences between cash inflows and outflows, and act as a buffer against revenue shortfalls resulting from weather related declines in water usage, unforeseen economic influences, or fiscal emergencies. CRW has covenanted to maintain a specified level of operating reserves according to the terms of the existing Trust Indenture between CRW and the Bank of New York Mellon Trust Company, originally dated January 1, 1991 and as amended and

restated (“Water Trust Indenture”),¹ and elects to hold additional reserves above the minimum level specified in the Water Trust Indenture as an internal fiscal policy target.

Operating Reserve Account:

The reserves required to be maintained under the Water Trust Indenture are held within the Operating Reserve Account. The purpose of this account is to pay for unanticipated operating expenses and to cover expenditures when current revenues are insufficient. The Water Trust Indenture states that CRW shall maintain a balance in this account equal to at least 60 days (one sixth) of budgeted operating expenses for the current fiscal year. As of September 2020, the balance in this account was approximately \$1.7 million, which is equivalent to about 64 days cash on-hand for FY 2021.

Total Combined Operating Cash Reserve Levels:

In addition, CRW has established a cash management target of maintaining a total operating reserve, including amounts in the Operating Reserve Account, at a minimum of 200 days of annual operating expenses. This level of reserves is customary within the industry for water utilities with strong credit ratings. Given that CRW is required to maintain an operating reserve of 60 days of operating expenses per the Water Trust Indenture, an additional cash reserve level within the Revenue Fund equal to at least 140 days of operating expenses was included as a minimum operating cash target for the system. This amount, combined with funds held separately in the Operating Reserve Account, provides CRW with a minimum of a 200-day operating cash reserve.

In recent years, CRW has maintained total operating cash reserves at a level well above its minimum target. Specifically, as of the beginning of FY 2021, actual operating cash on-hand, which includes amounts held in the Revenue Fund and excludes amounts held in the Operating Reserve Account, was expected to be approximately \$12.2 million. With budgeted operating expenses for FY 2021 totaling about \$9.5 million, this equates to roughly 461 days cash on-hand. Therefore, the beginning level of operating cash in the Revenue Fund in FY 2021 is anticipated to significantly exceed CRW’s minimum operating cash reserve target for the fund.

2.3.1.2. Conservation Easement Proceeds

CRW recently entered into a partnership with the Ward Burton Wildlife Foundation, the Nature Conservancy, and the Fort Indiantown Gap to conserve its 8,200-acre DeHart Watershed Property. Under the partnership, CRW has received approximately \$9.2 million through the Fort Indiantown Gap Army Compatible Use Buffer program to grant a conservation easement limiting development on the property. The Nature Conservancy has held and enforces the easement in perpetuity. However, CRW has retained all rights to manage the drinking water system, including the DeHart Reservoir, DeHart Dam, and all associated facilities and structures. Monies received as a result of this arrangement totaled approximately \$9.2 million, with roughly \$9.0 million on-hand as of September 2020. There are no legal or formal restrictions on the future use of these funds; however, CRW has elected to use these monies to fund future construction projects at the DeHart Dam in FY 2022 and FY 2023.

2.3.1.3. Contingency Cash Reserve

As part of the Water Trust Indenture, CRW has also covenanted to maintain a Contingency Account. The Contingency Account is a residual account comprised of funds remaining in the Water Revenue Fund after the transfers required under the Water Trust Indenture have been made. These funds are to be used as payments for capital additions or for any other purpose relating solely to the water system, as may be designated by resolution of CRW. As of September 2020, the balance in this account was approximately \$3.3 million.

¹ Amended and Restated Trust Indenture, originally dated as of January 1, 1991, between CRW and the Bank of New York Mellon Trust Company, N.A., amended and restated as of April 1 2014 and May 1, 2018, and supplemented by a First, Second, and Third Supplemental Trust Indenture.

2.3.2. DEBT SERVICE COVERAGE REQUIREMENTS

Debt service coverage is the amount of net operating revenue (operating revenue, less operating expenditures) available to fund annual principal and interest payments on outstanding debt. Water and wastewater utilities typically set rates such that the resulting net revenues provide a margin of coverage over and above the utility's annual debt service obligations. Currently, CRW's outstanding debt related to the water system is comprised of the Series 2016A Revenue Refunding Bonds, the Series 2018 Revenue Bonds, and a loan with the Pennsylvania Infrastructure Investment Authority ("PENNVEST"). The required level of debt service coverage associated with CRW's outstanding debt is described in the Water Trust Indenture and is summarized below.

"The Authority covenants that: (a) it has adopted and will charge, maintain and collect throughout its service area so long as any Bonds remain Outstanding and funds for their payment have not been provided, service rates, rents and other charges, which (after making due and reasonable allowances for prompt payment discounts, if any, contingencies and a margin of error in the estimates), shall generate Net Revenues (exclusive of Assessment Revenues, including connection and tapping fees, which shall constitute Gross Revenues) which shall be sufficient in each Fiscal Year to provide funds to pay (1) an amount not less than 120% of the Debt Service Requirements with respect to its Outstanding Bonds in such Fiscal Year, (2) any amount required to replenish the Debt Service Reserve Fund in full and (3) the amount due in such Fiscal Year on all Subordinated Debt. For purposes of this covenant, Net Revenues may be increased as a result of any transfers from the Rate Stabilization Fund to the Water Revenue Fund and shall be decreased as a result of any transfers from the Contingency Account to the Rate Stabilization Fund in any Fiscal Year, subject to the limitations set forth in Section 6.08;"

CRW has established a management target for debt service coverage that is more restrictive than the bond covenant. The target consists of maintaining debt service coverage at a level of 1.45 times or greater with respect to annual debt service payments associated with the current and future outstanding senior lien debt of the system. Senior lien debt includes CRW's current and future Revenue Bond debt and PENNVEST loans.

2.4. Revenues and Expenses

2.4.1. REVENUES

CRW's water system revenues include revenue from its Ready-to-Serve Charges, the sale of water, and from other miscellaneous sources. Water revenues also include sales to customers on a retail basis, as well as revenues from the Lancaster County Solid Waste Management Authority ("LCSWMA") under a negotiated rate. The majority of water billed to LCSWMA is subject to the negotiated rate of \$4.70 per 1,000 gallons, based on a recent amendment to the Effluent Water Reuse System Agreement between CRW and LCSWMA (LCSWMA will continue to pay Ready-to-Serve Charges related to water meters at its location, and will also continue to receive about 100,000 gallons per year from CRW at the retail water rate for regular domestic purposes). Therefore, anticipated revenue from LCSWMA of approximately \$750,000 was budgeted in FY 2021 and then projected separately from rate revenues.

Miscellaneous revenues are largely generated from private fire protection charges, penalties on past due accounts, timber sales, lease income, and interest income. Historically, miscellaneous revenues have comprised approximately 5.0 to 10 percent of the total revenue of the system. With the exception of interest income, these revenues were projected in future years based on their FY 2021 budgeted amounts, as provided by CRW. Interest income was estimated based on the average annual balance of available cash associated with the water system and an interest earnings rate of approximately 0.75 percent per year.

A summary of the historical and projected water system revenues is provided at the end of this section in Table 2-6. Note that no adjustments were made to revenues received from late payment penalties or any other miscellaneous revenues in FY 2021 or in future years in response to continued COVID-19 impacts. With the exception of any

unforeseen circumstances, CRW expects miscellaneous revenues to be realized in FY 2021 and in future years at the levels budgeted and projected based on the information available as of the date of this report.

2.4.2. EXPENSES

2.4.2.1. Operation and Maintenance Expenses

The projection of water system operation and maintenance (“O&M”) expenses was prepared based in part on adopted budget figures for FY 2021, as provided by CRW. In general, O&M expenses are comprised of costs related to personnel, insurance, electricity, chemicals, parts and supplies, engineering services, and general operating costs. O&M expenses also include administrative costs of CRW attributable to the water system, which were anticipated to total approximately \$3.1 million in FY 2021. Individual O&M expenses were classified as labor, benefits, insurance, electricity, chemicals, professional services, minor capital, or general and were escalated in future years based on their FY 2021 budget amount and an appropriate cost escalation factor. The escalation factors for each of the expense classifications are provided in Table 2-2 and were developed based on discussions with CRW management. A summary of historical and projected annual O&M expenses is provided at the end of this section in Table 2-6.

Note that while billed consumption was adjusted downward in FY 2021 to account for reduced water demand in response to the continued impact of COVID-19, no additional adjustments were made to the system’s variable operating costs, such as electricity, chemicals, and sewerage in this year. Expenses to be incurred within these line items were budgeted by CRW to account for the projected decrease in billed consumption in FY 2021.

Table 2-2. O&M Cost Escalation Factors

Expense Category	Annual Escalation Rate
Labor	3.0%
Benefits	6.0%
Insurance	3.0%
Electricity	4.0%
Chemicals	4.0%
Professional Services	5.0%
Minor Capital/Equipment	3.0%
General	2.8%

2.4.2.2. Capital Expenditures

The projection of water system capital expenditures was prepared based on a detailed schedule of future capital project costs provided by CRW. Future projects were mainly related to raw water supply and transmission, treatment, finished water transmission, distribution, and meter replacements. Project costs in each year of the forecast are summarized in Table 2-3. Note that project costs in FY 2022 through FY 2025 were escalated to future year dollars at a rate of 3.0 percent per year to adjust for expected construction cost inflation. Furthermore, the capital plan in the years beyond FY 2021 continue to be a work in progress and it is possible that project cost amounts may change as CRW continues to refine its capital plan for these years.

Table 2-3. Water System Capital Plan

Project Type	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Raw Water Supply	\$1,234,000	\$5,300,000	\$10,506,000	\$5,357,545	\$270,996
Raw Water Transmission	615,000	155,000	77,250	79,568	81,955
Water Treatment	2,387,700	855,000	427,450	175,049	327,818
Transmission / Distribution	8,523,000	11,403,000	4,274,778	4,675,193	4,560,663
Meter Replacements	231,000	2,500,000	2,575,000	2,652,250	0
Miscellaneous	641,500	150,000	206,000	1,060,900	218,546
Total	\$13,632,200	\$20,363,000	\$18,066,478	\$14,000,504	\$5,459,978

Note: Capital project costs shown in this table were provided in 2021 dollars and then escalated at a rate of 3.0 percent per year in future years for financial planning purposes.

2.5. Capital Project Funding

The financial forecast assumed funding of water capital project costs with a mix of cash, existing bond proceeds, and new debt. The sources of cash included current revenues, amounts held in reserve within the Revenue Fund, and conservation easement monies. It was assumed that cash reserves in the Operating Reserve Account and Contingency Account would not be used to fund capital projects over the forecast period. This capital funding and financing plan scenario was prepared and provided by CRW for scenario analysis only and should not be considered by CRW to be municipal securities advice. The financing assumptions employed should be discussed with CRW’s registered municipal advisor prior to CRW taking any action.²

A summary of CRW’s anticipated capital funding and financing plan is shown in Figure 2-2 and assumes capital projects will be funded and financed with cash (current revenues, reserves, and conservation easement monies), existing bond proceeds, and a new PENNVEST loan. Over the forecast period, cash (current revenues, plus reserves, plus conservation easement monies) was assumed to be used to fund approximately 53.6 percent of the capital project costs, while existing bond proceeds (0.6 percent) and the new PENNVEST programmatic financing (“Pro-Fi”) loan (45.8 percent) were assumed to be used to fund the remaining 46.4 percent. Cash reserves from the Revenue Fund were assumed to be used to fund about \$2.1 million, or roughly 2.9 percent, of total project costs over the forecast period. Note that the PENNVEST Pro-Fi loan was assumed to be used to fund project costs over a four-year period from FY 2021 through FY 2024.

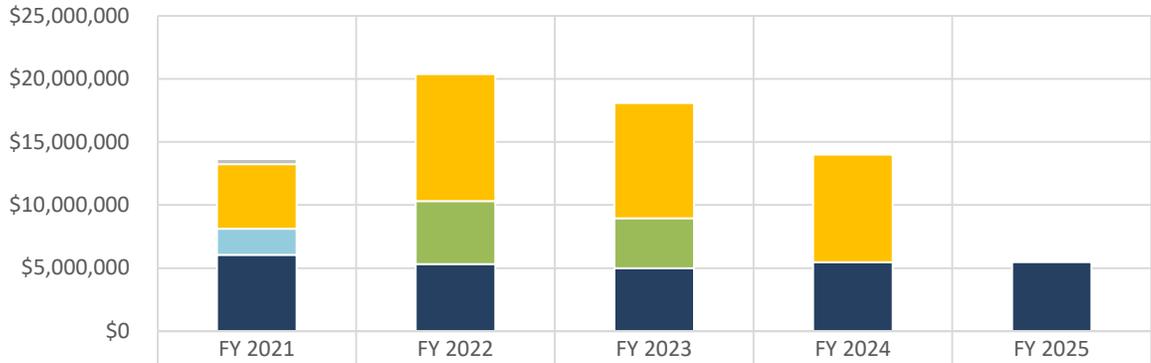
The following paragraphs provide assumptions and other information about the new PENNVEST Pro-Fi loan anticipated by CRW to be used as a future capital funding source:

PENNVEST Pro-Fi Loan:

-) The PENNVEST Pro-Fi loan was assumed with interest-only payments in FY 2021 through FY 2024, with interest payments accruing based on the projected cost of the projects to be funded by the loan in those years and an annual interest rate of 1.0 percent. Other assumptions included issuance costs of 0.85 percent, a repayment term of 20 years, and level annual debt service payments over the repayment period. With the loan expected to begin amortizing in FY 2025, future annual debt service payments were projected to be about \$1.8 million per year. The loan was assumed to hold a subordinate claim to the net revenues of the system.

² With meaning of municipal advisor to be as defined by the Securities Exchange Act of 1934 Rule 15Ba1-1(d)(3)vi.

Figure 2-2. Capital Project Funding Sources



	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Existing Bond Proceeds	\$407,000	\$0	\$0	\$0	\$0
New PENNVEST Loan	\$5,100,000	\$10,050,000	\$9,108,675	\$8,540,245	\$0
Cash - Easement Proceeds	\$0	\$5,000,000	\$3,972,325	\$0	\$0
Cash - Rev Fund Reserves	\$2,084,395	\$0	\$0	\$0	\$0
Cash - Current Revenues	\$6,040,805	\$5,313,000	\$4,985,478	\$5,460,259	\$5,459,978
Total - All Sources	\$13,632,200	\$20,363,000	\$18,066,478	\$14,000,504	\$5,459,978

2.5.1. REVENUE REQUIREMENTS

A summary of the estimated annual water system rate revenue requirements from FY 2021 through FY 2025 are shown in Table 2-4. The rate revenue requirements include O&M expenses, minor capital outlays, debt service, and cash-funded capital project costs. Non-rate revenues were subtracted from the total revenue requirements in order to estimate the rate revenue requirement to be generated from water rate revenues. The Sources and Uses of Funds amount (Line 12) represents the use of cash reserves to fund capital project costs (when negative), and the accumulation of cash to be carried over into future years (when positive).

As shown in Table 2-4, a rate revenue adjustment of 2.0 percent is recommended in FY 2021 to generate sufficient rate revenue to fund the rate revenue requirement. In addition, rate revenue adjustments of 2.0 percent per year are projected in the remaining years of the forecast period. Note that the projection of rate increases in FY 2022 through FY 2025 are planning level adjustments only and are subject to change in the future.

Table 2-4. Projected Water Rate Revenue Requirements

Line No.	Description	Fiscal Year Ending December 31				
		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
O&M Expenses and Transfers						
1	Operating and Maintenance Expenses	\$ 9,522,722	\$ 9,852,907	\$ 10,195,945	\$ 10,543,076	\$ 10,903,318
2	Minor Capital	275,026	283,277	291,775	300,528	309,544
3	Transfer to Operating Reserve Account	-	55,656	59,314	61,543	63,866
4	Total O&M and Transfers Out	\$ 9,797,748	\$ 10,191,840	\$ 10,547,034	\$ 10,905,147	\$ 11,276,728
Capital Expenditures						
5	Debt Service	\$ 11,039,549	\$ 11,138,799	\$ 11,233,386	\$ 10,901,038	\$ 11,267,311
6	Cash Funded Capital	8,125,200	5,313,000	4,985,478	5,460,259	5,459,978
7	Total Capital Expenditures	\$ 19,164,749	\$ 16,451,799	\$ 16,218,864	\$ 16,361,297	\$ 16,727,288
8	Total O&M, Transfers Out, and Capital	\$ 28,962,497	\$ 26,643,639	\$ 26,765,898	\$ 27,266,445	\$ 28,004,017
Less Non-Rate Revenues						
9	Miscellaneous Revenue	\$ (1,771,522)	\$ (1,771,522)	\$ (1,771,522)	\$ (1,771,522)	\$ (1,771,522)
10	LCSWMA Revenue	(750,000)	(750,000)	(750,000)	(750,000)	(750,000)
11	Interest Revenue	(81,450)	(78,915)	(87,698)	(98,681)	(108,983)
12	Sources and Uses of Funds	(2,084,395)	892,643	1,458,417	1,481,155	1,276,433
13	Total Non-Rate Revenues	\$ (4,687,367)	\$ (1,707,794)	\$ (1,150,803)	\$ (1,139,047)	\$ (1,354,071)
14	Rate Revenue Requirement	\$ 24,275,129	\$ 24,935,845	\$ 25,615,095	\$ 26,127,397	\$ 26,649,945
15	Proposed Rate Increase	2.0%	2.0%	2.0%	2.0%	2.0%

2.6. Proposed Water Rates

2.6.1. EXISTING RATE STRUCTURE

CRW’s proposed water rates for FY 2021 through FY 2025 were developed by applying the proposed annual water rate increases proportionally to both the existing (FY 2020) Ready to Serve Charges and the Volumetric Rate. The proposed water rates for FY 2021 through FY 2025 are shown in Table 2-5. The current rate structure is expected to generate approximately 30 percent of rate revenue from the Ready to Serve Charge and approximately 70 percent from the Volumetric Rate each year over the forecast period.

Table 2-5. Proposed FY 2021 Water Rates

Ready to Serve Charge (Cost per Month)						
Meter Size	Existing FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
5/8"	\$7.77	\$7.93	\$8.08	\$8.25	\$8.41	\$8.58
3/4"	\$16.83	\$17.17	\$17.51	\$17.86	\$18.22	\$18.58
1"	\$33.76	\$34.44	\$35.12	\$35.83	\$36.54	\$37.27
1-1/2"	\$72.33	\$73.78	\$75.25	\$76.76	\$78.29	\$79.86
2"	\$132.60	\$135.25	\$137.96	\$140.72	\$143.53	\$146.40
3"	\$370.67	\$378.08	\$385.65	\$393.36	\$401.23	\$409.25
4"	\$662.97	\$676.23	\$689.75	\$703.55	\$717.62	\$731.97
6"	\$1,789	\$1,825	\$1,861	\$1,899	\$1,936	\$1,975
8"	\$3,182	\$3,246	\$3,311	\$3,377	\$3,444	\$3,513
10"	\$4,496	\$4,586	\$4,678	\$4,771	\$4,867	\$4,964
12"	\$7,160	\$7,303	\$7,449	\$7,598	\$7,750	\$7,905

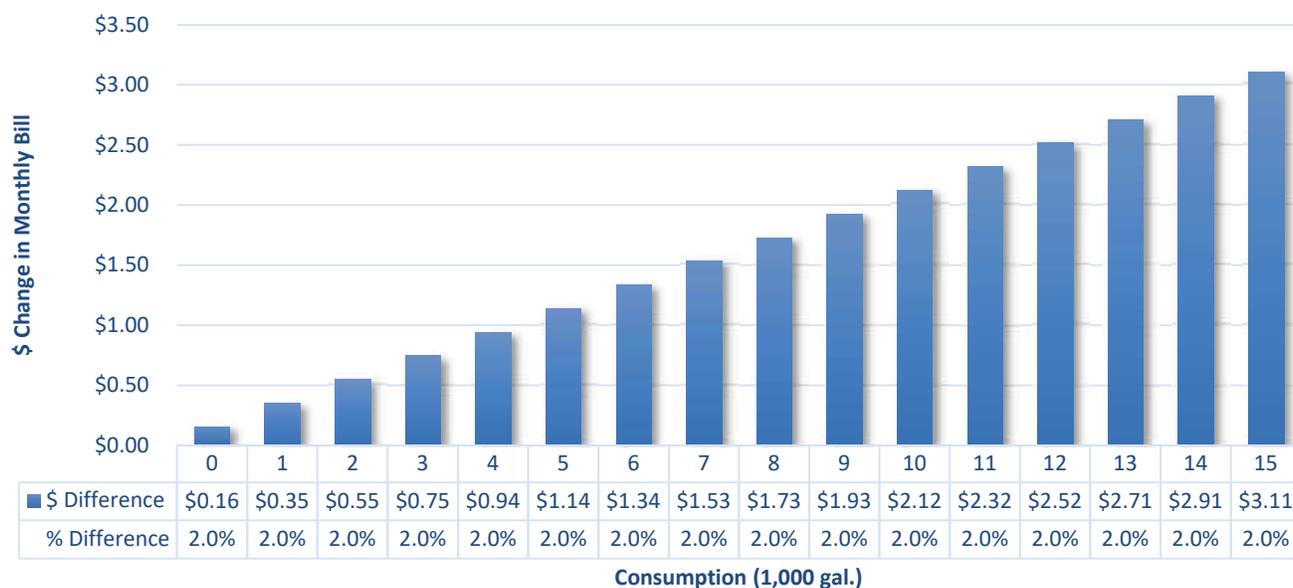
Volumetric Rate (per 1,000 gal.)						
Consumption	Existing FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
All	\$9.84	\$10.04	\$10.24	\$10.44	\$10.65	\$10.86

2.6.2. CUSTOMER BILL IMPACTS

Anticipated residential water customer bill impacts for FY 2021 are provided in Figure 2-3. The bill impacts shown in the figure result from the rates projected in Table 2-5 in FY 2021, as compared to the existing FY 2020 water rates.

The bill impacts are provided across a range of consumption levels and assume use of a 5/8-inch meter. As shown in Figure 2-3, a residential customer using between 3,000 - 4,000 gallons of water per month would experience an increase in their water bill of between \$0.75 to \$0.94, or 2.0 percent, per month, as compared to the existing (FY 2020) water rates. Note that while the dollar increase in the monthly bill amount becomes larger as the level of consumption rises, the percentage increase to a customer's bill remains the same across all levels of consumption, at 2.0 percent.

Figure 2-3. Residential (5/8”) Water Bill Impact (FY 2021)



2.7. Water System Cash Flow Projection

A cash flow forecast showing the projected cash revenues and expenses of the water system from FY 2021 through FY 2025 is shown in Table 2-6 and reflects the recommended rate revenue increases shown in Table 2-4. As shown in the forecast, unrestricted cash is anticipated to be maintained at a level of at least 140 days of operating expenses (Line 34). Furthermore, the cash balance in the Operating Reserve Account is anticipated to be maintained separately at a level equal to at least 60 days of operating expenses; therefore, in total, it is anticipated that CRW will maintain unrestricted cash reserves of at least 200 days of O&M expenses over the forecast period (at least 140 days, as shown on Line 34, plus at least 60 days held separately in the Operating Reserve Account). This amount is in addition to the cash held within the Contingency Account. Combining all cash, including cash held in the Revenue Fund and as conservation easement monies, as well as amounts held in the Operating Reserve Account and Contingency Account, it is estimated that CRW will maintain total cash reserves of between 612 and 910 days of cash over the forecast period.

Projected debt service coverage levels are also shown in Table 2-6 (Lines 37-38). Net revenues are anticipated to be 1.54 times senior lien debt service in FY 2021, which is higher than the coverage requirement of 1.20, as stated in the Water Trust Indenture, and CRW’s management target of 1.45. Coverage levels associated with senior lien debt are projected to be at least 1.45 times annual debt service in each of the remaining years of the forecast period.

Table 2-6. Water System Cash Flow Projection

Line No.	Description	Actual	Budget	Projected	Fiscal Year Ending December 31				
		FY 2019	FY 2020	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Revenues									
1	Sales to Customers	\$ 23,596,107	\$ 24,137,356	\$ 23,124,552	\$ 24,275,129	\$ 24,935,845	\$ 25,615,095	\$ 26,127,397	\$ 26,649,945
2	Sales to LCSWMA	750,607	736,000	772,305	750,000	750,000	750,000	750,000	750,000
3	Penalties	629,350	500,000	275,899	500,000	500,000	500,000	500,000	500,000
4	Private Fire Protection Service	320,089	320,000	311,200	311,200	311,200	311,200	311,200	311,200
5	Interest Income	308,586	222,822	124,250	81,450	78,915	87,698	98,681	108,983
6	Interest Income - DSRF	238,726	239,000	53,382	55,000	55,000	55,000	55,000	55,000
7	Other Revenue	916,648	742,000	1,148,030	905,322	905,322	905,322	905,322	905,322
8	Total Revenues	\$ 26,760,112	\$ 26,897,178	\$ 25,809,618	\$ 26,878,101	\$ 27,536,282	\$ 28,224,316	\$ 28,747,600	\$ 29,280,450
Operating Expenses									
<i>Personnel:</i>									
9	Management	\$ 625,893	\$ 643,498	\$ 591,420	\$ 658,546	\$ 684,157	\$ 710,887	\$ 738,792	\$ 767,928
10	Distribution	1,074,851	1,180,821	1,144,245	1,183,171	1,228,608	1,276,005	1,325,455	1,377,060
11	Treatment	1,406,246	1,487,939	1,412,937	1,515,478	1,572,442	1,631,804	1,693,679	1,758,185
12	Other	(33,344)	100,000	36,671	100,000	106,000	112,360	119,102	126,248
<i>Operations:</i>									
13	Management	\$ 408,344	\$ 501,829	\$ 437,619	\$ 517,926	\$ 533,158	\$ 548,838	\$ 564,979	\$ 581,596
14	Distribution	261,866	161,725	264,846	304,843	313,379	322,153	331,173	340,446
15	Treatment	1,229,501	1,282,192	1,117,900	1,335,927	1,393,293	1,453,381	1,507,008	1,562,749
16	Other	182,571	391,787	262,233	518,225	532,619	547,508	562,911	578,847
<i>Other Operating Expenses:</i>									
17	CRW Administrative Fund Expense	\$ 2,778,510	\$ 3,097,714	\$ 2,772,399	\$ 3,085,509	\$ 3,171,903	\$ 3,260,717	\$ 3,352,017	\$ 3,445,873
18	Minor Capital Outlay	280,716	412,800	374,598	312,623	322,002	331,662	341,612	351,860
19	Engineering Services	219,331	280,000	276,518	262,500	275,625	289,406	303,877	319,070
20	Transfers to Operating Reserve Account	-	-	-	-	55,656	59,314	61,543	63,866
21	CRW Bank and Trustee Fees	3,000	3,000	2,649	3,000	3,000	3,000	3,000	3,000
22	Total Operating Expenses	\$ 8,437,485	\$ 9,543,305	\$ 8,694,033	\$ 9,797,748	\$ 10,191,840	\$ 10,547,034	\$ 10,905,147	\$ 11,276,728
Debt Service									
<i>Existing Debt Service:</i>									
23	Rev Ref Bonds, Series A of 2016	\$ 7,714,000	\$ 7,716,000	\$ 7,716,000	\$ 7,713,500	\$ 7,712,250	\$ 7,715,750	\$ 7,298,000	\$ 299,250
24	Rev Bonds, Series of 2018	2,966,000	2,966,000	2,966,000	2,966,000	2,966,000	2,966,000	2,966,000	8,826,000
25	2015 PENNVEST Loan	309,049	309,049	309,049	309,049	309,049	309,049	309,049	309,049
<i>New Debt Service:</i>									
26	PENNVEST Pro-Fi Loan	-	-	-	51,000	151,500	242,587	327,989	1,833,012
27	Total Debt Service	\$ 10,989,049	\$ 10,991,049	\$ 10,991,049	\$ 11,039,549	\$ 11,138,799	\$ 11,233,386	\$ 10,901,038	\$ 11,267,311
28	Capital Projects Funded with Cash	\$ 7,487,526	\$ 9,037,000	\$ 6,084,000	\$ 8,125,200	\$ 5,313,000	\$ 4,985,478	\$ 5,460,259	\$ 5,459,978
29	Total Revenue Requirements	\$ 26,914,060	\$ 29,571,354	\$ 25,769,082	\$ 28,962,497	\$ 26,643,639	\$ 26,765,898	\$ 27,266,445	\$ 28,004,017
30	Revenues Over (Under) Expenditures	\$ (153,947)	\$ (2,674,176)	\$ 40,535	\$ (2,084,395)	\$ 892,643	\$ 1,458,417	\$ 1,481,155	\$ 1,276,433
31	Beginning Cash Balance				\$ 12,199,510	\$ 10,115,115	\$ 11,007,757	\$ 12,466,175	\$ 13,947,330
32	Revenues Over (Under) Expenditures				(2,084,395)	892,643	1,458,417	1,481,155	1,276,433
33	Ending Cash Balance¹				\$ 10,115,115	\$ 11,007,757	\$ 12,466,175	\$ 13,947,330	\$ 15,223,763
34	Ending Balance - Days O&M				382	400	438	473	500
35	Target Reserve Balance (140 days O&M)				\$ 3,703,281	\$ 3,831,686	\$ 3,965,090	\$ 4,100,085	\$ 4,240,179
36	Projected City Rate Increase				2.0%	2.0%	2.0%	2.0%	2.0%
37	DSC (Senior debt, 1.45x Mgmt DS target)				1.55	1.57	1.60	1.68	1.90
38	DSC (All debt, 1.15x Mgmt DS target)				1.54	1.55	1.57	1.63	1.59
39	Capital Projects - Cash Funded				\$ 8,125,200	\$ 5,313,000	\$ 4,985,478	\$ 5,460,259	\$ 5,459,978
40	Capital Projects - Conservation Easement Proceeds				-	5,000,000	3,972,325	-	-
41	Capital Projects - Existing Bond Proceeds				407,000	-	-	-	-
42	Capital Projects - Funded with PENNVEST Pro-Fi Loan				5,100,000	10,050,000	9,108,675	8,540,245	-
43	Capital Projects - Total				\$ 13,632,200	\$ 20,363,000	\$ 18,066,478	\$ 14,000,504	\$ 5,459,978

¹Excludes cash held in the Operating Reserve Account and Contingency Account, as well as conservation easement monies.

3. Wastewater System Rate Evaluation

The wastewater system rate evaluation was prepared in general accordance with “Financing and Charges for Wastewater Systems, Manual of Practice 27,” as published by the Water Environment Federation, and the rate calculation for the Suburban municipalities was prepared in accordance with the intermunicipal agreement (“IMA”) between CRW and the Suburban wholesale municipalities.³ An estimate of wastewater system rate revenue requirements was made for each year of the forecast period and the revenue requirement was proportioned to City retail and Suburban wholesale customers to estimate their cost responsibility and to calculate retail and wholesale rates. City retail wastewater rates were calculated based on the City retail rate revenue requirement, which was prepared using the industry accepted and practiced cash-needs approach. The objective of the cash-needs approach is to provide revenues sufficient to recover the total cash requirements of the wastewater system in each year of the forecast period.

3.1. Existing Wastewater Rates

CRW’s existing wastewater rate structure is comprised of volumetric rates that differ based on service area, level of service provided, and the results of a cost of service evaluation. Customers located within the City pay for retail wastewater service, while the six Suburban municipalities served by CRW pay for wholesale wastewater service. The rates differ based on the service being provided by CRW. For example, customers located within the City utilize CRW’s treatment, conveyance, and collection systems and their rates reflect their proportionate share of the cost of operating and maintaining these facilities. However, the Suburban municipalities located outside the City operate their own collection systems and primarily utilize CRW’s treatment and conveyance facilities. Therefore, the wastewater rates paid by these communities exclude costs attributable to CRW’s collection system, except for a small number of Suburban connections whose wastewater flows through CRW’s collection system.

The Borough of Steelton operates its own collection and conveyance systems, and discharges wastewater directly to CRW’s AWTF. Therefore, the wholesale cost of service for Steelton is different than the other Suburban municipalities, as Steelton’s only reflects its proportionate share of the costs associated with the use of CRW’s treatment facilities. The existing (FY 2020) wastewater rates for all customers are provided in Table 3-1.

Table 3-1. Existing (FY 2020) Retail and Wholesale Rates

Customer Class	Cost per 1,000 gal.
Retail Customers:	
All	\$7.99
Wholesale Customers:	
Suburban	\$4.47
Steelton	\$3.28

The IMA contains pricing provisions that specify how the wholesale rates are established. A summary of the pertinent sections of the IMA is provided below. References to the City in the excerpt below should be read as CRW.

³ Second Supplemental Agreement between the City of Harrisburg, Harrisburg Sewerage Authority, Borough of Penbrook, Borough of Paxtang, Township of Swatara, Township of Susquehanna, and the Township of Lower Paxton, dated September 15, 1976.

5.02. Each Municipality agrees to pay the City for sewage transport, treatment, and disposal services rendered by the City with respect to sewage and wastes emanating from each such Municipality...in accordance with Schedule A of the Agreement.

5.03. Each Municipality agrees to pay to the City for each Industrial Establishment, a surcharge for pollutant load for all sewage and waste discharged to the Harrisburg Facilities and emanating from or containing a pollutant load of such strength character as to be classified as "high strength" by application of generally accepted engineering principles, or provisions of any Grant Agreement, or any state or federal law or regulation, which surcharge shall be determined by the City.

5.04. ...City agrees to deliver to each Municipality, a statement of any adjustments to the rates and charges for the next calendar year no later than December 1 of any year. The City will cause its Consulting Engineers to prepare and deliver to it no later than October 1 of each year, a report which shall include estimates of Operating Expenses, and other expenditures, costs, revenues, and changes to the rates for the next calendar year.

5.06. Each Municipality covenants to pay all taxes and assessments including income, profits, property, franchise, excise, and/or other taxes levied or assessed by Federal, State or any municipal government against the City upon or by reason of payment or receipt of any sums payable by such Municipality hereunder to the City.

6.02. Each of the Joint Municipalities agrees to pay to the City for sewage transportation, treatment, and disposal, the following separate and distinct charges for customers of any of the Joint Municipalities discharging sewage and wastes to City sewer collection lines referred to in Section 6.01:.

A. An amount equal to the amount charged per customer for sewage and wastes discharged through the Harrisburg Conveyance System; and

B. An amount equal to the separate amount charged per customer in the City as a sewer maintenance charge (as distinguished from sewer treatment charge).

6.07. If the City during the term hereof shall incur extra-ordinary costs in repairs to or in replacement of that part of its sewer lines governed by Article VI, to which sewage and wastes are discharged by one or more of the Joint Municipalities, any such Joint Municipality using that part of the sewer lines shall pay to the City such increased annual fees as are adequate to compensate the City for such additional costs...

6.08. If any Joint Municipality during the term hereof shall incur extraordinary costs in repair to or replacements of that part of its sewer collection system used jointly with the City, the City agrees to equitably share in the costs of such extraordinary repairs or replacements or to reduce annual fees paid by such Joint Municipality to the City under this Article VI..

Schedule A Rates and Charges for Sewage Services

1. The categories of rates and charges to be paid to the City for sewage transportation, treatment, and disposal services in accordance with Section 5.02 are as follows:

(a) Separate rates shall be applied to customers of the City, to customers of the Municipalities discharging wastes through the Harrisburg Conveyance System, and to customers of the Municipalities discharging wastes through the Steelton Conveyance System.

(b) For each Residence served by metered water service and for each Non-Residential establishment, a rate per 1,000 gallons of water used shall be charged, subject however to minimum charges. Water used for Non-Residential

establishments shall be determined by water meter or by estimates made by the Municipality in accordance with generally accepted engineering standards and practices.

(c) For each Residence not served by metered water service, a flat rate shall be charged.

2. The rates and charges described above shall be determined in accordance with the following:

(a) Rates apply to all customers of the Municipalities and the City shall be based upon a uniform distribution of the estimated amount to be received allocable to the Operating Expenses of the Harrisburg Facilities, subject to (c).

(b) Rates applied to customers in the Municipalities shall equal the rates applied to customers of the City, plus 15 percent of the portion of the City rates that is based on upon the estimated amount to be received allocable to Lease Rental payments and a margin of the same, as required under the Lease, subject to (c).

(c) Rates applied to customers of the Municipalities discharging wastes through the Steelton Conveyance System shall be based on the Harrisburg Facilities annual revenue requirements allocated only to the sewage treatment plant.

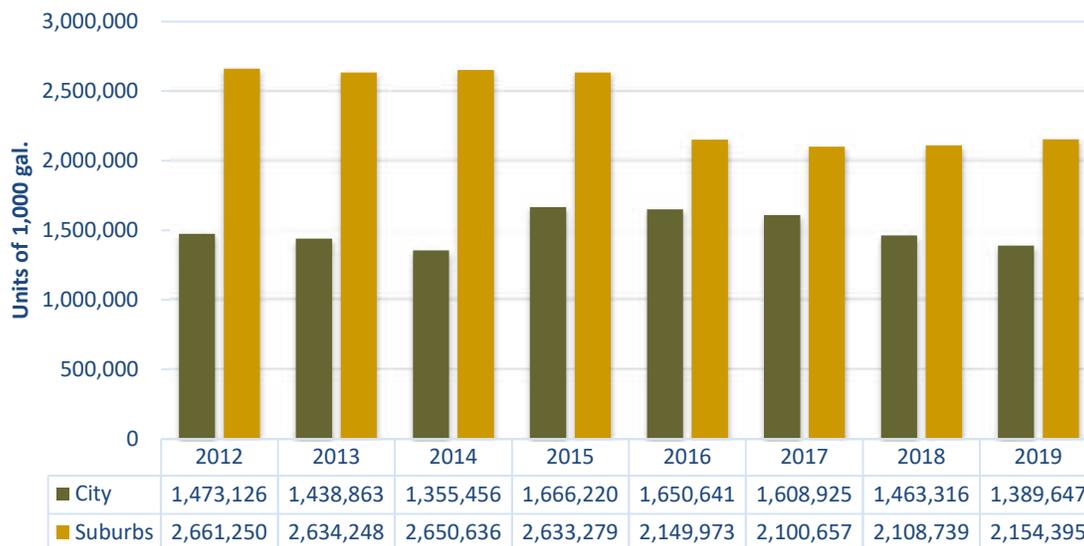
(d) The flat rate for Residences shall be based on the rate for customers with metered water service and an average water usage applicable to Residences in the service area of the Harrisburg Facilities.

(e) The minimum rates shall be those minimum rates which are imposed within each of the Municipalities and the City, respectively.

3.2. Customer Growth

The projection of wastewater rate revenues was derived from anticipated wastewater rates (retail and wholesale) in future years and assumptions regarding future changes in billed flows. Similar to the evaluation of future customer growth or decline within the water system, an analysis of recent historical changes in billed flow was completed, and along with discussions with CRW management, was used to help provide an estimate of future changes to billed flow over the forecast period. The historical annual billed retail and wholesale wastewater volumes from FY 2012 to FY 2019 are shown in Figure 3-1.

Figure 3-1. Historical Billed Wastewater Volume (1,000 gal.)



City Flows:

As shown in Figure 3-1, annual billed volume attributable to retail customers has been relatively flat from FY 2015 to FY 2017, with a decline in FY 2018 and FY 2019. The increase from FY 2014 to FY 2015 is likely attributable to CRW's continued meter repair and replacement work, as older customer meters continue to be repaired or replaced with new and more accurate water meters.

While in previous rate study reports billed flows were assumed to remain unchanged from year-to-year over the forecast period, to accurately project retail wastewater rates for FY 2021 and to be consistent with the projected decline in billed water consumption, a 2.0 percent decline in retail wastewater flows was incorporated into the forecast for FY 2021 (as compared to FY 2020) to reflect the continued economic impact of COVID-19 within the retail service area. Increases of roughly 1.0 percent per year to retail wastewater flows were incorporated into the forecast in FY 2022 and FY 2023 to restore billed flow in FY 2023 to the level originally forecasted for retail customers for FY 2021. Retail billed flows were projected to remain unchanged over the remaining years of the forecast based on the historical trend of sewer flows, CRW's historical annual water consumption (see Figure 2-1), and discussions with CRW (CRW expects no significant changes to the customer base over the forecast period).

Note that the volume of retail flows used as part of the calculation of Suburban wholesale rates (see Section 3.6) reflect actual billed flows to City retail customers in FY 2019. With FY 2020 not yet complete as of the date of this report, FY 2019 is the most recent year in which complete billing data is available from retail and wholesale customers. Therefore, the downward adjustment of retail billed flows in FY 2021 is for City retail rate projection purposes only and does not impact the calculation of Suburban wholesale rates in FY 2021.

Suburban Flows:

The billed volume for wholesale customers has been relatively flat between 2012 and 2015, with a decrease from FY 2015 to FY 2016. This decrease is attributable to a change in the estimated amount of billed flow per equivalent residential unit ("ERU") from wholesale customers whose water consumption is not available. Therefore, an estimated amount of water consumption per ERU is assumed for these customers for billing purposes.

Prior to the FY 2018 wholesale rate calculation (which used billing data from 2016), one ERU was assumed to be equal to 65,000 gallons of wastewater volume per year, as specified in the IMA; however, this amount was adjusted to 45,000 gallons per year to be more consistent with a sample of recent historical actual water consumption data from City and Suburban customers. The residential consumption and account data for FY 2019 shows the level of consumption per residential account to be about 52,000 gallons per year. CRW intends to continue to monitor the level of consumption per residential account in future years and will make adjustments to the assumption of the estimated amount of consumption associated with one ERU, if appropriate.

In addition, in future years, the proportion of billed flows between City and Suburban customers for both treatment and conveyance service was assumed to remain unchanged from FY 2019, as the impact of COVID-19 on billed flows in future years within the City and the surrounding Suburban communities is not fully known at this time.

3.3. Fiscal Requirements and Policies

3.3.1. CASH RESERVES

3.3.1.1. Operating Cash Reserves

CRW has covenanted to maintain operating cash reserves according to the terms of its existing Trust Indenture with the Bank of New York Mellon Trust Company, dated May 1, 2017 (the "Wastewater Trust Indenture") and

elects to hold additional reserves above the minimum level specified in the Wastewater Trust Indenture as an internal fiscal policy target.⁴

Operating Reserve Account:

The Wastewater Trust Indenture establishes an Operating Reserve Account, with its intended purpose being to make payments and transfers required under the Wastewater Trust Indenture in the event that revenues are insufficient to pay for operating expenses and/or debt service. The Wastewater Trust Indenture states that CRW shall maintain an amount in this account equal to at least 60 days (one sixth) of budgeted operating expenses for the current fiscal year. As of September 2020, the balance in this account was approximately \$2.1 million, which is equivalent to about 67 days of cash.

Total Combined Operating Cash Reserves:

CRW has also established a cash management target of maintaining a total cash reserve, including amounts in the Operating Reserve Account, at a minimum of 240 days of annual operating expenses. Therefore, an additional cash reserve level equal to 180 days of operating expenses was included as a minimum cash target for the system. This amount, combined with the funds held separately in the Operating Reserve Account, provides CRW with a 240-day cash reserve target. In recent years, CRW has maintained cash reserves in the Sewer Revenue Fund at a level above the minimum additional 180-day cash reserve target. Specifically, as of the beginning of FY 2021, operating cash on-hand was projected to be approximately \$6.6 million, or 213 days of cash, which exclude amounts held in the Operating Reserve Account and the Rate Stabilization Fund. Therefore, the beginning level of operating cash in FY 2021 is anticipated to exceed CRW's minimum cash reserve target.

3.3.1.2. Rate Stabilization Fund

As part of the Wastewater Trust Indenture, CRW maintains a Rate Stabilization Fund to offset a shortfall in any other fund specified in the indenture, supplement a shortfall of revenues resulting from a decline in usage of the wastewater system, and to satisfy the rate covenant provisions under the indenture. As of September 2020, the balance in this account was \$3.0 million. Note that the amount of funds transferred from the Rate Stabilization Fund for the purpose of satisfying rate covenant provisions cannot exceed 20 percent of the annual senior lien debt service requirement in the year the funds are transferred. In addition, once funds are transferred to satisfy rate covenant provisions, the funds cannot be transferred back to the Rate Stabilization Fund. No funds were assumed to be utilized from the Rate Stabilization Fund as part of the financial forecast for the wastewater system.

3.3.2. DEBT SERVICE COVERAGE

Debt service coverage is the amount of net operating revenue (operating revenue, less operating expenditures) available to fund annual principal and interest payments on outstanding debt. CRW sets its retail wastewater rates at a level sufficient to maintain debt service coverage above what is required by its Wastewater Trust Indenture. Currently, CRW's outstanding debt related to the wastewater system is comprised of PENNVEST Loans (from 2009, 2014, 2017, and 2018) and the Series 2017 Revenue and Revenue Refunding Bonds.

The required level of debt service coverage associated with CRW's outstanding debt is described in the Wastewater Trust Indenture and is summarized below.

“The Authority covenants (i) it has adopted and will charge, maintain and collect throughout its service area so long as any Bonds remain Outstanding and funds for their payment have not been provided, service rates, rents and other charges, which (after making due and reasonable allowances for prompt payment discounts, if any, contingencies and a margin of error in the estimates), shall generate Net Revenues (exclusive of Special Revenues, including connection and tapping fees, which

⁴ Trust Indenture dated as of May 1, 2017, between CRW and the Bank of New York Mellon Trust Company, N.A.

shall not constitute Gross Revenues) which shall be sufficient in each Fiscal Year to provide funds to pay (a) an amount not less than 120% of the Debt Service Requirements with respect to its Outstanding Bonds and other Parity Obligations in such Fiscal Year, (b) any amount required to replenish the Debt Service Reserve Fund in full and (c) the amount due in such Fiscal Year on all Subordinated Debt. For purposes of this covenant, Net Revenues may be increased as a result of any transfers from the Rate Stabilization Fund to the Sewer Revenue Fund during such Fiscal Year.”

CRW has established a management target for debt service coverage that is more restrictive than the bond covenant. The target consists of maintaining debt service coverage at a level of 1.40 times or greater with respect to annual debt service payments associated with current and future outstanding senior lien debt of the system. Senior lien debt includes the 2017 Revenue Bonds and the 2009 and 2014 PENNVEST loans. The 2017 and 2018 PENNVEST loans hold a subordinate claim to the net revenues of the system.

3.4. Wastewater Revenues and Expenses

3.4.1. REVENUES

CRW’s wastewater system revenues include revenue from wastewater rates assessed to City retail customers and Suburban municipalities, and from other miscellaneous sources. Wastewater revenues projected from Suburban municipalities were estimated based on the year-by-year results of the cost of service evaluation described below. The projection of wastewater revenues from City retail customers was prepared by multiplying the anticipated billed flow by the projected volumetric wastewater rates.

Miscellaneous revenues were largely generated from penalties for late payment, sludge handling charges, contractor waste fees, electricity sales, pretreatment fees, and interest income. Historically, these miscellaneous revenues have comprised approximately 5.0 to 10 percent of the revenues of the system. Except for interest income, these revenues were projected in future years based on their FY 2021 budgeted amounts. Interest income was calculated based on the average annual balance of available cash and an interest earnings rate of approximately 0.75 percent per year.

A summary of the historical and projected wastewater system revenues is provided at the end of this section in Table 3-14. Note that no adjustments were made to revenues received from late payment penalties or any other miscellaneous revenues in FY 2021 or in future years in response to continued COVID-19 impacts. With the exception of any unforeseen circumstances, CRW expects miscellaneous revenues to be realized in FY 2021 and in future years at the levels budgeted and projected based on the information available as of the date of this report.

3.4.2. EXPENSES

3.4.2.1. Operation and Maintenance Expenses

The projection of wastewater system O&M expenses was prepared based in part on adopted budget figures for FY 2021, as provided by CRW. The system’s O&M expenses were comprised of costs related to personnel, insurance, electricity, chemicals, parts and supplies, engineering services, and general operational costs. O&M expenses also include administrative costs attributable to the wastewater system, which were anticipated to total approximately \$2.6 million in FY 2021. Individual expenses were classified as labor, benefits, insurance, electricity, chemicals, professional services, minor capital, or general and were escalated in future years based on their FY 2021 budget amount and an appropriate cost escalation factor. The escalation factors for each of the expense classifications are provided in Table 3-2 and were developed based on discussions with CRW management. A summary of the historical and projected O&M expenses is provided at the end of this section in Table 3-14.

Note that while billed retail flow was adjusted downward in FY 2021 to account for reduced volumes in response to the continued impact of COVID-19, no additional adjustments were made to the system’s variable operating

costs, such as electricity, chemicals, water, or biosolids management in this year. Expenses incurred within these line items were budgeted by CRW to account for the projected decrease in billed flows in FY 2021.

Table 3-2. O&M Cost Escalation Factors

Expense Category	Escalation Rate
Labor	3.0%
Benefits	6.0%
Insurance	3.0%
Electricity	4.0%
Chemicals	4.0%
Professional Services	5.0%
Minor Capital/Equipment	3.0%
General	2.8%

3.4.2.2. Capital Expenditures

The projection of wastewater system capital expenditures was prepared based on a detailed schedule of future capital project costs provided by CRW. Future projects were mainly related to collection, conveyance, pump stations, treatment plant, and other miscellaneous capital work anticipated to be incurred over the forecast period. However, the capital project costs summarized below do not include stormwater-related projects, as those projects will be funded with stormwater fee revenue (see Section 4 of this report). Wastewater system project costs for all years of the forecast are summarized in Table 3-3.

Note that costs in FY 2022 and beyond were escalated using factor of 3.0 percent per year to reflect anticipated future capital construction cost inflation. Furthermore, the capital plan beyond FY 2021 is subject to change as CRW continues to negotiate the Long-Term Control Plan under its partial consent decree with the U.S. EPA and the Pennsylvania Department of Environmental Protection.

Table 3-3. FY 2021 Wastewater System Capital Plan

Project Type	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Collection	\$4,980,000	\$6,739,000	\$4,323,095	\$4,570,999	\$4,742,844
Conveyance	7,187,000	17,482,000	360,500	371,315	382,454
Pump Stations	2,798,000	50,000	0	0	0
Treatment Plant	4,079,990	12,639,700	6,224,290	4,434,562	3,780,835
Miscellaneous	36,000	435,000	278,100	249,312	251,327
Total	\$19,080,990	\$37,345,700	\$11,185,985	\$9,626,188	\$9,157,461

Note: Capital project costs shown in this table were provided by CRW in 2021 dollars and then escalated at a rate of 3.0 percent per year in future years for financial planning purposes.

3.5. Capital Project Funding

The wastewater system’s financial forecast assumed funding of capital project costs with a mix of cash and new debt. Cash to fund capital projects was assumed to be generated from current revenues only. No cash was assumed to be accessed from the Revenue Fund, Operating Reserve Account, or the Rate Stabilization Fund to pay for capital project costs. This capital funding and financing plan scenario was prepared and provided by CRW for scenario analysis only and should not be considered by CRW to be municipal securities advice. The financing

assumptions employed should be discussed with CRW's registered municipal advisor prior to CRW taking any action.⁵

A summary of CRW's anticipated capital funding and financing plan is provided in Figure 3-2 and assumes projects will be funded and financed with cash (current revenues), an existing PENNVEST loan, a new PENNVEST Pro-Fi loan, a bank line of credit, and new Revenue Bonds. Current revenues were assumed to fund about \$10.9 million, or roughly 12.6 percent, of the total capital spend over the forecast period. In addition, new debt in the form of a PENNVEST Pro-Fi loan was assumed to fund just over 75.0 percent of project costs over the forecast period. The existing Front Street pump station loan with PENNVEST, a bank line of credit, and new Revenue Bonds were assumed to fund the remaining 11.6 percent of capital costs over the forecast period.

The following paragraphs provide assumptions and other information about the new debt that were assumed to be used as capital funding sources:

PENNVEST Pro-Fi Loan:

- J The PENNVEST Pro-Fi loan was assumed with interest only payments in FY 2021 through FY 2025, with interest payments accruing based on the projected cost of the projects to be funded by the loan in those years and an annual interest rate of 1.0 percent. Other assumptions included issuance costs of 0.85 percent, a repayment term of 20 years, and level annual debt service payments over the repayment period. With the loan anticipated to begin amortizing in FY 2026, it is projected that the loan's future annual debt service payments would total approximately \$3.7 million per year over its term. Similar to the water system Pro-Fi loan, this loan holds a subordinate claim to the net revenues of the system.

Bank Line of Credit:

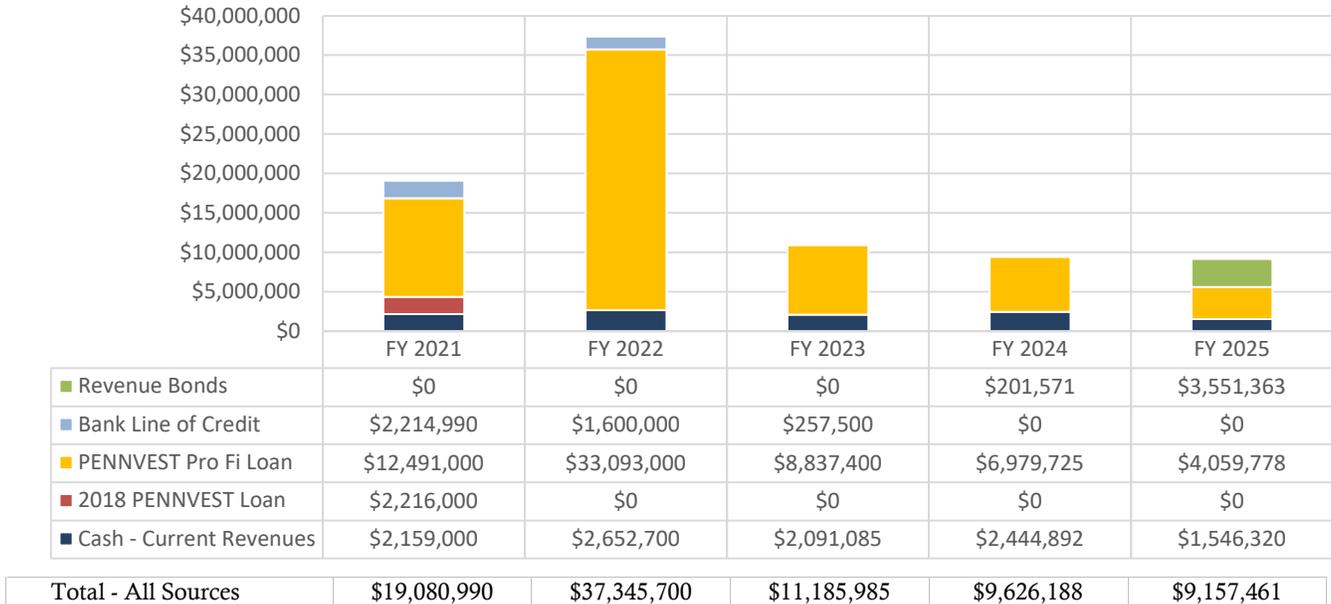
- J The bank line of credit was assumed to fund project costs in FY 2021 through FY 2023, with annual interest payments due based on the cumulative amount drawn over these years. The annual interest rate was assumed to be 2.0 percent per year. The total amount financed using the line of credit was assumed to be repaid with a future Revenue Bond issue as of FY 2024; therefore, no interest expense was assumed to be incurred on the line of credit beyond FY 2023. The line of credit was assumed to hold a subordinate claim to the net revenues of the system.

Revenue Bonds:

- J A new Revenue Bond was assumed to fund capital project costs in FY 2024 and FY 2025. Related assumptions included an annual interest rate of 5.0 percent, issuance costs of 1.5 percent, and level annual debt service payments over the 30-year repayment term. It is projected that the future annual debt service payments associated with the portion of new bonds used to directly fund capital project costs (\$3.8 million) would total \$264,000 per year, while the future annual debt service payments associated with the portion of new bonds used to repay the amount drawn on the line of credit (\$4.1 million) would total \$286,000 per year. Future Revenue Bonds were assumed to hold a senior claim to the net revenues of the system.

⁵ With meaning of municipal advisor to be as defined by the Securities Exchange Act of 1934 Rule 15Ba1-1(d)(3)vi.

Figure 3-2. Capital Project Funding Sources



3.6. Suburban Wholesale Wastewater Rate Calculation

3.6.1. COST CATEGORIZATION

The FY 2021 wastewater rate revenue requirement was allocated to Treatment, Conveyance, Collection, and City-Only cost categories in order to calculate the Suburban wholesale rates for FY 2021. The types costs included in these categories are discussed below:

-) Treatment: These costs are related to wastewater treatment processes and facilities at CRW’s AWTF and are shared by all users of the system.
-) Conveyance: These costs are related to the use of conveyance facilities and are shared by all users of the system, except customers whose wastewater flow is conveyed through the Steelton conveyance system.
-) Collection: Costs are related to the City’s collection system and only apply to City customers.
-) City-Only: Costs are related to system costs or revenues associated with City customers only and are not associated with other users of the system. Examples include costs related to billing and customer service.

FY 2021 budget line item O&M costs were allocated among the four categories listed above based on the nature of the line item expense. Wastewater specific administrative expenses were allocated based on the proportion of non-administrative costs allocated to each category. Note that roughly \$889,000 of Field Maintenance personnel-related costs and \$537,000 of the wastewater system’s share of the Administrative Fee were allocated to the stormwater system to be recovered with annual stormwater fee revenues.

CRW’s wastewater capital rate revenue requirement in FY 2021 includes costs attributable to existing debt service, new debt service, cash-funded capital, and amounts contributed to a capital reserve by both City retail and Suburban wholesale customers. Future capital projects drive the new debt service and cash-funded capital costs to be incurred in FY 2021 and the major projects for the upcoming fiscal year included the following:

-) Projects related to anaerobic digester roof repairs and cogeneration improvements. These projects were allocated to the “Treatment” category.

- J Projects related to Front Street pump station upgrades and Front Street interceptor rehabilitation work. These projects were allocated to the “Conveyance” cost category.
- J Various collection system rehabilitation work. These projects were allocated to the “Collection” cost category.

A summary of the resulting rate revenue requirement categorizations for FY 2021 is provided in Table 3-4. The O&M and capital rate revenue requirements represent annual O&M and capital costs less their respective miscellaneous revenue offsets. The total amount offset by miscellaneous revenue in FY 2021 was approximately \$1.3 million.

Table 3-4. Summary of Cost Categorization Results

Description	Treatment	Conveyance	Collection	City-Only	Total
O&M Costs	\$6,860,372	\$1,522,662	\$1,779,007	\$1,228,667	\$11,390,708
O&M Related Non-Rate Revenue Offset	<u>-899,278</u>	<u>-10,205</u>	<u>-11,908</u>	<u>-329,510</u>	<u>-1,250,900</u>
O&M Revenue Requirement	\$5,961,095	\$1,512,457	\$1,767,099	\$899,158	\$10,139,808
Allocation %	58.8%	14.9%	17.4%	8.9%	100.0%
Capital Costs	\$3,950,607	\$1,960,138	\$1,286,593	\$0	\$7,197,337
Capital Reserve Portion	977,557	192,722	0	0	1,170,279
Capital Related Non-Rate Revenue Offset	<u>-3,502</u>	<u>-1,100</u>	<u>-1,398</u>	<u>0</u>	<u>-6,000</u>
Capital Revenue Requirement	\$4,924,662	\$2,151,759	\$1,285,195	\$0	\$8,361,616
Allocation %	58.9%	25.7%	15.4%	0.0%	100.0%
Total	\$10,885,757	\$3,664,216	\$3,052,294	\$899,158	\$18,501,424

3.6.1.1. Capital Reserve Contributions

As noted in Section 3.6.1, CRW’s wastewater capital rate revenue requirement is comprised of various components, including the annual amount of cash used to fund capital project costs. In the past, when the annual dollar amount of cash-funded treatment and/or conveyance system related projects differed substantially from one year to the next, the capital charge portion of the wholesale rates has been affected. This has caused wholesale rates to vary significantly at times.

In order to reduce the impact of this on future wholesale rates, CRW has elected to establish a capital reserve for Suburban customers. Beginning in FY 2021, the reserve is to be funded with excess wholesale revenues generated from the capital charge portion of the wholesale rates (as determined by an end of year true-up calculation) and the 15.0 percent markup that is added to the capital charge portion of the wholesale rates per the IMA.⁶

Funding the Capital Reserve in FY 2021:

The reserve will be funded in FY 2021 by both City and Suburban customers as follows:

Suburban Customers:

- J The wholesale rates in FY 2021 were calculated to be less than the wholesale rates in FY 2020 (\$0.38 per 1,000 gal., or 8.6 percent, less for the Suburban rate and \$0.32 per 1,000 gal., or 9.7 percent, less for Steelton’s wholesale rate). In turn, the Treatment and Conveyance portions of the capital charge component of the wholesale rates were adjusted, such that the calculated wholesale rates in FY 2021 were

⁶ Pursuant to the IMA between CRW and its Suburban customers, CRW assesses the capital charge (lease rental) portion of the wholesale rates at a level that is 1.15 times the capital charge portion of the City retail wastewater rate. See Section 2(b) of Schedule A within the Second Supplemental Agreement between CRW and its municipal customers dated September 15, 1976.

equal to the existing (FY 2020) wholesale rates. The resulting additional revenues from the adjusted capital charge will be recognized as Suburban customer contributions to the capital reserve.

-) In addition, the revenues generated from the 15.0 percent markup that is added to the capital charge component of the wholesale rates will be recognized as a Suburban customer contribution to the capital reserve.

City Customers:

-) CRW plans to have City customers make contributions to the reserve on a flow proportionate basis. For example:
 - o For every \$1 generated from the adjustment of the Treatment portion of the capital charge component of the wholesale rates, City customers will contribute roughly \$0.64, as City customers are responsible for 39.2 percent of the flows received at the AWTF.
 - o For every \$1 generated from the adjustment of the Conveyance portion of the capital charge component of the wholesale rates, City customers will contribute about \$0.71, as City customers are responsible for 41.5 percent of the total flows conveyed to the AWTF.

Funding the Capital Reserve in Future Years:

The reserve is anticipated to be funded in future years by both City and Suburban customers as follows:

Suburban Customers:

-) In years when the capital charge portion of the calculated wholesale rates is higher than the capital charge portion of the existing wholesale rates, the calculated capital charge will be adjusted such that no more than a 4.0 percent increase of the Suburban wholesale rates is realized. Additional revenues from the adjusted capital charge resulting in revenues from the suburban customers being higher than cost of service will be recognized as Suburban customer contributions to the capital reserve.
-) In years when the capital charge portion of the calculated wholesale rates is lower than the capital charge portion of the existing wholesale rates, the calculated capital charge will be adjusted downward such that no more than a 4.0 percent increase of the Suburban wholesale rates is realized. The resulting lost revenues from the adjusted capital charge will be recognized as a use of funds by Suburban customers from the capital reserve to pay for conveyance- or treatment-related capital projects.
-) In addition, in all years, the revenues generated from the 15.0 percent markup that is added to the capital charge portion of the wholesale rates will be recognized as a Suburban customer contribution to the capital reserve.

City Customers:

-) City customers will also make contributions to, and draw funds from, the capital reserve. The City customers' contributions will be made on a flow proportionate basis to the Suburban customer contributions. See details on reserve funding by City customers in FY 2021 for a further explanation.

The anticipated annual Suburban and City contributions to the capital reserve are shown in Table 3-5. As shown in the table, contributions are projected to be made by Suburban customers to the capital reserve in each year of the forecast period. For example, in FY 2021, Suburban customers are expected to contribute \$1.3 million to the reserve, which is comprised of its share of Treatment and Conveyance portions of the reserve (about \$594,000 and \$113,000, respectively) plus the revenues generated from the 15.0 percent markup on the capital charge component of the wholesale rates (approximately \$638,000).

City customers are also projected to contribute to the reserve in each year of the forecast. As shown in the table, their contribution of roughly \$463,000 in FY 2021 reflects their proportionate contribution to the capital reserve.

Table 3-5. Summary of Projected City and Suburban Contributions to the Capital Reserve

Line No.	Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Suburban Contribution to:						
1	Treatment	\$ 594,249	\$ 513,971	\$ 633,786	\$ 330,457	\$ 694,911
2	Conveyance	112,787	265,287	392,175	411,078	666,699
3	15% Markup on Capital Charge	637,941	663,415	689,907	719,045	747,745
4	Total	\$ 1,344,976	\$ 1,442,674	\$ 1,715,869	\$ 1,460,579	\$ 2,109,355
5	Cumulative Balance	\$ 1,344,976	\$ 2,787,651	\$ 4,503,519	\$ 5,964,099	\$ 8,073,454
Treatment Flow Proportions:						
6	City	39.2%	39.5%	39.7%	39.7%	39.7%
7	Suburban	60.8%	60.5%	60.3%	60.3%	60.3%
8	Total	100.0%	100.0%	100.0%	100.0%	100.0%
Conveyance Flow Proportions:						
9	City	41.5%	41.7%	42.0%	42.0%	42.0%
10	Suburban	58.5%	58.3%	58.0%	58.0%	58.0%
11	Total	100.0%	100.0%	100.0%	100.0%	100.0%
City Contribution to:						
12	Treatment (Line 1 ÷ Line 7 x Line 6)	\$ 383,308	\$ 334,895	\$ 417,161	\$ 217,508	\$ 457,394
13	Conveyance (Line 2 ÷ Line 10 x Line 9)	79,935	189,928	283,624	297,294	482,161
14	Total	\$ 463,243	\$ 524,823	\$ 700,785	\$ 514,802	\$ 939,555
15	Cumulative Balance	\$ 463,243	\$ 988,066	\$ 1,688,851	\$ 2,203,654	\$ 3,143,209

3.6.2. COST ALLOCATION

The categorized costs were allocated to City and Suburban customers based on each customer’s proportionate usage of the system. A summary of the wastewater flows attributable to City customers and to each of the Suburban customers is shown in Table 3-6.

Table 3-6. Customer Units of Service

Municipality	Non-Metered Consumption ERU’s ¹	Non-Metered Consumption (1,000 gal.)	Metered Consumption (1,000 gal.)	Total Consumption (1,000 gal.)	Extraneous WW Flow (1,000 gal.) ²	Total WW Volume (1,000 gal.)
City of Harrisburg	0	0	1,389,647	1,389,647	2,131,090	3,520,737
Penbrook Borough	1,333	59,985	8,600	68,585	105,178	173,763
Paxtang Borough	665	29,925	5,546	35,471	54,396	89,867
Swatara Township-via Harrisburg	0	0	404,134	404,134	619,759	1,023,893
Swatara Township-via Steelton	0	0	68,722	68,722	105,389	174,111
Lower Paxton Township	13,268	597,060	201,395	798,455	1,224,469	2,022,924
Susquehanna Township	11,166	502,470	151,642	654,112	1,003,112	1,657,223
Steelton Borough	0	0	124,916	124,916	191,565	316,482
Total	26,432	1,189,440	2,354,601	3,544,041	5,434,959	8,979,000

¹One ERU was assumed to be equal to 45,000 gallons of consumption per year.

²Calculated as the difference between total annual wastewater flow volume received at the AWTF in FY 2019, less billed volume for FY 2019. Extraneous flow volumes were allocated among customer classes based on their proportionate billed volume amounts.

The units of service that were used to allocate costs were based on metered and billed water consumption in FY 2019. This implicitly assumes that inflow and infiltration (“I&I”) flow volumes are proportional to the billed water consumption amounts. As a result, I&I costs were implicitly distributed proportionally to billed flows.

In addition, as shown in Table 3-6, an estimate of the amount of consumption per equivalent residential unit (“ERU”) was made and used as a proxy of flow for individual customers whose metered consumption was not available (see column labeled Non-Metered Consumption ERU’s). As shown in Table 3-7, the five-year average of consumption per residential account from FY 2015 to FY 2019 for CRW’s residential water customers was approximately 52,400 gallons per year, which is higher than, but continues to remain relatively comparable to, the assumption of 45,000 gallons per year for one ERU.

Table 3-7. Historical CRW Water Consumption per Residential Account

Fiscal Year	Billed Consumption (1,000 gal.)	Number of Residential Customers	Annual Billed Water Consumption per Customer (1,000 gal.)
2015	987,569	18,728	52.7
2016	987,559	18,682	52.9
2017	964,886	18,357	52.6
2018	956,959	18,273	52.4
2019	937,571	18,186	51.6
5-Year Historical Average			52.4

Source: Historical billing and customer data provided by CRW.

The units of service of all customers were distributed to the four cost categories based on each customer’s use of the wastewater system. This is shown in Table 3-8. In addition, the unit cost of service was calculated by dividing the categorized costs under each category by the units of service applicable to each cost category. The unit cost of service for O&M and capital costs is shown in Table 3-9.

Table 3-8. Allocation of Units of Service to Cost Driver Categories

Municipality	Treatment	Conveyance	Collection	City-Only
City of Harrisburg	100%	100%	100%	100%
Penbrook Borough	100%	100%	0%	0%
Paxtang Borough	100%	100%	0%	0%
Swatara Township-via Harrisburg	100%	100%	0%	0%
Swatara Township-via Steelton	100%	0%	0%	0%
Lower Paxton Township	100%	100%	0%	0%
Susquehanna Township	100%	100%	0%	0%
Steelton Borough	100%	0%	0%	0%

Table 3-9. Unit Cost of Service

Description	Treatment	Conveyance	Collection	City-Only
Units of Service (1,000 gal.)	3,544,041	3,350,403	1,389,647	1,389,647
Operating Revenue Requirement	\$5,961,095	\$1,512,457	\$1,767,099	\$899,158
Capital Revenue Requirement	\$4,924,662	\$2,151,759	\$1,285,195	\$0
Operating Unit Cost (\$/1,000 gal.)	\$1.68	\$0.45	\$1.27	\$0.65
Capital Unit Cost (\$/1,000 gal.)	\$1.39	\$0.64	\$0.92	\$0.00

3.6.3. WHOLESALE RATE CALCULATION

The FY 2021 wholesale rates for Suburban customers were calculated using the unit cost of service for each cost category as calculated in Table 3-9 and the service provided to each customer. These results are shown in Table 3-10. Since the City does not provide collection service to Suburban municipalities, the Suburban wholesale rates exclude the unit cost for the Collection category. Similarly, a separate wholesale rate is shown for Steelton since Steelton’s wastewater is conveyed to CRW’s AWTP through the Steelton conveyance system, which is owned, operated, and maintained by Steelton Borough. As such, the wholesale rate for Steelton includes CRW’s cost of treatment but excludes CRW’s cost for conveyance and collection service.

As shown in Table 3-10, the Suburban wholesale rate was calculated to be \$4.47 per 1,000 gallons, which is the same as the existing (FY 2020) rate. The wholesale rate for Steelton was calculated to be \$3.28 per 1,000 gallons, which is also the same as the existing (FY 2020) rate. Additional wholesale rate calculation details are provided in Appendix A of this report. In addition, there is a small amount of Suburban flow that is conveyed through CRW’s collection system. For this portion of flow, the appropriate Suburban municipalities should pay the unit collection rate of \$2.19 per 1,000 gallons that is shown in Table 3-10 (\$1.27 per 1,000 gallons for O&M costs, plus \$0.92 per 1,000 gallons for Capital costs), in addition to the calculated treatment and conveyance rates.⁷

Table 3-10. Calculated Wholesale Rates (FY 2021)

Description	City	Suburban ¹	Steelton ²
O&M Rate:			
Treatment	\$1.68	\$1.68	\$1.68
Conveyance	\$0.45	\$0.45	\$0.00
Collection	\$1.27	\$0.00	\$0.00
City-Only	<u>\$0.65</u>	<u>\$0.00</u>	<u>\$0.00</u>
Total O&M Rate per 1,000 gal.	\$4.05	\$2.13	\$1.68
Capital Charge (Lease Rental Rates):³			
Treatment	\$1.39	\$1.60	\$1.60
Conveyance	\$0.64	\$0.74	\$0.00
Collection	\$0.92	\$0.00	\$0.00
City-Only	\$0.00	\$0.00	\$0.00
Other ⁴	<u>\$1.22</u>	<u>\$0.00</u>	<u>\$0.00</u>
Total Charge per 1,000 gal.	\$4.18	\$2.34	\$1.60
Total Rate per 1,000 gal.	\$8.23	\$4.47	\$3.28
Existing Rate per 1,000 gal.	\$7.99	\$4.47	\$3.28
Percent Change	3.0%	0.0%	0.0%

¹Includes Penbrook and Paxtang Borough, Swatara, Lower Paxton, and Susquehanna Township.

²Steelton Borough and a portion of Swatara Township do not share in conveyance system costs.

³Reflects a 15 percent markup to the unit costs per Section 2b of Schedule A of the Intermunicipal Agreement.

⁴Reflects the need for a cash surplus and other adjustments.

Based on the calculated wholesale rates shown in Table 3-10 and the estimated wholesale customer units of service shown in Table 3-6, wastewater treatment and conveyance revenue requirements were allocated to each of the different wholesale customers. Penbrook Borough, Paxtang Borough, Swatara Township (via Harrisburg), Lower

⁷ See Section 6.01 and Section 6.02 of the intermunicipal agreement between the City and the Suburban customers for the specific provisions associated with the calculation and assessment of the rate to be paid by customers connecting to, and sending flows through, CRW’s collection system.

Paxton Township, and Susquehanna Township were allocated costs based on the unit cost of service for treatment service and conveyance service, and each municipality’s estimated units of service for the year. Swatara Township (via Steelton) and Steelton Borough were allocated costs based on the unit cost of service for treatment service only and each municipality’s estimated units of service for the year. The portion of the FY 2021 revenue requirement that was allocated to each wholesale customer is shown in Table 3-11.

Table 3-11. Allocation of Revenue Requirements to Wholesale Customers

Wholesale Customer	Treatment			Conveyance			Total Allocated Cost
	Unit Cost of Treatment (\$/1,000 gal.) ¹	Units of Service (1,000 gal.)	Allocated Cost	Unit Cost of Conveyance (\$/1,000 gal.) ²	Units of Service (1,000 gal.)	Allocated Cost	
Penbrook Borough	\$3.28	68,585	\$ 224,959	\$1.19	68,585	\$ 81,616	\$ 306,575
Paxtang Borough	\$3.28	35,471	116,345	\$1.19	35,471	42,210	158,555
Swatara Township (via Harrisburg)	\$3.28	404,134	1,325,560	\$1.19	404,134	480,919	1,806,479
Swatara Township (via Steelton)	\$3.28	68,722	225,408	\$0.00	-	-	225,408
Lower Paxton Township	\$3.28	798,455	2,618,932	\$1.19	798,455	950,161	3,569,094
Susquehanna Township	\$3.28	654,112	2,145,486	\$1.19	654,112	778,393	2,923,878
Steelton Borough	\$3.28	124,916	409,726	\$0.00	-	-	409,726
Total			\$ 7,066,415			\$ 2,333,300	\$ 9,399,715

¹Represents the total of the O&M (\$1.68) and the Capital (\$1.60) unit rates under the Treatment line items in Table 3-10.

²Represents the total of the O&M (\$0.45) and the Capital (\$0.74) unit rates under the Conveyance line items in Table 3-10.

3.7. Wastewater System Retail Rate Revenue Requirements

A summary of the revenue requirements for City customers is shown in Table 3-12. Revenue requirements include O&M expenses, debt service, minor capital outlays, cash-funded capital project expenditures, and City and Suburban contributions to capital reserves. Non-rate revenues were subtracted from these expenses in order to determine the annual retail rate revenue requirement. Wholesale revenue, which was estimated by multiplying the wholesale rates calculated in Section 3.6 by the projected amount of Suburban customer wastewater flow in future years, was included in the calculation on Line 10 and serves to offset the City’s annual rate revenue requirements. The Sources and Uses of Funds amount (Line 13) represents the use of cash reserves to fund capital project costs (when negative), and the accumulation of cash to be carried over into future years (when positive).

As shown in Table 3-12, increases to City retail rate revenue are anticipated to be needed each year, from FY 2021 through FY 2025, to fund the annual costs of the system and to meet fiscal policy targets related to cash reserves and debt service coverage. Specifically, the rate revenue increases are projected to be 3.0 percent in FY 2021 and 4.0 percent per year in FY 2022 through FY 2025. Note that the wastewater rate increases in FY 2022 through FY 2025 are planning level adjustments only and are subject to change in future years.

These moderate increases are also needed to build revenues to a level sufficient to meet minimum debt service coverage targets in anticipation of the projected additional annual debt service expenses associated with future Revenue Bonds and the PENNVEST Pro-Fi loan in FY 2026 and beyond. Note that future annual debt service associated with these funding sources alone are projected to be just over \$5.8 million in FY 2026. As a result, debt service in FY 2026 is projected to be about \$10.8 million, while debt service as budgeted in FY 2021 is just over \$5.0 million.

Table 3-12. Projected Wastewater Rate Revenue Requirements

Line No.	Description	Fiscal Year Ending December 31				
		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
O&M Expenses and Transfers						
1	Operating and Maintenance Expenses	\$ 11,205,922	\$ 11,602,142	\$ 12,013,923	\$ 12,429,909	\$ 12,861,921
2	Minor Capital	184,786	190,330	196,039	201,921	207,978
3	Transfer to Operating Reserve Account	-	-	11,817	73,010	75,826
4	Total O&M and Transfers Out	\$ 11,390,708	\$ 11,792,471	\$ 12,221,779	\$ 12,704,839	\$ 13,145,725
Capital Expenditures						
5	Debt Service	\$ 5,038,337	\$ 5,517,739	\$ 5,618,275	\$ 5,906,283	\$ 6,202,004
6	Cash Funded Capital	2,159,000	2,652,700	2,091,085	2,444,892	1,546,320
7	Contributions to Capital Reserves ¹	1,170,279	1,304,082	1,726,747	1,256,337	2,301,165
8	Total Capital Expenditures	\$ 8,367,616	\$ 9,474,521	\$ 9,436,107	\$ 9,607,511	\$ 10,049,490
9	Total O&M and Capital	\$ 19,758,324	\$ 21,266,992	\$ 21,657,887	\$ 22,312,350	\$ 23,195,215
Less: Non-Rate Revenues						
10	Wholesale Revenue	\$ (9,399,715)	\$ (9,756,375)	\$ (10,124,308)	\$ (10,553,841)	\$ (10,960,933)
11	Miscellaneous Revenue	(1,188,450)	(1,188,450)	(1,188,450)	(1,188,450)	(1,188,450)
12	Interest Revenue	(68,450)	(65,033)	(77,914)	(93,691)	(110,613)
13	Sources and Uses of Funds	2,887,270	2,338,111	2,964,955	3,285,088	3,376,695
14	Total Non-Rate Revenues	\$ (7,769,345)	\$ (8,671,748)	\$ (8,425,718)	\$ (8,550,895)	\$ (8,883,301)
15	Rate Revenue Requirement	\$ 11,988,979	\$ 12,595,245	\$ 13,232,169	\$ 13,761,455	\$ 14,311,914
16	Proposed Retail Wastewater Rate Adjustment	3.0%	4.0%	4.0%	4.0%	4.0%

¹Includes both City and Suburban contributions. Excludes the portion of Suburban contributions attributable to the 15% markup on the capital charge.

3.8. Proposed Retail and Wholesale Wastewater Rates

3.8.1. EXISTING RATE STRUCTURE

The calculated and proposed City retail and Suburban wholesale wastewater rates for FY 2021 through FY 2025 are shown in Table 3-13. The wholesale wastewater rates shown for FY 2021 through FY 2025 were projected by calculating the actual O&M rate component of the wholesale rate and then adjusting the capital charge component of the rate such that the increase to the total wholesale rate as compared to the prior year was no more than approximately 4.0 percent per year. This resulted in a contribution of wholesale revenues to the capital reserves in each year of the forecast period (see Table 3-5). These monies will then be available to offset more burdensome increases to calculated wholesale rates in future years as CRW continues to incur significant capital related costs as part of its partial consent decree with the U.S. EPA and the Pennsylvania Department of Environmental Protection in the years beyond FY 2025.

Table 3-13. Proposed Retail and Wholesale Wastewater Rates

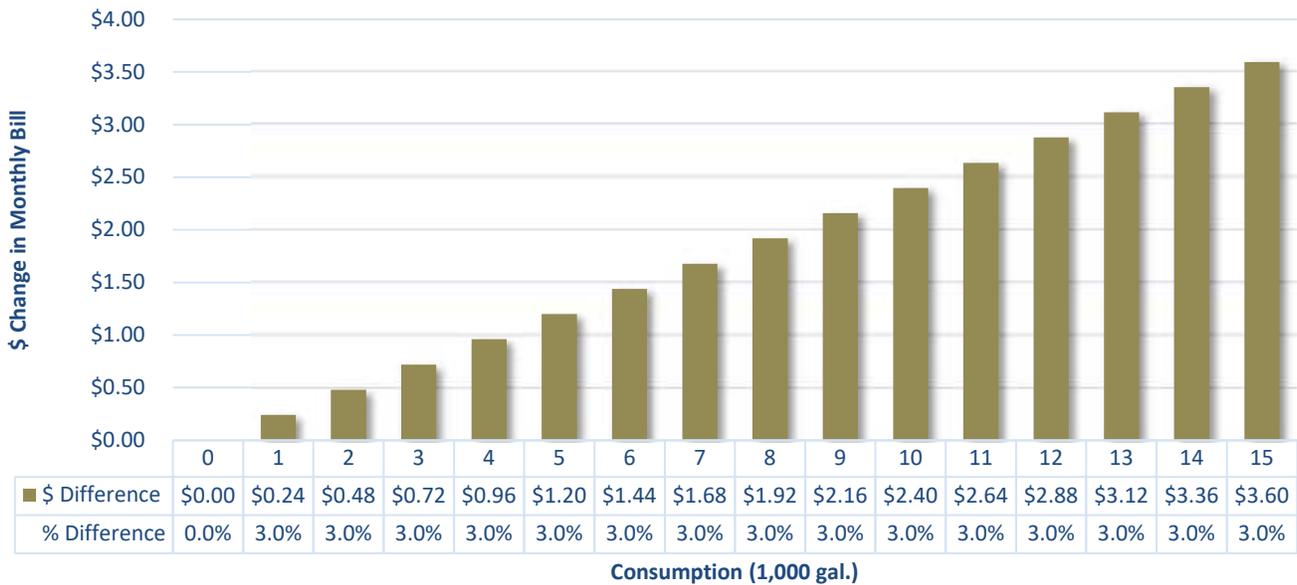
Retail Volumetric Rate (1,000 gal.)						
Description	Existing FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
All Retail Customers	\$7.99	\$8.23	\$8.56	\$8.90	\$9.26	\$9.63

Wholesale Volumetric Rate (1,000 gal.)						
Municipality	Existing FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
All, except Steelton	\$4.47	\$4.47	\$4.64	\$4.81	\$5.02	\$5.21
Steelton	\$3.28	\$3.28	\$3.40	\$3.53	\$3.68	\$3.82

3.9. Retail Customer Bill Impacts

Expected customer bill impacts associated with the calculated FY 2021 retail wastewater rates are provided in Figure 3-3. The bill impacts are provided across a range of consumption levels and assume use of a 5/8-inch meter. As shown in Figure 3-3, a residential customer with billed flow of between 3,000 - 4,000 gallons per month would experience an increase in their wastewater bill of \$0.72 to \$0.96, or 3.0 percent, per month, as compared to the existing (FY 2020) retail wastewater rates. In addition, note that the dollar increase in the monthly bill amount becomes larger as the level of consumption rises. However, the percentage increase to a customer’s bill remains the same across all levels of consumption, at 3.0 percent.

Figure 3-3. Retail Residential (5/8”) Wastewater Bill Impact (FY 2021)



3.10. Wastewater System Cash Flow Projection

A cash flow forecast showing the projected cash revenues and expenses of the wastewater system is provided in Table 3-14. As shown in the forecast, unrestricted cash is anticipated to be maintained at a level of at least 180 days of O&M expenses (Line 41). In addition, the cash balance in the Operating Reserve Account is anticipated to be maintained separately at a level equal to at least 60 days of operating expenses. Therefore, in total, it is anticipated that CRW will maintain operating cash reserves of at least 240 days of O&M expenses over the forecast

period (at least 180 days, as shown on Line 41, plus at least 60 days held separately in the Operating Reserve Account).

Note that the projected ending cash levels do not reflect any true-up payments to, or from, suburban customers related to potential true-up settlements from prior years. Therefore, the projected ending cash balances over the forecast period may be higher or lower than shown in Table 3-14. Furthermore, the ending cash balances in the table also do not include City or Suburban contributions to the capital reserve. This amount is subtracted from ending cash balances in each year, as shown on Line 38 of the forecast. See Section 3.6.1.1 for a detailed discussion on the accumulation and use of funds within the capital reserve.

The projected debt service coverage levels are also shown in Table 3-14 (Lines 44-45). Debt service coverage levels are anticipated to be at least 1.40 times the debt service of annual senior lien debt in each year over the forecast period. Note that revenues generated from City and Suburban customers to fund the capital reserve have been included as part of net revenue in the debt service coverage calculation shown in the forecast and are understood to be available to pay debt service according to certain provisions contained in the Wastewater Trust Indenture. In years where funds are drawn from the capital reserve to pay for cash-funded capital costs in future years (not projected in the forecast), these amounts are not included in debt service coverage calculations; however, as these funds have not been formally restricted for a specific use, it is assumed that City and Suburban monies held in the reserve may be available to pay debt service and other costs of the system, if needed. No funds from the Rate Stabilization Fund were assumed to be utilized to meet the minimum debt service coverage target in any year of the forecast.

Within the forecast, and as discussed previously, stormwater related personnel costs were removed from the Personnel – Field Maintenance (Line 13) and CRW Admin Fund Expense (Line 20) line items, as stormwater related costs from within these line items will be funded with stormwater fee revenues in FY 2021 and in all future years. Other stormwater related O&M costs and all stormwater related capital costs, such as debt service and/or cash funded capital, were not included in the wastewater cash flow forecast, as these costs will be fully funded with the stormwater fee revenues in future years as well.

Table 3-14. Wastewater System Cash Flow Projection

Line No.	Description	Actual FY 2019	Budget FY 2020	Projected FY 2020	Budgeted FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Revenues									
1	Sales to City Customers	\$ 11,192,843	\$ 11,877,332	\$ 10,663,731	\$ 11,988,979	\$ 12,595,245	\$ 13,232,169	\$ 13,761,455	\$ 14,311,914
2	Sales to Public Authorities	9,760,123	8,875,959	8,728,058	9,399,715	9,756,375	10,124,308	10,553,841	10,960,933
3	Contractor Waste Fees	789,948	650,000	597,243	650,000	650,000	650,000	650,000	650,000
4	Penalties	316,021	275,000	142,417	275,000	275,000	275,000	275,000	275,000
5	Sludge Handling	86,480	65,000	95,405	95,000	95,000	95,000	95,000	95,000
6	Interest Income	342,950	204,003	158,878	68,450	65,033	77,914	93,691	110,613
7	Interest Income - DSRF	64,107	71,000	19,962	5,000	5,000	5,000	5,000	5,000
8	Other Revenue	266,508	143,500	194,310	163,450	163,450	163,450	163,450	163,450
9	Total Revenues	\$ 22,818,980	\$ 22,161,794	\$ 20,600,004	\$ 22,645,594	\$ 23,605,103	\$ 24,622,841	\$ 25,597,438	\$ 26,571,910
Operating Expenses									
<i>Personnel:</i>									
10	Management	\$ 896,145	\$ 851,189	\$ 835,593	\$ 830,756	\$ 861,659	\$ 893,848	\$ 927,383	\$ 962,327
11	Treatment	1,515,117	1,577,696	1,552,316	1,568,189	1,627,629	1,689,596	1,754,211	1,821,599
12	Maintenance	640,321	650,955	700,616	716,860	744,409	773,147	803,131	834,422
13	Field Maintenance	1,352,166	995,584	1,394,845	533,678	561,233	590,307	620,988	653,368
14	Other	106,941	111,500	225,450	100,000	106,000	112,360	119,102	126,248
<i>Operations:</i>									
15	Management	\$ 476,669	\$ 605,329	\$ 550,613	\$ 669,703	\$ 689,309	\$ 709,490	\$ 730,263	\$ 751,644
16	Treatment	2,191,148	2,307,973	2,001,406	2,226,200	2,307,265	2,391,440	2,468,479	2,548,094
17	Maintenance	169,076	167,500	126,215	181,300	186,376	191,595	196,960	202,474
18	Field Maintenance	946,523	465,916	474,036	598,000	617,620	637,925	657,278	677,238
19	Other	410,197	953,450	1,006,973	1,061,335	1,104,718	1,150,138	1,197,695	1,247,491
<i>Other Operating Expenses:</i>									
20	CRW Admin Fund Expense	\$ 2,896,717	\$ 3,223,630	\$ 2,904,143	\$ 2,674,901	\$ 2,749,798	\$ 2,826,793	\$ 2,905,943	\$ 2,987,309
21	Minor Capital Outlay	269,105	309,050	302,475	222,286	228,955	235,823	242,898	250,185
22	Transfers to Operating Reserve	-	-	-	-	-	11,817	73,010	75,826
23	CRW Bank and Trustee Fees	9,324	4,500	6,000	7,500	7,500	7,500	7,500	7,500
24	Total Operating Expenses	\$ 11,879,448	\$ 12,224,272	\$ 12,080,679	\$ 11,390,708	\$ 11,792,471	\$ 12,221,779	\$ 12,704,839	\$ 13,145,725
Debt Service									
<i>Existing Debt Service</i>									
25	2009 PENNVEST Loan	\$ 114,120	\$ 114,120	\$ 114,120	\$ 114,120	\$ 114,120	\$ 114,120	\$ 114,120	\$ 114,120
26	2014 PENNVEST Loan	1,186,527	1,186,527	1,186,527	1,186,527	1,208,649	1,210,660	1,210,660	1,210,660
27	2017 PENNVEST Loan	64,166	197,427	197,427	197,427	197,427	197,427	199,047	203,906
28	Series 2017 Rev and Ref Bonds	2,845,050	2,851,450	2,851,450	2,848,950	2,848,250	2,853,250	2,851,000	2,851,750
29	2018 PENNVEST Loan	68,167	117,014	117,014	617,155	617,155	617,155	617,155	617,155
<i>New Debt Service</i>									
30	Bank Line of Credit	\$ -	\$ -	\$ -	\$ 44,300	\$ 76,300	\$ 81,450	\$ -	\$ -
31	Revenue Bonds	-	-	-	-	-	-	300,291	549,806
32	PENNVEST Pro-Fi Loan	-	35,195	-	29,859	455,840	544,214	614,011	654,609
33	Total Debt Service	\$ 4,278,030	\$ 4,501,733	\$ 4,466,538	\$ 5,038,337	\$ 5,517,739	\$ 5,618,275	\$ 5,906,283	\$ 6,202,004
34	Capital Projects Funded with Cash	\$ 11,742,111	\$ 5,571,720	\$ 10,581,720	\$ 2,159,000	\$ 2,652,700	\$ 2,091,085	\$ 2,444,892	\$ 1,546,320
35	Total Revenue Requirements	\$ 27,899,589	\$ 22,297,725	\$ 27,128,937	\$ 18,588,045	\$ 19,962,911	\$ 19,931,139	\$ 21,056,013	\$ 20,894,050
36	Revenues Over (Under) Expenditures	\$ (5,080,609)	\$ (135,931)	\$ (6,528,933)	\$ 4,057,549	\$ 3,642,192	\$ 4,691,702	\$ 4,541,424	\$ 5,677,861
37	Beginning Balance				\$ 6,619,270	\$ 8,868,600	\$ 10,543,295	\$ 12,818,342	\$ 15,384,385
38	Capital Reserve Contributions (City + Suburban customer portion)				(1,808,219)	(1,967,497)	(2,416,654)	(1,975,382)	(3,048,911)
39	Revenues Over (Under) Expenditures				4,057,549	3,642,192	4,691,702	4,541,424	5,677,861
40	Ending Balance¹				\$ 8,868,600	\$ 10,543,295	\$ 12,818,342	\$ 15,384,385	\$ 18,013,335
41	Ending Balance - Days O&M				285	327	384	443	501
42	Target Reserve Balance (180 days O&M)				\$ 5,699,104	\$ 5,899,986	\$ 6,114,640	\$ 6,356,170	\$ 6,576,613
43	Projected City Rate Increase				3.0%	4.0%	4.0%	4.0%	4.0%
44	DSC (Senior debt, 1.40x DS Mgmt target)				2.69	2.82	2.95	2.86	2.82
45	DSC (All debt, 1.15x DS Mgmt target)				2.22	2.13	2.19	2.17	2.15
46	Capital Projects - Cash Funded				\$ 2,159,000	\$ 2,652,700	\$ 2,091,085	\$ 2,444,892	\$ 1,546,320
47	Capital Projects - Funded with PENNVEST Loans				14,707,000	33,093,000	8,837,400	6,979,725	4,059,778
48	Capital Projects - Funded with Rev Bonds or Other Debt				2,214,990	1,600,000	257,500	201,571	3,551,363
49	Capital Projects - Total				\$ 19,080,990	\$ 37,345,700	\$ 11,185,985	\$ 9,626,188	\$ 9,157,461

¹Excludes cash held in the Operating Reserve Account, Rate Stabilization Fund, and City and Suburban monies held in the capital reserve.

4. Stormwater Fee Evaluation

As part of the stormwater fee evaluation, stormwater system fee revenue requirements were estimated for each year of the forecast period and revenues from existing fees were projected and compared to the fee revenue requirement to assess the need for any fee adjustments. The stormwater system revenue requirements were prepared using the industry accepted and practiced cash-needs approach. The cash-needs approach aims to provide revenues sufficient to recover total cash requirements of the stormwater system over the forecast period.

Note that while CRW intends to account for its stormwater management costs separately to ensure that fee revenues sufficiently recover associated costs, the stormwater system operates as a component of CRW's wastewater system. Furthermore, within the Wastewater Trust Indenture, references to the word System are specifically noted to include "...all tangible property...owned or operated by the Authority and used in the rendering of sewer and/or wastewater services by the Authority" and as a result, Pledged Revenues and Operating Expenses, as described in the indenture, are understood to include stormwater related revenues and expenses.

4.1. Existing Stormwater Fees

CRW's existing stormwater fees are assessed on a per equivalent residential unit ("ERU") basis, with each ERU being assessed a fee of \$73.76 per year in FY 2020 and one ERU including 1,023 square feet ("SF") of impervious area ("IA"). The fee is assessed differently among residential and non-residential customers. The following examples are provided to describe how CRW assesses its stormwater fees:

Residential – Tier 1:

-) Residential customers with between 400 SF and 700 SF of IA are assigned a fee multiplier of 0.5x and this multiplier is applied to the annual fee per ERU of \$73.76 to yield an annual stormwater fee of \$36.88 ($\73.76×0.5).

Residential – Tier 2:

-) Residential customers with IA between 700 SF and 2,200 SF are assigned a fee multiplier of 1.0x, with this multiplier applied to the annual fee per ERU to yield an annual stormwater fee of \$73.76 ($\73.76×1.0).

Residential – Tier 3:

-) Residential customers with more than 2,200 SF of IA are assigned a multiplier based on their total IA and the IA included in one ERU. Therefore, if a residential property is known to include 3,069 SF of IA, it would be assigned a multiplier of 3.0x ($3,069 \text{ SF} \div 1,023 \text{ SF}$), based on its total IA and the IA associated with one ERU. This multiplier would then result in an annual stormwater fee of \$221.28 ($\73.76×3.0).

Non-Residential:

-) Non-residential customers are assigned a multiplier and assessed an annual stormwater fee in the same manner as the Residential – Tier 3 customers.

CRW's existing stormwater fees are provided in Table 4-1.

Table 4-1. Existing (FY 2020) Stormwater Fees

Customer Class / Tier	Fee Multiplier	Fee per Month	Fee per Year
Residential:			
Tier 1 (>400 and <= 700 SF)	0.5x	\$3.07	\$36.88
Tier 2 (>700 and <= 2,200 SF)	1.0x	\$6.15	\$73.76
Tier 3 (>2,200 SF)	n/a (individualized)	\$0.60 per 100 SF	\$7.21 per 100 SF
Non-Residential	n/a (individualized)	\$0.60 per 100 SF	\$7.21 per 100 SF

4.2. Stormwater Revenues and Expenses

4.2.1. REVENUES

CRW’s stormwater system revenues include fee revenues and interest earnings. Gross fee revenues of \$5.2 million were budgeted for FY 2021 and were budgeted to be offset by \$260,000 in stormwater fee credits, which results in net stormwater fee revenues of \$4.9 million in FY 2021. Stormwater fee credits are earned by customers as the result of construction, operation, and maintenance of stormwater management practices that reduce a parcel’s contribution of stormwater runoff. Stormwater credits in future years were based on the budgeted amount in FY 2021 and were escalated in future years in order to remain at 5.0 percent of gross stormwater fee revenues. The amount of residential and commercial impervious area was projected to remain unchanged over the forecast period. Therefore, projected increases to stormwater fee revenue over the forecast period were the result of proposed fee increases only. The full amount of the stormwater fees assessed were assumed to be collected by CRW.

Interest earnings were calculated in each year based on the average annual balance of available cash and an interest earnings rate of 0.75 percent per year. A summary of projected stormwater revenues is included at the end of this section in Table 4-5.

4.2.2. EXPENSES

4.2.2.1. Operation and Maintenance Expenses

Stormwater system expenses included O&M expenses and minor capital expenditures. In general, O&M expenses were comprised of costs related to personnel, various professional services, and general operating costs. O&M expenses also include a portion of administrative costs, which are allocable to the stormwater system. The allocation of these costs was budgeted to total \$637,000 in FY 2021.

To project O&M costs, individual expenses were classified as labor, benefits, professional services, and general, and were escalated in future years based their FY 2021 budgeted amount and an appropriate cost escalation factor. Labor costs were escalated at 3.0 percent per year, benefit costs were escalated at 6.0 percent per year, while professional service and general operating costs were escalated at 5.0 percent and 2.8 percent per year, respectively. A summary of projected stormwater O&M expenses is provided at the end of this section in Table 4-5.

GSI O&M Costs:

General operating costs also included additional annual green stormwater infrastructure (“GSI”) O&M costs. GSI O&M costs include costs incurred related to GSI inspections and maintenance, reporting and asset management, training and workforce development, and program management. Additional GSI O&M costs were assumed to result from the installation of new GSI throughout the system, as included in the 5-year capital plan that was provided by CRW for the stormwater system.

Future annual GSI O&M costs were assumed to be 2.0 percent of the cumulative cost of newly installed GSI. For example, the cost of installed GSI from the capital plan in FY 2022 was projected to be roughly \$6.2 million. Therefore, the estimated additional annual O&M cost associated with the installed GSI was estimated to be roughly \$124,000 (\$6.2 million × 2.0 percent) in FY 2022, with this amount escalated at 2.8 percent in future years. Additional GSI O&M costs were added in the remaining years of the forecast period in the same manner. The O&M cost associated with the GSI scheduled to be installed in FY 2021 was assumed to be included in the FY 2021 budgeted expenses provided by CRW for the stormwater system.

4.2.2.2. Debt Service

Stormwater system debt service includes interest payments on an existing PENNVEST Pro-Fi loan. Per CRW, the loan has been arranged to fund specific stormwater system capital project costs in FY 2021 through FY 2025, with the loan not beginning to amortize until FY 2026.

Interest payments on the loan in FY 2021 and in remaining years of the forecast were calculated based on an assumed annual interest rate of 1.0 percent and the cumulative cost of projects anticipated to be funded by the loan, through FY 2025. Total annual interest expense on this loan was projected to range from \$12,000 to \$124,000 per year over the forecast period.

The PENNVEST Pro-Fi loan holds a subordinate claim on the net revenues of the wastewater system. Therefore, a debt service coverage target of 1.15 times or greater with respect to annual debt service payments associated with all current and future outstanding debt of the stormwater system was assumed. This is consistent with the all-in debt service coverage target assumed for the wastewater system.

4.2.2.3. Capital Expenditures

The projection of stormwater system capital expenditures was prepared based on a schedule of future capital project costs provided by CRW. Project costs were mainly related to GSI installations and other miscellaneous stormwater management related projects and are summarized for each year of the forecast in Table 4-2. Capital project costs in FY 2022 and beyond were escalated using a factor of 3.0 percent per year to reflect anticipated future capital construction cost inflation relative to 2021. Similar to the wastewater system capital plan, the stormwater capital plan beyond FY 2021 is subject to change as CRW continues to negotiate the Long-Term Control Plan under its partial consent decree with the U.S. EPA and the Pennsylvania Department of Environmental Protection.

Table 4-2. FY 2021 Stormwater System Capital Plan

Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
GSI Projects	\$2,217,000	\$6,183,000	\$4,486,680	\$2,333,980	\$655,636
Other Stormwater Related	<u>656,000</u>	<u>282,000</u>	<u>319,300</u>	<u>545,303</u>	<u>334,374</u>
Total	\$2,873,000	\$6,465,000	\$4,805,980	\$2,879,283	\$990,011

Note: Capital project costs shown in this table were provided by CRW in 2021 dollars and then escalated at a rate of 3.0 percent per year in future years for financial planning purposes.

4.3. Capital Project Funding

The financial forecast for the stormwater system was prepared using an assumed mix of funding sources to fund capital project costs. Specific instruction on the amount of cash, grants, and debt used to fund project costs was provided by CRW. The financial assumptions employed should be discussed with CRW’s registered municipal

advisor prior to CRW taking any action and the scenario assumptions should not be considered specific municipal securities advice.⁸

A summary of CRW’s capital project funding plan is shown in Figure 4-1. Cash and grant monies were assumed to fund 31.2 percent all stormwater related capital project costs over the forecast period. The PENNVEST Pro-Fi loan was assumed to fund the remaining portion (68.8 percent).

Figure 4-1. Capital Project Funding Sources



4.4. Stormwater System Revenue Requirements

A summary of the rate revenue requirements of the stormwater system is shown in Table 4-3. Rate revenue requirements include O&M expenses, debt service, and cash-funded capital project expenditures. Revenue offsets from fee credits were added to these expenses, while interest earnings were subtracted in order to determine the annual rate revenue requirement. The Sources and Uses of Funds amount (Line 8) represents the use of cash reserves to fund capital project costs (when negative), and the accumulation of cash to be carried over into future years (when positive). As shown in Table 4-3, no increases to stormwater fee revenue are projected to be needed in FY 2021 and FY 2022, while increases of 3.0 percent are projected to be needed each year in FY 2023 through FY 2025. Note that the stormwater fee revenue increases projected to be needed in FY 2022 through FY 2025 are planning level only and are subject to change in future years.

⁸ With meaning of municipal advisor to be as defined by the Securities Exchange Act of 1934 Rule 15Ba1-1(d)(3)(vi).

Table 4-3. Projected Stormwater System Revenue Requirements

Line No.	Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
1	O&M Expenses	\$ 2,639,439	\$ 2,849,273	\$ 3,031,668	\$ 3,176,758	\$ 3,293,021
	Capital Expenditures:					
2	Debt Service	\$ 11,567	\$ 57,552	\$ 97,207	\$ 118,425	\$ 123,889
3	Cash Funded Capital	<u>1,579,500</u>	<u>1,866,500</u>	<u>840,480</u>	<u>757,483</u>	<u>443,647</u>
4	Total Capital Expenditures	\$ 1,591,067	\$ 1,924,052	\$ 937,687	\$ 875,908	\$ 567,536
5	Total O&M, Transfers Out, and Capital	\$ 4,230,506	\$ 4,773,325	\$ 3,969,355	\$ 4,052,666	\$ 3,860,557
	Less Non-Rate Revenues:					
6	Fee Revenue Offsets	\$ 260,000	\$ 260,000	\$ 267,800	\$ 275,834	\$ 284,109
7	Interest Revenue	(3,920)	(7,235)	(12,109)	(20,852)	(31,229)
8	Sources and Uses of Funds	<u>713,413</u>	<u>173,909</u>	<u>1,130,955</u>	<u>1,209,032</u>	<u>1,568,744</u>
9	Total Non-Rate Revenues	\$ 969,494	\$ 426,675	\$ 1,386,645	\$ 1,464,014	\$ 1,821,623
10	Rate Revenue Requirement	\$ 5,200,000	\$ 5,200,000	\$ 5,356,000	\$ 5,516,680	\$ 5,682,180
11	Proposed Rate Increase	0.0%	0.0%	3.0%	3.0%	3.0%

4.5. Proposed Stormwater Fees

The projected stormwater fees for FY 2021 and the planning level fees from FY 2022 through FY 2025 are shown in Table 4-4. The fees shown in the table were calculated based on CRW’s existing stormwater fees and the stormwater fee revenue adjustments calculated in Table 4-3.

Table 4-4. Proposed Stormwater Fees

Customer Class / Tier	Existing (FY 2020)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Residential:						
Tier 1 - >400 and <= 700 SF	\$36.88	\$36.88	\$36.88	\$37.99	\$39.13	\$40.30
Tier 2 - >700 and <= 2,200 SF	\$73.76	\$73.76	\$73.76	\$75.97	\$78.25	\$80.60
Tier 3 - >2,200 SF (per 100 SF)	\$7.21	\$7.21	\$7.21	\$7.43	\$7.65	\$7.88
Non-Residential (per 100 SF)	\$7.21	\$7.21	\$7.21	\$7.43	\$7.65	\$7.88

4.6. Stormwater System Cash Flow Projection

A cash flow forecast for the stormwater system is shown in Table 4-5. As shown in the forecast, unrestricted cash is anticipated to be maintained at a level below 180 days of O&M expenses (Line 17) in FY 2021 and FY 2022, but above this target in FY 2023 through FY 2025. A management target of 180 days was selected for the stormwater system in order to be consistent with the liquidity target incorporated into the wastewater system’s financial forecast. CRW has decided against adjusting stormwater fees in order to meet the liquidity target for the system in the first two years of the forecast period, as the days cash on-hand metric combined wastewater and stormwater systems is well above the management target for operating reserves in FY 2021 and FY 2022. See Section 3.10 of this report for a more detailed discussion of the level of cash reserves projected for the wastewater system.

The projected debt service coverage levels are also shown in Table 4-5. Debt service coverage levels are anticipated to be well above the minimum requirements of debt service coverage for all system debt. A management target of 1.15 times total annual debt service was selected for the stormwater system is consistent with in the all-in management target assumed for the wastewater system.

Note that the cash surpluses on Line 13 contribute to a growing cash reserve balance (Line 16) for the stormwater system over the forecast period. The annual rate adjustments of 3.0 percent in FY 2023 through FY 2025 were designed to build cash reserves in future years with moderate rate adjustments to provide CRW with the flexibility to cash fund a greater portion of its stormwater management related capital projects in future years beyond FY 2025 if it desires to do so and to avoid the need for additional future debt.

Table 4-5. Stormwater System Cash Flow Projection

Line No.	Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Revenues						
1	Stormwater Fee Revenues	\$ 5,200,000	\$ 5,200,000	\$ 5,356,000	\$ 5,516,680	\$ 5,682,180
2	Fee Credits	(260,000)	(260,000)	(267,800)	(275,834)	(284,109)
3	Interest Earnings and Other Revenue	3,920	7,235	12,109	20,852	31,229
4	Total Revenues	\$ 4,943,920	\$ 4,947,235	\$ 5,100,309	\$ 5,261,698	\$ 5,429,301
Operating Expenses						
5	Personnel	\$ 1,305,921	\$ 1,349,257	\$ 1,394,142	\$ 1,440,639	\$ 1,488,810
6	Operations and Maintenance	1,333,518	1,376,357	1,420,669	1,466,512	1,513,941
7	Additional O&M from GSI	-	123,660	216,856	269,608	290,269
8	Total Operating Expenses	\$ 2,639,439	\$ 2,849,273	\$ 3,031,668	\$ 3,176,758	\$ 3,293,021
Debt Service						
9	PENNVEST Pro Fi Loan	\$ 11,567	\$ 57,552	\$ 97,207	\$ 118,425	\$ 123,889
10	Total Debt Service	\$ 11,567	\$ 57,552	\$ 97,207	\$ 118,425	\$ 123,889
11	Capital Projects Funded with Cash	\$ 1,579,500	\$ 1,866,500	\$ 840,480	\$ 757,483	\$ 443,647
12	Total Revenue Requirements	\$ 4,230,506	\$ 4,773,325	\$ 3,969,355	\$ 4,052,666	\$ 3,860,557
13	Revenues Over (Under) Expenditures	\$ 713,413	\$ 173,909	\$ 1,130,955	\$ 1,209,032	\$ 1,568,744
14	Beginning Cash Balance	\$ 167,855	\$ 881,268	\$ 1,055,177	\$ 2,186,132	\$ 3,395,164
15	Revenues Over (Under) Expenditures	713,413	173,909	1,130,955	1,209,032	1,568,744
16	Ending Cash Balance	\$ 881,268	\$ 1,055,177	\$ 2,186,132	\$ 3,395,164	\$ 4,963,907
17	Ending Balance - Days O&M	120	133	260	385	543
18	Target Reserve Balance (180 days O&M)	\$ 219,953	\$ 237,439	\$ 252,639	\$ 264,730	\$ 274,418
19	Projected City Rate Increase	0.0%	0.0%	3.0%	3.0%	3.0%
20	DSC (All debt, 1.15x DS target)	198.89	36.33	21.16	17.43	16.99
21	Capital Projects - Cash Funded	\$ 1,579,500	\$ 1,866,500	\$ 840,480	\$ 757,483	\$ 443,647
22	Capital Projects - Grant Funded	136,781	-	-	-	-
23	Capital Projects - Funded w/ PENNVEST Loans	1,156,719	4,598,500	3,965,500	2,121,800	546,364
24	Capital Projects - Total	\$ 2,873,000	\$ 6,465,000	\$ 4,805,980	\$ 2,879,283	\$ 990,011

5. Residential Bill Comparison

CRW's proposed water and wastewater rates were compared to the rates currently in effect for other utilities within the region by calculating and comparing estimated water and wastewater bills for a typical residential customer. In addition to CRW, the following utilities were included in the comparison of estimated bills:

-) City of Allentown, PA
-) City of Bethlehem, PA
-) City of Lancaster, PA
-) Lower Paxton Township, PA (served by SUEZ Water)
-) Paxtang Borough, PA (served by SUEZ Water)
-) Penbrook Borough, PA (served by SUEZ Water)
-) Pennsylvania American Water
-) City of Philadelphia, PA
-) City of Pittsburg, PA/ALCOSAN
-) Steelton Borough, PA (served by Pennsylvania American Water)
-) Susquehanna Township, PA (served by SUEZ Water)
-) Swatara Township, PA (served by SUEZ Water)

Monthly bills were estimated for a typical residential customer at each utility based on an assumed amount of water consumption, wastewater flow, and meter size. To calculate the estimated monthly bills, a 5/8-inch meter and 3,750 gallons (5.01 hundred cubic feet) of water consumption and wastewater flow were assumed.

5.1. Water Bill Comparison

The comparison of estimated residential monthly water bills is shown in Figure 5-1. CRW's existing (FY 2020) water rates, as well as its proposed FY 2021 water rates, were included in the comparison. As shown in the figure, CRW's estimated monthly bill under existing FY 2020 and proposed FY 2021 rates were less than the estimated monthly bills of seven of the 12 communities surveyed. Note that the estimated monthly water bill for residential customers was assumed to be the same for Lower Paxton, Paxtang, Penbrook, Susquehanna, and Swatara, as water service is provided by SUEZ Water in these communities.⁹

⁹ SUEZ Water bills are based on proposed rates as of November 2020.

Figure 5-1. Estimated Monthly Residential Water Bill Comparison

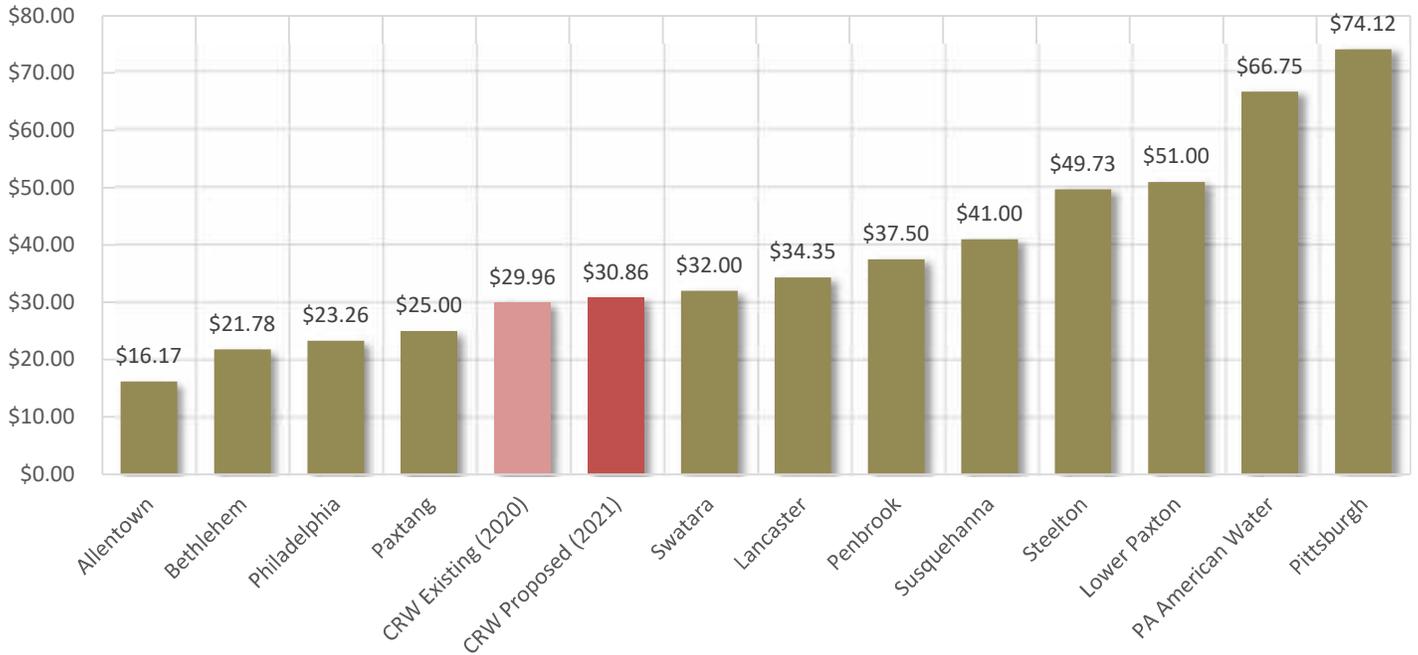


Note: SUEZ Water provides water service to Paxtang, Penbrook, Lower Paxton, Susquehanna, and Swatara.

5.2. Wastewater Bill Comparison

The comparison of estimated monthly wastewater bills is provided by customer type in Figure 5-2. As shown in the figure, CRW’s estimated monthly residential wastewater bill under its existing FY 2020 and proposed retail wastewater rates was less than eight of the 12 communities surveyed. As discussed previously, CRW provides wholesale treatment service to Steelton and a portion of Swatara. Therefore, their estimated monthly bills include CRW’s wholesale treatment rate, as well as the local collection and conveyance costs in these communities. In addition, CRW provides wholesale treatment and conveyance service to Lower Paxton, Paxtang, Penbrook, Susquehanna, and a portion of Swatara. Therefore, their estimated monthly bills include CRW’s wholesale rates for treatment and conveyance service, as well as the local collection costs in these communities.

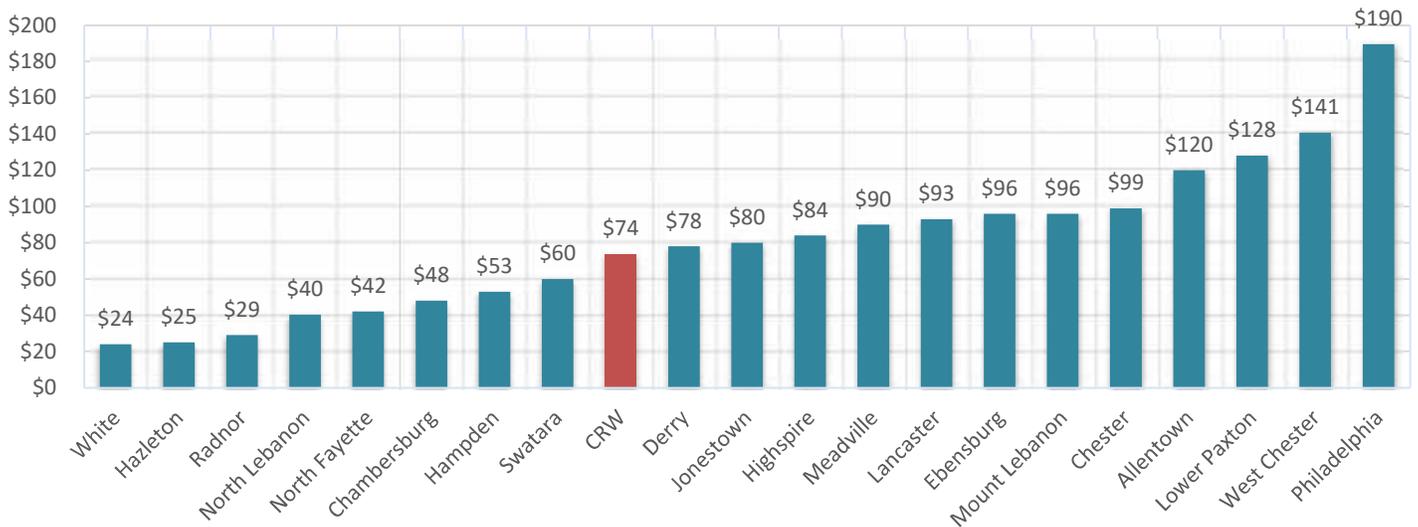
Figure 5-2. Estimated Monthly Residential Wastewater Bill Comparison



5.3. Stormwater Bill Comparison

On October 1, 2020, CRW implemented a stormwater fee of \$73.76 per 1,023 square feet (“SF”) per year to cover the stormwater management related costs of its combined wastewater system. As discussed in Section 4 of this report, no change to the stormwater fee is projected in FY 2021. This fee was compared to the annual stormwater fees currently assessed (as of November 2020) by a sample of 20 other municipalities in the State of Pennsylvania. The results of this comparison are provided in Figure 5-3. As shown in the figure, the projected fee was generally comparable to the stormwater fees currently assessed by other utilities in the region, as it was less than 12 out of the 20 utilities included in the survey.

Figure 5-3. Survey of Annual Residential Stormwater Fees in PA



6. Conclusions and Recommendations

6.1. Water System

1. A water rate revenue increase of 2.0 percent is recommended in FY 2021. This increase was applied proportionally to all rate components to calculate the proposed FY 2021 rates.
2. Under the proposed FY 2021 water rates, the Ready to Serve Charge for a customer with a 5/8" meter would increase from \$7.77 to \$7.93 per month, while the volume charge would increase from \$9.84 per 1,000 gallons to \$10.04 per 1,000 gallons at the beginning of fiscal year FY 2021. This rate structure is expected to continue to generate approximately 30 percent of rate revenues from the Ready to Serve Charge and approximately 70 percent from the Volumetric Rate.
3. The recommended water rate increase in FY 2021 would raise the typical residential bill by \$0.89 per month, from \$44.67 to \$45.56 assuming consumption of 3,750 gallons per month. This increase, if adopted, corresponds to a water rate increase of 2.0 percent for the typical residential customer. Water rate increases of 2.0 percent per year in the remaining years of the forecast period are anticipated to cover projected costs and to meet fiscal requirements and targets in these years.
4. Based on the results of the rate comparison, CRW's proposed FY 2021 water rates are comparable to the other communities included in the comparison. For example, the monthly residential water bill based on proposed FY 2021 rates for a customer using 3,750 gallons per month was calculated to be less than seven of the 12 communities surveyed.

6.2. Wastewater System

1. A retail wastewater rate revenue increase of 3.0 percent is recommended in FY 2021 and will result in the same percentage increase for all retail wastewater customers.
2. The recommended retail wastewater increase in FY 2021 would raise the typical retail residential bill by about \$0.90 per month, from \$29.96 to \$30.86 assuming 3,750 gallons of discharged wastewater per month. A retail rate revenue increase of 4.0 percent is projected each year in FY 2022 through FY 2025 to cover projected costs and to meet fiscal requirements and targets in these years, and to build revenues to a level sufficient to meet minimum debt service coverage targets in anticipation of the additional annual debt service costs associated with assumed future Revenue Bond issues and the PENNVEST Pro-Fi loan in FY 2026 and beyond.
3. The wastewater cost of service evaluation results indicated that the unit cost of providing wastewater treatment and conveyance service to Suburban wholesale customers in FY 2021 will remain unchanged from the unit rates calculated in FY 2020, at \$4.47 per 1,000 gallons for treatment and conveyance service to Suburban customers and \$3.28 per 1,000 gallons for treatment service to Steelton.
4. A wastewater collection rate of \$2.19 per 1,000 gal. was calculated and is applicable to the volume of Suburban flow that is conveyed through CRW's collection system. This rate represents the calculated unit cost of collection service (O&M = \$1.27 + Capital = \$0.92 per 1,000 gal.).
5. While no true-up provision is included in the IMA between CRW and the Suburban communities, a true-up calculation applicable to the FY 2020 wholesale rates is expected to be completed during FY 2021 with actual costs and billing data from FY 2020. If the true-up determines that CRW has received an

overpayment from wholesale customers in FY 2020, this amount is anticipated to be transferred by CRW to each suburban customer in FY 2021. Such a true-up payment would lower the ending cash balances projected over the forecast period for the wastewater system, unless any overpayment is transferred into a cash reserve and not returned to the Suburban customers.

6. Based on the results of the rate comparison, CRW's retail wastewater rates are comparable to the other utilities included in the survey. For example, the monthly residential bill based on proposed FY 2021 retail rates for customers discharging 3,750 gallons per month was calculated to be \$30.86, which is less than eight of the 12 utilities surveyed.

6.3. Stormwater System

1. No stormwater fee revenue adjustment is needed in FY 2021. No fee revenue adjustment is projected to be needed in FY 2022; however, adjustments of 3.0 percent per year are projected to be needed in FY 2023 through FY 2025.
2. Based on the results of the fee comparison, CRW's stormwater fee is comparable to other utilities included in the survey. For example, the annual fee per ERU in FY 2021 (unchanged from FY 2020) of \$73.76 was noted to be less than 12 out of the 20 stormwater utilities included in the survey.