

Capital Region Water

Fiscal Year 2020 Water and Wastewater Rate Study Report

Final Report / December 2019

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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”) 2020 and providing planning level estimates of rate increases in FY 2021 through FY 2024 (“the forecast period”). CRW provides retail water service to customers located inside the City of Harrisburg (“City”) and in portions of municipalities located outside the City, and retail wastewater service to City customers and wholesale wastewater 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. Identification of water system costs to be recovered from all customers and recommending annual rate revenue adjustments for FY 2020 through FY 2024.
2. Identification of wastewater system costs allocable to Suburban communities to determine the resulting unit rates for Suburban wholesale customers in FY 2020.
3. Identification of stormwater-related costs to be recovered from the stormwater fee (planned to be implemented July 1, 2020).
4. Calculation of wastewater system costs to be recovered from City and suburban customers, and development of recommended retail and suburban wholesale rates for FY 2020 through FY 2024.
5. Comparison of CRW’s proposed FY 2020 water and wastewater rates 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 20,200 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 to be 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 - 42-inch diameter transmission mains, 200 miles of distribution piping ranging from six to 36-inches in diameter, 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, 29 miles of stormwater

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 City and Suburban wholesale customers. Suburban wholesale customers include Susquehanna Township, Lower Paxton Township, Swatara Township, Paxtang Borough, Penbrook Borough, and Steelton Borough.

1.3. Rate Study Process

The proposed water rates were calculated by estimating the water system's rate revenue requirement in FY 2020 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.

The Suburban wholesale wastewater rates in FY 2020 were developed by completing the following steps:

1. Estimating the wastewater system rate revenue requirement in FY 2020.
2. Allocating the revenue requirement to cost categories attributable to City retail customers and Suburban wholesale customers.
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 costs attributable to Suburban customers (with adjustments) by the applicable units of service.

The retail wastewater rates were developed by estimating the wastewater system's rate revenue requirement for each year of the forecast period, 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.

CRW plans to implement a stormwater fee beginning July 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 2020 wastewater budget provided by CRW excluded a portion of the stormwater costs that have historically been included in the wastewater budget and recovered with CRW's retail wastewater rates. Additional stormwater costs were removed from the projections in future years through FY 2024 to reflect the stormwater fee being in effect for the full fiscal year, beginning in FY 2021. The identification of stormwater revenue requirements and the development of stormwater fees are included in a separate report dated May 14, 2019.

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 existing retail water sales 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 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. The Ready to Serve Charge varies by meter size and the volumetric rate is the same for all customers. The existing rate structure generates approximately 30 percent of the total rate revenue from the Ready to Serve Charge and approximately 70 percent from the volumetric rate. The existing (FY 2019) water rates are shown in Table 2-1.

Table 2-1. Existing (FY 2019) Water Rates

Ready to Serve Charge	
Meter Size	Cost per Month
5/8”	\$7.62
3/4”	\$16.50
1”	\$33.10
1-1/2”	\$70.91
2”	\$130.00
3”	\$363.40
4”	\$649.97
6”	\$1,754
8”	\$3,119
10”	\$4,407
12”	\$7,020
Volumetric Rate	
Consumption	Cost per 1,000 gal.
All	\$9.65

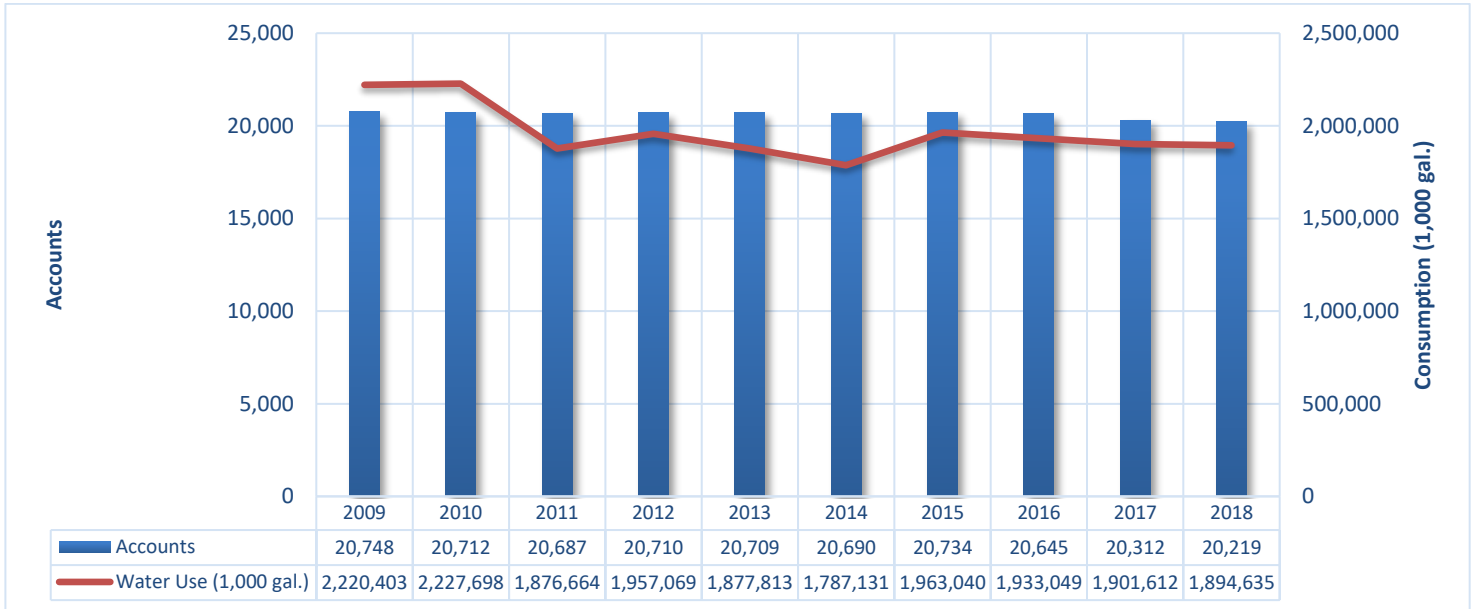
2.2. Customer Growth

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 consumption was completed to help provide an estimate of future annual changes over the forecast period. The historical number of water accounts and volume of billed consumption over the last ten fiscal years, from FY 2009 to FY 2018, was analyzed and is shown in Figure 2-1.

As shown in the figure, in FY 2015, billed water consumption increased relative to prior years, which may have been 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 2018, total billed water consumption declined by approximately 1.2 percent per year, while the number of accounts declined by about 0.8 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), the average annual impact to the Ready to Serve Charges from future changes in customer accounts was estimated to be about 0.1 percent per year, while billed consumption was projected to be unchanged from year to year. It should be noted that historical customer account data by meter size was not available; therefore, growth or decline trends in the number of customers by meter size was unable to be analyzed and incorporated into the projection of the Ready to Serve Charge revenue. Therefore, the change in accounts was assumed to represent the overall revenue impact of the growth or decline in customer accounts among various meter sizes, as compared to the prior fiscal year.

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.

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.

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 in a given month 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 August 2019, the balance in this account was approximately \$1.7 million, which is equivalent to about 63 days cash on-hand for FY 2020.

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 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 cash reserve.

In recent years, CRW has maintained total operating cash reserves at a level well above the minimum cash reserve target. Specifically, as of the beginning of FY 2020, 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 \$16.0 million. With budgeted operating expenses for FY 2020 totaling about \$9.1 million, this equates to roughly 632 days cash on-hand. Therefore, the beginning level of cash in the Revenue Fund in FY 2020 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 \$8.9 million on-hand as of August 2019, and 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 2021 and FY 2022.

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 August 2019, the balance in this account was approximately \$3.2 million.

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 2015 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 the sale of water and from other miscellaneous sources. Water sales include sales to customers on a retail basis, as well as metered water sales to 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 \$736,000 was budgeted in FY 2020 and then projected separately from other 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, these 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 2020 budgeted amounts. 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 1.5 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.

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 on adopted budget figures for FY 2020, 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 2020. 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 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 the historical and projected O&M expenses is provided at the end of this section in Table 2-6.

Table 2-2. O&M Cost Escalation Factors

Expense Category	Escalation Rate
Labor	3.0%
Benefits	6.0%
Insurance	3.0%
Electricity	3.0%
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 schedule of future capital project costs as provided by CRW. The annual capital projects were mainly related to raw water supply, treatment, transmission, distribution, and meter replacements. Project costs for all years are summarized in Table 2-3. CRW plans to acquire a new administrative building in FY 2020 and this cost comprises a significant portion of the \$5.5 million shown under the Miscellaneous line item in FY 2020. Project costs in FY 2021 through FY 2024 were escalated to future year dollars at a rate of 3.0 percent per year. The capital plan in the years beyond FY 2020 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 2020	FY 2021	FY 2022	FY 2023	FY 2024
Raw Water Supply	\$1,107,000	\$5,294,200	\$11,012,142	\$5,682,180	\$56,275
Treatment	515,000	1,014,550	541,059	721,200	185,709
Transmission	591,000	386,250	79,568	81,955	84,413
Distribution	6,174,000	10,026,020	10,573,990	11,084,623	11,713,170
Meter Replacements	150,000	154,500	159,135	163,909	168,826
Miscellaneous	5,515,000	206,031	105,142	120,997	627,360
Total	\$14,052,000	\$17,081,551	\$22,471,035	\$17,854,863	\$12,835,754

Note: Capital project costs shown in this table were provided in 2020 dollars and then escalated at a rate of 3.0 percent per year in future years for financial planning purposes.

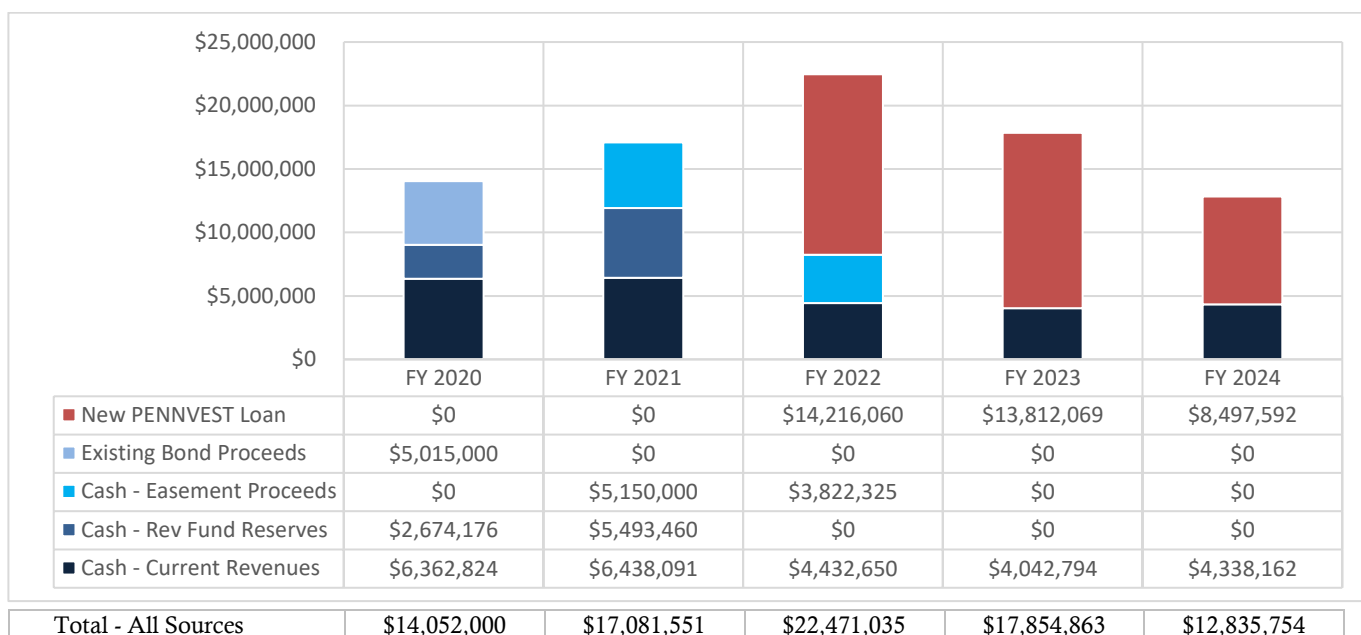
2.5. Capital Project Funding

The financial plan 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 proceeds. 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 by CRW management 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 advisor² prior to CRW taking any action.

A summary of the assumed capital funding and financing plan is shown in Figure 2-2, which 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. Cash reserves from the Revenue Fund were assumed to be used to fund about \$8.2 million, or roughly 9.7 percent, of the total capital spend over the forecast period. Over the forecast period, cash (current revenues, plus reserves, plus conservation easement monies) was assumed to be used to fund approximately 50.7 percent of the capital project costs, while existing bond proceeds (6.0 percent) and the new PENNVEST loan (43.3 percent) were assumed to be used to fund the remaining 49.3 percent. As discussed previously, the new PENNVEST loan was assumed to hold a senior claim to the net revenues of the water system and was assumed with interest-only payments in FY 2022 and FY 2023. One-half of the full debt service payment was assumed to be due in FY 2024, with level annual debt service payments in all other years (except for the final year), an annual interest rate of 1.0 percent, a repayment term of 20 years, and issuance costs of 0.85 percent.

Figure 2-2. Capital Project Funding Sources



2.5.1. REVENUE REQUIREMENTS

A summary of the estimated water system rate revenue requirements from FY 2020 through FY 2024 are shown in Table 2-4. The rate revenue requirements include O&M expenses, minor capital outlays, debt service, and cash funded capital project expenditures. Non-rate revenues were subtracted from the total revenue requirements in order to estimate the rate revenue requirement to be generated from retail water sales. 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 2020 to generate sufficient retail water sales revenue to cover the rate revenue requirement. In addition, a rate revenue adjustment of 2.0 percent per year is also projected in FY 2021 through FY 2023, while no adjustment is projected to be needed in FY 2024. The projection of rate increases in FY 2021 through FY 2024 are subject to change.

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

Table 2-4. Water Rate Revenue Requirements

Line No.	Description	Fiscal Year Ending December 31				
		FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
O&M Expenses and Transfers						
1	Operating and Maintenance Expenses	\$ 9,130,505	\$ 9,443,349	\$ 9,768,129	\$ 10,105,353	\$ 10,455,554
2	Minor Capital	412,800	425,184	437,940	451,078	464,610
3	Transfer to Operating Reserve Account	-	31,000	58,394	60,622	62,946
4	Total O&M and Transfers Out	\$ 9,543,305	\$ 9,899,533	\$ 10,264,462	\$ 10,617,053	\$ 10,983,110
Capital Expenditures						
5	Debt Service	\$ 10,991,049	\$ 10,988,549	\$ 11,129,460	\$ 11,271,080	\$ 11,595,212
6	Cash Funded Capital	9,037,000	11,931,551	4,432,650	4,042,794	4,338,162
7	Total Capital Expenditures	\$ 20,028,049	\$ 22,920,100	\$ 15,562,110	\$ 15,313,874	\$ 15,933,374
8	Total O&M, Transfers Out, and Capital	\$ 29,571,354	\$ 32,819,633	\$ 25,826,572	\$ 25,930,927	\$ 26,916,484
Less Non-Rate Revenues						
9	Miscellaneous Revenue	\$ (1,801,000)	\$ (1,801,000)	\$ (1,801,000)	\$ (1,801,000)	\$ (1,801,000)
10	LCSWMA Revenue	(736,000)	(736,840)	(737,697)	(738,572)	(738,572)
11	Interest Revenue	(222,822)	(160,858)	(134,156)	(167,443)	(196,874)
12	Sources and Uses of Funds	(2,674,176)	(5,493,460)	1,973,833	2,413,875	1,465,440
13	Total Non-Rate Revenues	\$ (5,433,997)	\$ (8,192,158)	\$ (699,021)	\$ (293,140)	\$ (1,271,005)
14	Rate Revenue Requirement	\$ 24,137,357	\$ 24,627,475	\$ 25,127,551	\$ 25,637,787	\$ 25,645,479
15	Proposed Rate Increase	2.0%	2.0%	2.0%	2.0%	0.0%

2.6. Proposed Water Rates

2.6.1. EXISTING RATE STRUCTURE

CRW’s proposed water rates for FY 2020 through FY 2024 were developed by applying the proposed annual water rate increases proportionally to both the existing (FY 2019) Ready to Serve Charges and the Volumetric Rate. The proposed water rates for FY 2020 through FY 2024 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 in FY 2020 and in all future years.

Table 2-5. Proposed FY 2020 Water Rates – Existing Rate Structure

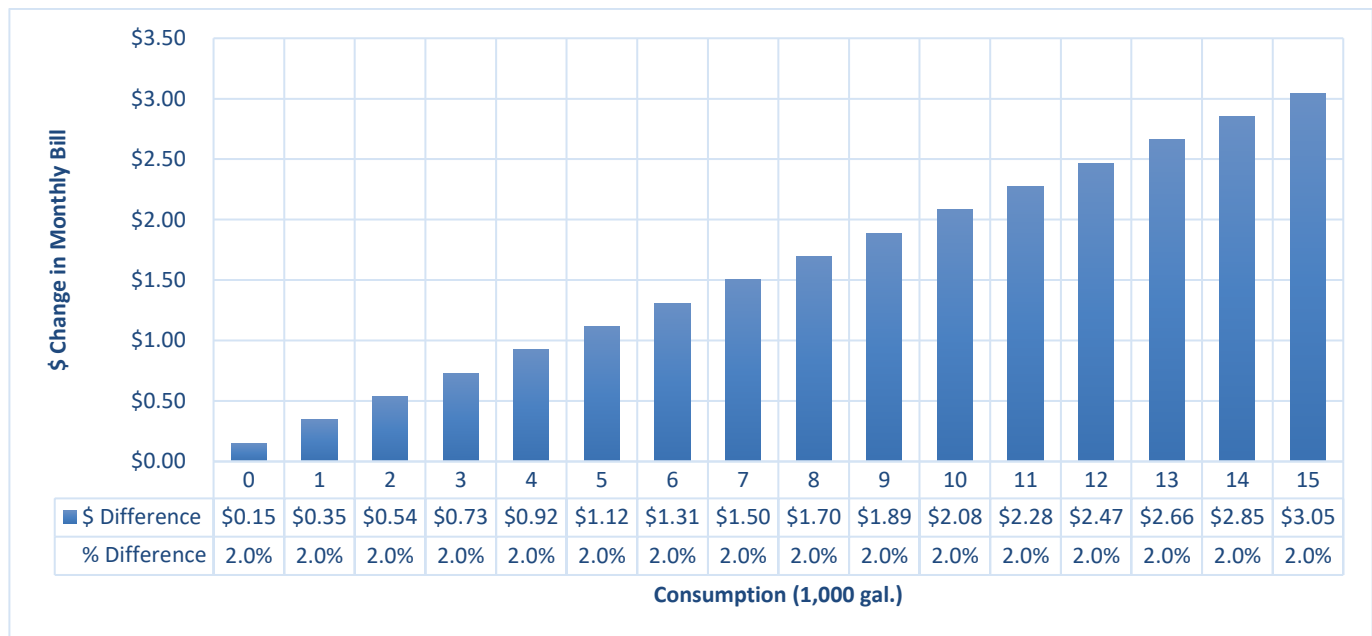
Ready to Serve Charge (Cost per Month)						
Meter Size	Existing FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
5/8"	\$7.62	\$7.77	\$7.93	\$8.09	\$8.25	\$8.25
3/4"	\$16.50	\$16.83	\$17.17	\$17.51	\$17.86	\$17.86
1"	\$33.10	\$33.76	\$34.44	\$35.13	\$35.83	\$35.83
1-1/2"	\$70.91	\$72.33	\$73.77	\$75.25	\$76.76	\$76.76
2"	\$130.00	\$132.60	\$135.25	\$137.96	\$140.72	\$140.72
3"	\$363.40	\$370.67	\$378.08	\$385.64	\$393.36	\$393.36
4"	\$649.97	\$662.97	\$676.23	\$689.75	\$703.55	\$703.55
6"	\$1,754	\$1,789	\$1,825	\$1,861	\$1,899	\$1,899
8"	\$3,119	\$3,181	\$3,245	\$3,310	\$3,376	\$3,376
10"	\$4,407	\$4,495	\$4,585	\$4,677	\$4,770	\$4,770
12"	\$7,020	\$7,160	\$7,304	\$7,450	\$7,599	\$7,599

Volumetric Rate (per 1,000 gal.)						
Consumption	Existing FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
All	\$9.65	\$9.84	\$10.04	\$10.24	\$10.45	\$10.45

2.6.2. CUSTOMER BILL IMPACTS

Anticipated residential customer bill impacts for FY 2020 resulting from the rates projected in Table 2-5 are provided in Figure 2-3 for a range of monthly consumption levels for customers with 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 \$0.73 to \$0.92, or 2.0 percent, per month, as compared to the existing (FY 2019) water rates. 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 2.0 percent.

Figure 2-3. Residential (5/8") Water Bill Impact (FY 2020)



2.7. Water System Cash Flow Projection

A cash flow forecast for the water system for FY 2020 through FY 2024 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 35). 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 35, 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 543 and 1,073 days of cash over the forecast period.

Projected debt service coverage levels are also shown in Table 2-6 (Lines 39-40). Net revenues are anticipated to be 1.56 times senior lien debt service in FY 2020, 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 2018	FY 2019	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Revenues									
1	Sales to Customers	\$ 23,340,272	\$ 23,664,075	\$ 23,811,917	\$ 24,137,357	\$ 24,627,475	\$ 25,127,551	\$ 25,637,787	\$ 25,645,479
2	Sales to LCSWMA	727,311	730,701	736,000	736,000	736,840	737,697	738,572	738,572
3	Penalties	796,779	500,000	647,853	500,000	500,000	500,000	500,000	500,000
4	Private Fire Protection Service	318,271	315,000	320,089	320,000	320,000	320,000	320,000	320,000
5	Interest Income	128,613	124,000	278,928	222,822	160,858	134,156	167,443	196,874
6	Interest Income - DSRF	155,929	189,000	257,408	239,000	239,000	239,000	239,000	239,000
7	Other Revenue	671,901	699,810	695,059	742,000	742,000	742,000	742,000	742,000
8	Total Revenues	\$ 26,139,076	\$ 26,222,586	\$ 26,747,254	\$ 26,897,178	\$ 27,326,173	\$ 27,800,404	\$ 28,344,802	\$ 28,381,925
Operating Expenses									
Personnel:									
9	Management	\$ 519,214	\$ 628,255	\$ 575,161	\$ 643,498	\$ 668,891	\$ 695,410	\$ 723,113	\$ 752,057
10	Distribution	1,039,054	1,183,405	1,098,330	1,180,821	1,227,214	1,275,656	1,326,249	1,379,099
11	Treatment	1,436,336	1,418,718	1,397,383	1,487,939	1,544,823	1,604,147	1,666,031	1,730,596
12	Other	119,918	60,000	100,000	100,000	106,000	112,360	119,102	126,248
Operations:									
13	Management	\$ 446,694	\$ 492,786	\$ 435,434	\$ 501,829	\$ 516,582	\$ 531,770	\$ 547,404	\$ 563,498
14	Distribution	237,386	555,492	351,396	161,725	166,253	170,908	175,694	180,613
15	Treatment	1,201,817	1,362,972	1,202,600	1,282,192	1,328,931	1,377,484	1,427,926	1,480,333
16	Other	180,091	281,695	219,221	391,787	403,205	415,078	427,424	440,264
Other Operating Expenses:									
17	CRW Administrative Fund Expense	\$ 2,569,403	\$ 3,171,648	\$ 2,735,838	\$ 3,097,714	\$ 3,184,450	\$ 3,273,615	\$ 3,365,276	\$ 3,459,504
18	Engineering Services	246,595	148,500	165,246	280,000	294,000	308,700	324,135	340,342
19	Total Operating Expenses	\$ 7,996,508	\$ 9,303,471	\$ 8,280,609	\$ 9,127,505	\$ 9,440,349	\$ 9,765,129	\$ 10,102,353	\$ 10,452,554
Other Expenses									
20	Transfers to Operating Reserve Account	\$ -	\$ -	\$ -	\$ -	\$ 31,000	\$ 58,394	\$ 60,622	\$ 62,946
21	Minor Capital Outlay	192,468	283,069	332,717	412,800	425,184	437,940	451,078	464,610
22	CRW Bank and Trustee Fees	2,500	2,500	2,500	3,000	3,000	3,000	3,000	3,000
Debt Service									
Existing Debt Service:									
23	Rev Ref Bonds, Series of 2008	\$ 2,808,453	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
24	Rev Ref Bonds, Series A of 2016	7,017,000	7,714,000	7,714,000	7,716,000	7,713,500	7,712,250	7,715,750	7,298,000
25	Rev Ref Bonds, Series B of 2016	-	-	-	-	-	-	-	-
26	Rev Bonds, Series of 2018	535,528	2,966,000	2,966,000	2,966,000	2,966,000	2,966,000	2,966,000	2,966,000
27	2015 PENNVEST Loan	309,049	309,049	309,049	309,049	309,049	309,049	309,049	309,049
New Debt Service:									
28	PENNVEST Pro-Fi Loan	-	-	-	-	-	142,161	280,281	1,022,163
29	Total Debt Service	\$ 10,670,030	\$ 10,989,049	\$ 10,989,049	\$ 10,991,049	\$ 10,988,549	\$ 11,129,460	\$ 11,271,080	\$ 11,595,212
30	Capital Projects Funded with Cash	\$ 5,645,688	\$ 8,648,486	\$ 6,726,386	\$ 9,037,000	\$ 11,931,551	\$ 4,432,650	\$ 4,042,794	\$ 4,338,162
31	Total Revenue Requirements	\$ 24,507,194	\$ 29,226,575	\$ 26,331,261	\$ 29,571,354	\$ 32,819,633	\$ 25,826,572	\$ 25,930,927	\$ 26,916,484
32	Revenues Over (Under) Expenditures	\$ 1,631,882	\$ (3,003,989)	\$ 415,993	\$ (2,674,176)	\$ (5,493,460)	\$ 1,973,833	\$ 2,413,875	\$ 1,465,440
33	Beginning Cash Balance				\$ 16,022,447	\$ 13,348,271	\$ 7,854,811	\$ 9,828,644	\$ 12,242,519
34	Revenues Over (Under) Expenditures				(2,674,176)	(5,493,460)	1,973,833	2,413,875	1,465,440
35	Ending Cash Balance¹				\$ 13,348,271	\$ 7,854,811	\$ 9,828,644	\$ 12,242,519	\$ 13,707,959
36	Ending Balance - Days O&M				526	299	362	436	472
37	Target Reserve Balance (140 days O&M)				\$ 3,550,752	\$ 3,672,414	\$ 3,798,717	\$ 3,929,859	\$ 4,066,049
38	Projected City Rate Increase				2.0%	2.0%	2.0%	2.0%	0.0%
39	DSC (Senior debt, 1.45x DS target)				1.56	1.57	1.56	1.56	1.48
40	DSC (All debt, 1.15x DS target)				1.56	1.57	1.56	1.56	1.48
41	Capital Projects - Cash Funded				\$ 9,037,000	\$ 11,931,551	\$ 4,432,650	\$ 4,042,794	\$ 4,338,162
42	Capital Projects - Conservation Easement Proceeds				-	5,150,000	3,822,325	-	-
43	Capital Projects - Existing Bond Proceeds				5,015,000	-	-	-	-
44	Capital Projects - Funded with PENNVEST Loans				-	-	14,216,060	13,812,069	8,497,592
45	Capital Projects - Total				\$ 14,052,000	\$ 17,081,551	\$ 22,471,035	\$ 17,854,863	\$ 12,835,754

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

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 Inter-Municipal Agreement between CRW and the Suburban wholesale municipalities (the “IMA”).³ As part of the wastewater system rate evaluation, an estimate of wastewater system 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. City retail wastewater rates were calculated based on the city retail revenue requirement. The wastewater system 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 total cash requirements of the wastewater system over 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, with the exception of a small number of Suburban connections whose wastewater flows through CRW’s collection system.

The Borough of Steelton operates its own collection system, maintains its own conveyance system, 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 reflects its proportionate share of the costs associated with the use of only CRW’s treatment facilities. The existing (FY 2019) wastewater rates for all customers are provided in Table 3-1.

Table 3-1. Existing (FY 2019) Retail and Wholesale Rates

Customer Class	Cost per 1,000 gal.
Retail Customers:	
Utilization	\$6.65
Maintenance	<u>\$1.00</u>
Total	\$7.65
Wholesale Customers:	
Suburban	\$4.39
Steelton	\$3.08

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.

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.

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.

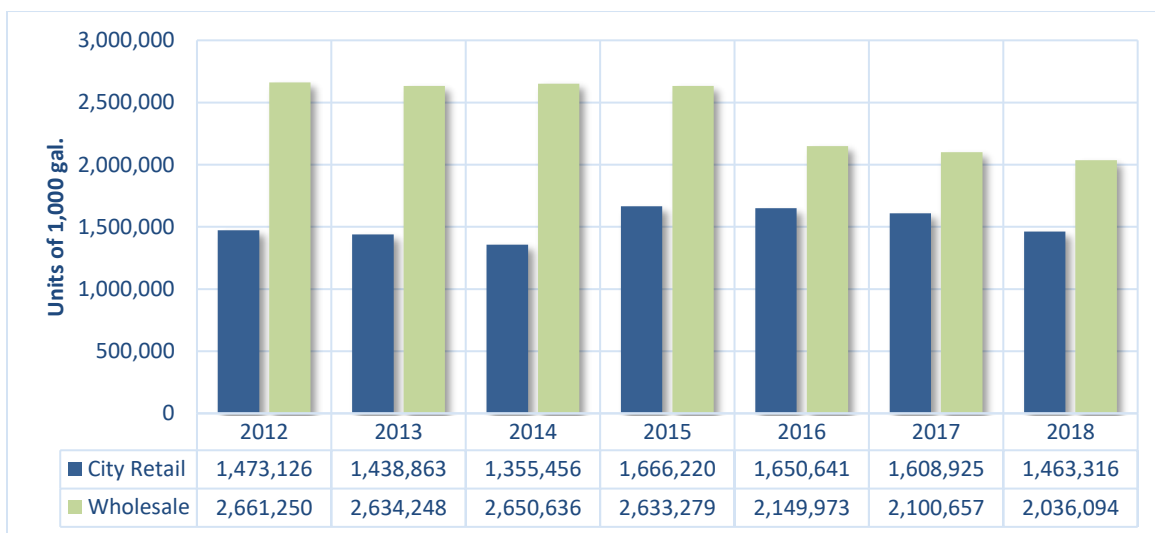
(d) The flat rate for Residences shall be based on the rate for customers with metered water service and an average water usage applicable to Residences in the service area of the Harrisburg Facilities.

(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 retail wastewater rate revenue in future years was projected based on estimates regarding future billed wastewater flows attributable to City and Suburban customers and anticipated future retail wastewater rates. The historical annual billed wastewater volume from City and Suburban customers from FY 2012 to FY 2018 is shown in Figure 3-1. This information was analyzed in order to estimate future annual changes in billed volume from retail and wholesale customers over the forecast period.

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



As shown in Figure 3-1, annual billed volume attributable to retail customers has been relatively flat since 2015, with a decline in FY 2018. 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. CRW should continue to monitor billed volume attributable to retail customers in FY 2019 to assess the impact on retail rate revenues. However, based on recent historical trends and discussions with CRW regarding the retail customer base, no change in billed consumption was assumed on a year-to-year basis over the forecast period.

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 in which billed water consumption is not available. 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; 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 2018 shows the level of consumption per residential account to be about 52,000 gallons per year. CRW will 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, as appropriate.

If the 65,000 gallons per ERU assumption had continued to be used in FY 2016, FY 2017, and FY 2018, total billable flows attributable to wholesale customers would have remained relatively stable from year-to-year. Therefore, billable flows from wholesale customers used to project wholesale revenues in each year of the forecast period were assumed to be unchanged from their FY 2018 level. As FY 2019 is not yet complete as of the date of this report, FY 2018 is the most recent year in which complete billing data is available from retail and wholesale customers and the information from this year has been used in the wholesale rate calculation for FY 2020.

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 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 August 2019, the balance in this account was approximately \$2.1 million, which is equivalent to about 62 days of cash.

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

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

level well above the minimum additional 180-day cash reserve target. Specifically, as of the beginning of FY 2020, operating cash on-hand was projected to be approximately \$10.9 million, or 330 days of cash, which exclude amounts held in the Operating Reserve Account. Therefore, the beginning level of operating cash in FY 2020 is anticipated to significantly exceed CRW's minimum cash reserve target.

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, and 2017), and the Series 2017 Revenue and Revenue Refunding Bonds. In addition, during 2018, CRW received a funding offer from PENNVEST for a loan related to the Front Street pump station project. As of the date of this report, CRW continues to draw on the committed balance and it is expected that this loan will close in FY 2021. Until then, CRW will continue to pay interest on the cumulative amount drawn.

The required level of debt service coverage on outstanding debt is 1.20 times, as described in the Wastewater Trust Indenture.

“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 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 was assumed to include the 2017 Revenue Bond issues and the 2009 and 2014 PENNVEST loans. The 2017 PENNVEST loan, Front Street pump station loan and planned PENNVEST loan were assumed to hold a subordinate claim to the net revenues of the system.

3.4. Wastewater Revenues and Expenses

3.4.1. REVENUES

CRW's wastewater 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 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, contractor waste fees, electricity sales, sludge handling charges, pretreatment fees, and interest income. Historically, these miscellaneous revenues have comprised approximately 5.0 to 10 percent of the revenues of the system. With the exception of interest income, these revenues were projected in future years based on their FY 2020 budgeted amounts. Interest income was calculated based on the average annual balance of available cash and an interest earnings rate of

approximately 1.5 percent per year. A summary of the historical and projected wastewater system revenues is provided at the end of this section in Table 3-13.

3.4.2. EXPENSES

3.4.2.1. Operation and Maintenance Expenses

Wastewater system expenses include O&M expenses and minor capital expenditures. In general, 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 \$3.2 million in FY 2020. Individual expenses were classified as labor, benefits, insurance, electricity, chemicals, professional services, minor capital, or general, and were escalated in future years based on 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 3-13.

Table 3-2. O&M Cost Escalation Factors

Expense Category	Escalation Rate
Labor	3.0%
Benefits	6.0%
Insurance	3.0%
Electricity	3.0%
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 schedule of future capital project costs as provided by CRW. The annual capital project costs related to collection, conveyance, pump stations, treatment plant, and other miscellaneous capital work anticipated to be incurred over the forecast period are summarized in Table 3-3. The capital plan beyond FY 2020 is subject to change as CRW continues to negotiate its Long-Term Control Plan with the U.S. Environmental Protection Agency. However, the capital project costs summarized below do not include stormwater-related projects as it is anticipated that those projects will be funded with the planned stormwater fee. Capital project costs in FY 2021 and beyond were escalated using factor of 3.0 percent per year to reflect anticipated future cost inflation.

Table 3-3. FY 2020 Wastewater System Capital Plan

Project Type	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Collection	\$6,882,500	\$5,752,550	\$5,463,635	\$5,627,544	\$5,796,370
Conveyance	2,069,000	22,948,400	21,218,000	0	0
Pump Stations	10,473,000	0	0	0	0
Treatment Plant	3,412,000	8,319,825	11,523,708	3,896,118	0
Miscellaneous	1,115,720	635,345	510,075	912,284	747,411
Total	\$23,952,220	\$37,656,120	\$38,715,418	\$10,435,946	\$6,543,781

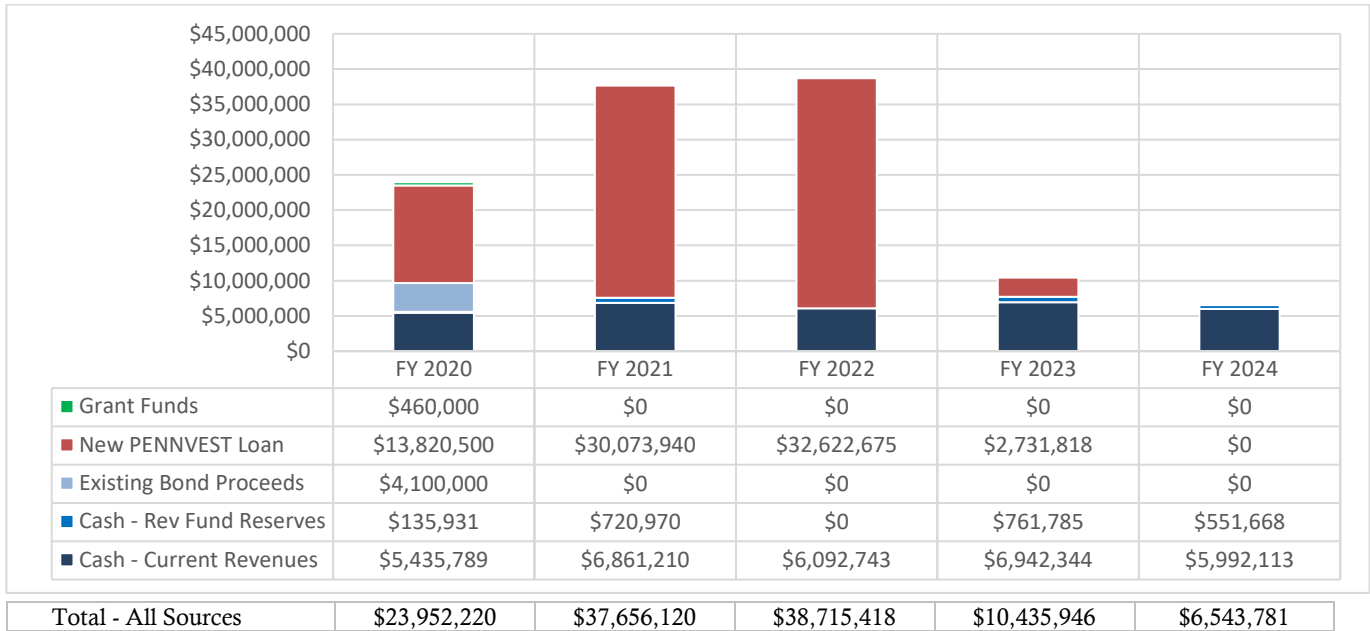
Note: Capital project costs shown in this table were provided by CRW in 2020 dollars and then escalated at a rate of 3.0 percent per year in future years for financial planning purposes.

3.5. Capital Project Funding

The financial plan that was prepared assumed funding of wastewater capital project costs with a mix of cash, grant monies, existing bond proceeds, and new debt. Cash to fund capital projects was assumed to come from current revenues and reserves held in the Revenue Fund. No cash was assumed to come from the Operating Reserve Account or the Rate Stabilization Fund. This financial plan scenario was prepared based on information 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.

A summary of the capital project funding plan is shown in Figure 3-2. Revenue Fund reserves were assumed to fund about \$2.2 million, or roughly 1.9 percent, of the total capital spend over the forecast period. In addition, new debt in the form of a new PENNVEST loan was assumed to be issued to fund project costs in each year of the forecast period, except FY 2024. Over the forecast period, cash was assumed to be used to fund roughly 28.6 percent of the capital project costs, grant monies were assumed to fund 0.4 percent, existing bond proceeds were assumed to fund around 3.5 percent, and the new PENNVEST loan was assumed to be used to fund the remaining 67.5 percent. The new PENNVEST loan was assumed to hold a subordinate claim to the net revenues of the wastewater system. Other loan assumptions included assuming interest-only payments in FY 2020 through FY 2022 based on the anticipated amount to be drawn on the loan, one-half of the full debt service payment due in FY 2023, with level annual debt service payments thereafter (except for the final year), an annual interest rate of 1.0 percent, a repayment term of 20 years, and issuance costs of 0.85 percent.

Figure 3-2. Capital Project Funding Sources



3.6. Suburban Wholesale Wastewater Rate Calculation

3.6.1. COST CATEGORIZATION

The FY 2020 rate revenue requirement was allocated to Treatment, Conveyance, Collection, and City-Only cost categories in order to calculate the Suburban wholesale rates for FY 2020. The costs included in these categories are discussed below:

- Treatment – Costs are related to wastewater treatment and are shared by all users of the system.
- Conveyance – 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 and are not associated with other users of the system.

In addition, general operational and management related costs were allocated among the four categories listed above based on the type and nature of the expense. Billing and collections-related operating expenses were allocated to City customers. Other administrative expenses were allocated based on the proportion of non-administrative costs allocated to each category. Operating expenses that were stormwater-related, but not relocated to the stormwater fund to be recovered with the planned stormwater fee, were allocated to either “Collection” or “City-Only”. Not all stormwater operating expenses were relocated to the stormwater fund, as the planned stormwater fee will only be in effect for one-half of the fiscal year in 2020. This fee is expected to be in effect for the full fiscal year in all future years.

The capital rate revenue requirement in FY 2020 included costs attributable to existing debt service, new debt service, and cash-funded capital. Capital projects that were planned to be completed during the upcoming fiscal year included, but were not limited to, the following:

- Projects related to anaerobic digester roof repairs and cogeneration improvements. These projects were allocated to the “Treatment” category.
- Projects related to Front Street pump station upgrades and Arsenal Boulevard sewer improvements. These projects were allocated to the “Conveyance” cost category.
- Various projects related to collection system rehab. These projects were allocated to the “Collection” cost category.
- Projects related to green stormwater infrastructure were not included in the wastewater system budget for FY 2020 as provided by CRW. These projects are anticipated to be funded with the planned stormwater fee in FY 2020 and all future years.

A summary of the resulting rate revenue requirement categorizations for FY 2020 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 was approximately \$1.4 million.

Table 3-4. Summary of Cost Categorization Results

Description	Treatment	Conveyance	Collection	City-Only	Total
Operating Costs	\$6,975,660	\$2,029,493	\$2,646,585	\$572,535	\$12,224,272
Operating Related Non-Rate Revenue Offset	<u>-922,022</u>	<u>-34,248</u>	<u>-56,446</u>	<u>-323,288</u>	<u>-1,336,033</u>
O&M Revenue Requirement	\$6,053,638	\$1,995,245	\$2,590,139	\$249,247	\$10,888,269
Allocation %	55.6%	18.3%	23.8%	2.3%	100.0%
Capital Costs	\$4,774,828	\$1,688,227	\$3,610,398	\$0	\$10,073,453
Capital Related Non-Rate Revenue Offset	<u>-43,986</u>	<u>-11,616</u>	<u>-16,898</u>	<u>0</u>	<u>-72,500</u>
Capital Revenue Requirement	\$4,730,842	\$1,676,611	\$3,593,500	\$0	\$10,000,953
Allocation %	47.3%	16.8%	35.9%	0.0%	100.0%
Total	\$10,784,480	\$3,671,856	\$6,183,638	\$249,247	\$20,889,222

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 3-5.

Table 3-5. 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	1,463,316	1,463,316	2,932,390	4,395,706
Penbrook Borough	1,289	58,017	8,318	66,334	132,930	199,264
Paxtang Borough	643	28,943	5,364	34,307	68,749	103,056
Swatara Township-via Harrisburg	0	0	373,488	373,488	748,446	1,121,935
Swatara Township-via Steelton	0	0	65,039	65,039	130,334	195,373
Lower Paxton Township	12,641	568,850	172,452	741,302	1,485,521	2,226,824
Susquehanna Township	10,753	483,893	146,138	630,031	1,262,540	1,892,571
Steelton Borough	0	0	125,592	125,592	251,679	377,271
Total	25,327	1,139,703	2,359,708	3,499,411	7,012,589	10,512,000

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 2018, less billed volume for FY 2018. 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 2018. 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 also implicitly distributed proportionally to billed flows.

As shown in Table 3-5, an estimate of the amount of consumption per equivalent residential unit (“ERU”) was made and used as a proxy of flow for the proportion of each wholesale municipality’s customer base where metered consumption was not available. As shown in Table 3-6, the five-year average of consumption per residential account from FY 2014 to FY 2018 for CRW residential customers was approximately 50,400 gallons per year, which is comparable to the assumption of 45,000 gallons per year for one ERU that was assumed.

Table 3-6. 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.)
2014	766,620	18,440	41.6
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
5-Year Historical Average			50.4

Source: Historical billing and customer data provided by CRW.

The units of service were distributed to the four cost categories based on each customer’s use of the wastewater system. This is shown in Table 3-7. In addition, the unit cost of service was calculated by dividing the categorized costs 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 3-8.

Table 3-7. 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 3-8. Unit Cost of Service

Description	Treatment	Conveyance	Collection	City-Only
Units of Service (1,000 gal.)	3,499,411	3,308,779	1,463,316	1,463,316
Operating Revenue Requirement	\$6,053,638	\$1,995,245	\$2,590,139	\$249,247
Capital Revenue Requirement	\$4,730,842	\$1,676,611	\$3,593,500	\$0
Operating Unit Cost (\$/1,000 gal.)	\$1.73	\$0.60	\$1.77	\$0.17
Capital Unit Cost (\$/1,000 gal.)	\$1.35	\$0.51	\$2.46	\$0.00

3.6.3. WHOLESALE RATE CALCULATION

The FY 2020 wholesale rates for Suburban customers were calculated using the unit cost of service for each cost category and the service provided to each customer. The results are shown in Table 3-9. 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. As shown in the table, the Suburban wholesale rate was calculated to be \$4.47 per 1,000 gallons, which is \$0.08, or 1.8 percent, higher than the existing (FY 2019) rate. The wholesale rate for Steelton was calculated to be \$3.28 per 1,000 gallons, which is \$0.20, or 6.6 percent, higher than the existing (FY 2019) 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 Suburban municipalities should pay the unit collection rate of \$4.23 per 1,000 gallons that is shown in Table 3-9 (\$1.77 per 1,000 gallons for O&M, plus \$2.46 per 1,000 gallons for Capital), in addition to the calculated treatment and conveyance rates. Furthermore, no adjustment was made to reflect an estimated true-up of the FY 2019 wholesale rates to both Suburban and Steelton customers, as it is anticipated that such a true-up will be completed once actual costs and billing data for FY 2019 is available.

Table 3-9. Calculated Wholesale Rates (FY 2020)

Description	City	Suburban ¹	Steelton ²
O&M Rate:			
Treatment	\$1.73	\$1.73	\$1.73
Conveyance	\$0.60	\$0.60	\$0.00
Collection	\$1.77	\$0.00	\$0.00
City-Only	<u>\$0.17</u>	<u>\$0.00</u>	<u>\$0.00</u>
Total O&M Rate per 1,000 gal.	\$4.27	\$2.33	\$1.73
Capital Charge (Lease Rental Rates):³			
Treatment	\$1.35	\$1.55	\$1.55
Conveyance	\$0.51	\$0.58	\$0.00
Collection	\$2.46	\$0.00	\$0.00
City-Only	\$0.00	\$0.00	\$0.00
Other ⁴	<u>-\$0.59</u>	<u>\$0.00</u>	<u>\$0.00</u>
Total Charge per 1,000 gal.	\$3.72	\$2.14	\$1.55
Total Rate per 1,000 gal.	\$7.99	\$4.47	\$3.28
Existing Rate per 1,000 gal.	\$7.65	\$4.39	\$3.08
Percent Change	4.5%	1.8%	6.6%

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 adjustment to the unit costs per Section 2b of Schedule A of the Intermunicipal Agreement.

⁴Use of cash reserves and other adjustments.

Based on the calculated wholesale rates shown in Table 3-9 and the estimated wholesale customer units of service shown in Table 3-5, wastewater treatment and conveyance revenue requirements were allocated to each of the different wholesale customers. Penbrook Borough, Paxtang Borough, Swatara Township (via Harrisburg), Lower 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 FY 2020 revenue requirement that was allocated to each wholesale customer is shown in Table 3-10.

Table 3-10. 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	66,334	\$ 217,881	\$1.19	66,334	\$ 78,655	\$ 296,536
Paxtang Borough	\$3.28	34,307	112,684	\$1.19	34,307	40,679	153,364
Swatara Township (via Harrisburg)	\$3.28	373,488	1,226,754	\$1.19	373,488	442,860	1,669,614
Swatara Township (via Steelton)	\$3.28	65,039	213,626	\$0.00	-	-	213,626
Lower Paxton Township	\$3.28	741,302	2,434,870	\$1.19	741,302	878,991	3,313,861
Susquehanna Township	\$3.28	630,031	2,069,389	\$1.19	630,031	747,052	2,816,441
Steelton Borough	\$3.28	125,592	412,518	\$0.00	-	-	412,518
Total			\$ 6,687,722			\$ 2,188,237	\$ 8,875,959

¹Represents the total of the O&M (\$1.73) and the Capital (\$1.55) unit rates under the Treatment line items in Table 3-9.

²Represents the total of the O&M (\$0.60) and the Capital (\$0.58) unit rates under the Conveyance line items in Table 3-9.

3.7. Wastewater System Retail Rate Revenue Requirements

A summary of the rate revenue requirements for City customers is shown in Table 3-11. Rate revenue requirements include O&M expenses, debt service, minor capital outlays, and cash-funded capital project expenditures. 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 in Table 3-11 (Line 9) and serves to offset the City’s rate revenue requirements. 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 3-11, an increase to City retail rate revenue is anticipated to be needed each year, from FY 2020 through FY 2024, to fund the annual costs of the system and to meet fiscal policy targets related to cash reserves and debt service coverage. The rate revenue increases are projected to be 4.5 percent per year from FY 2020 through FY 2023, and 5.5 percent in FY 2024. The wastewater rate increases in FY 2021 through FY 2024 are subject to change.

If the stormwater fee is not implemented on July 1, 2020 as currently planned, or at a level that is less than currently planned on that date or in any other year of the forecast period, then it is possible that the rate increases projected in Table 3-11 would need to increase to fund stormwater related costs that would otherwise be funded with the planned stormwater fee. For example, all things equal, if there was no stormwater fee in any year of the forecast period, it is estimated that the annual retail wastewater rate revenue increases would be approximately 13.0 percent per year from FY 2020 to FY 2024. These increases are between 7.5 and 8.5 percentage points higher than the retail rate increases projected in Table 3-11.

Table 3-11. FY 2020 Wastewater Rate Revenue Requirement

Line No.	Description	Fiscal Year Ending December 31				
		FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
O&M Expenses and Transfers						
1	Operating and Maintenance Expenses	\$ 11,915,222	\$ 10,808,394	\$ 11,145,222	\$ 11,562,198	\$ 11,995,695
2	Minor Capital	309,050	318,322	327,871	337,707	347,838
3	Transfer to Operating Reserve Account	-	-	-	-	40,693
4	Total O&M and Transfers Out	\$ 12,224,272	\$ 11,126,716	\$ 11,473,093	\$ 11,899,905	\$ 12,384,227
Capital Expenditures						
5	Debt Service	\$ 4,501,733	\$ 5,300,113	\$ 5,647,761	\$ 6,922,100	\$ 8,850,960
6	Cash Funded Capital	5,571,720	7,582,180	6,092,743	7,704,129	6,543,781
7	Total Capital Expenditures	\$ 10,073,453	\$ 12,882,293	\$ 11,740,504	\$ 14,626,229	\$ 15,394,741
8	Total O&M and Capital	\$ 22,297,725	\$ 24,009,009	\$ 23,213,597	\$ 26,526,134	\$ 27,778,967
Less: Non-Rate Revenues						
9	Wholesale Revenue	\$ (8,875,959)	\$ (9,475,787)	\$ (10,116,151)	\$ (10,799,791)	\$ (11,529,630)
10	Miscellaneous Revenue	(1,204,500)	(1,204,500)	(1,204,500)	(1,204,500)	(1,204,500)
11	Interest Revenue	(204,003)	(195,940)	(201,187)	(206,050)	(193,690)
12	Sources and Uses of Funds	(135,931)	(720,970)	1,278,585	(761,785)	(551,668)
13	Total Non-Rate Revenues	\$ (10,420,393)	\$ (11,597,197)	\$ (10,243,253)	\$ (12,972,125)	\$ (13,479,488)
14	Rate Revenue Requirement	\$ 11,877,332	\$ 12,411,812	\$ 12,970,344	\$ 13,554,009	\$ 14,299,479
15	Proposed Retail Wastewater Rate Adjustment	4.5%	4.5%	4.5%	4.5%	5.5%

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 2020 through FY 2024 are shown in Table 3-12. While recent trends have shown a slight decline in billed wastewater flows from Suburban wholesale customers, no change in the actual billed volume from these customers in FY 2018 was assumed in future years. The wholesale wastewater rates shown for FY 2021 through FY 2024 were projected by smoothing the calculated rates over these years in order to recover the total costs that were projected to be allocated to wholesale customers over these four fiscal years (\$41.9 million). This resulted in an annual increase of about 6.8 percent per year in the wholesale rates from FY 2021 to FY 2024.

Table 3-12. Proposed Retail and Wholesale Wastewater Rates

Retail Volumetric Rate (1,000 gal.)						
Description	Existing FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
All Retail Customers	\$7.65	\$7.99	\$8.35	\$8.73	\$9.12	\$9.62
Wholesale Volumetric Rate (1,000 gal.)						
Municipality	Existing FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
All, except Steelton	\$4.39	\$4.47	\$4.77	\$5.09	\$5.44	\$5.81
Steelton	\$3.08	\$3.28	\$3.51	\$3.74	\$4.00	\$4.27

As shown in Table 3-12, two components comprise the volumetric rate: (1) a utilization component and (2) a maintenance component. Each component is assessed on a per 1,000 gallons basis. Authorizing language for the

utilization component is included in the City of Harrisburg’s municipal code in Section 9-503.2. According to the code, this rate component is assessed to recover costs associated with the general use of the wastewater system. Authorizing language for the maintenance component is included in Section 9-505.1. Regarding the assessment of this rate, this section of the code states:

“An annual charge for the maintenance, repair, and reconstruction of the sewage collection, transmission, and treatment facilities of the City is hereby imposed on all persons, including schools, churches, hospitals, charitable institutions, and all government entities, at the rate of 15% of the amount of the sanitary sewer rental payable by such persons under the provisions of Chapter 9-503.”

It is recommended that beginning in FY 2020, CRW combine the utilization rate and the maintenance rate into a single volumetric wastewater rate. This recommendation is for three main reasons.

1. First, from a customer’s perspective, all monthly usage is assessed the same utilization and maintenance rates; therefore, only one volumetric rate is needed. For example, if CRW utilized volumetric rate tiers (i.e., the unit rate for one usage block differs from the unit rate of one or more other usage blocks), then more than one volumetric rate would be needed. However, this is not the case, as CRW assesses a single uniform volumetric rate to all of a customer’s monthly use.
2. Second, while the maintenance rate component generates revenues to pay for maintenance, repair, and reconstruction costs, the actual amount of these costs may be more or less than the amount of revenue generated. In other words, it’s likely that in some years utilization rate revenues may be used to fund maintenance, repair, and reconstruction costs, while in others, maintenance rate revenues may be used to fund other operating costs. Furthermore, CRW’s accounting system is not setup to track maintenance rate funded costs separately from other operating costs.
3. Lastly, the Wastewater Trust Indenture establishes several separate and distinct funds and accounts, as well as a flow of funds stating the order in which certain types of expenses are paid and transfers to other funds and accounts are to be made. Based on a review of the Indenture’s provisions, the Indenture does not provide for a separate accounting for, or payment of, maintenance, repair, and reconstruction costs separately from other costs of the system. The Indenture also does not state that revenues from the utilization rate and the maintenance rate need to be accounted for separately or can only be used to pay for certain types of expenses.

3.8.2. ALTERNATIVE RATE STRUCTURE

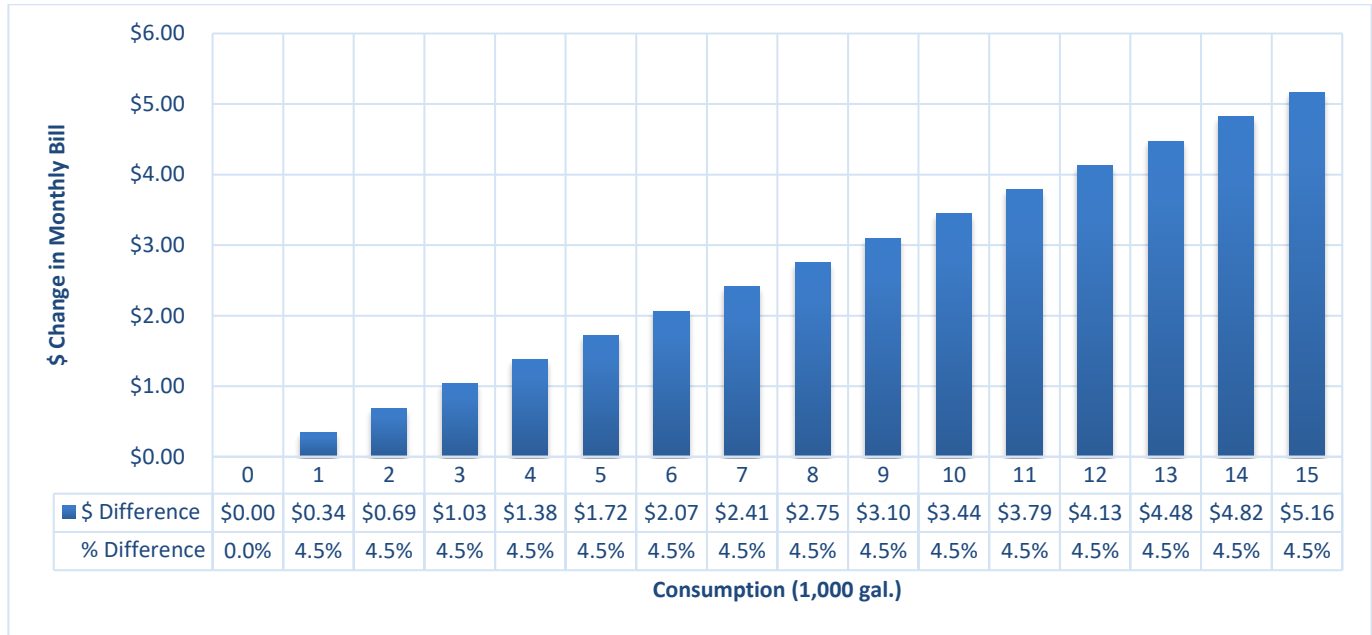
As an alternative to the current rate structure, CRW could consider adding a fixed charge to recover a portion of the capital costs of the system on a fixed revenue basis. Some wastewater utilities recover a portion of the cost of treating I&I from a fixed charge and the remaining portion from a volume charge to reflect that the number of connections in the wastewater system contributes to the greater potential for infiltration through poor joints and cracked pipes, and the inflow through roof and foundation drains. In addition, some wastewater utilities recover a portion of annual debt service with a fixed charge to better match fixed costs with a fixed revenue stream, though introducing a fixed charge to the wastewater rate structure could exacerbate affordability issues in the future. However, establishing a fixed charge that is tiered by customer usage or meter size could help to alleviate some of these affordability concerns. These rate structure alternatives could be considered as part of CRW’s customer assistance program that it is planning to implement in FY 2020.

3.9. Retail Customer Bill Impacts

Anticipated customer bill impacts associated with the calculated FY 2020 retail wastewater rates for City customers are provided in Figure 3-3. This figure shows the anticipated bill impacts across a range of consumption for a residential customer with 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 \$1.03 to \$1.38, or 4.5 percent, per month, as compared to the existing (FY 2019) 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 4.5 percent.

Figure 3-3. Retail Residential (5/8") Wastewater Bill Impact (FY 2020)



3.10. Wastewater System Cash Flow Projection

A cash flow forecast for the wastewater system is shown in Table 3-13. 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 39). 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 unrestricted cash reserves of at least 240 days of O&M expenses over the forecast period (at least 180 days, as shown on Line 39, plus at least 60 days held separately in the Operating Reserve Account). Note, however, that the projected ending cash levels do not reflect any true-up payments to suburban customers related to potential true-up settlements from prior years. Therefore, the projected ending cash balances over the forecast period may be lower than shown in Table 3-13. The projected debt service coverage levels are also shown in Table 3-13 (Lines 43-44). 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.

It should be noted that stormwater related costs were removed from the forecast from within the Personnel – Field Maintenance (Line 13), Operations – Field Maintenance (Line 18), and CRW Admin Fund Expense (Line 20) line items. In general, more costs were removed from these line items in FY 2021 through FY 2024, as the stormwater fee is expected to be in effect for the full fiscal year during these years. 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 planned stormwater fee in each year of the forecast period.

Table 3-13. Wastewater System Cash Flow Projection

Line No.	Description	Actual FY 2018	Budget FY 2019	Projected FY 2019	Budgeted FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Revenues									
1	Sales to City Customers	\$10,280,154	\$11,365,868	\$11,157,646	\$11,877,332	\$12,411,812	\$12,970,344	\$13,554,009	\$14,299,479
2	Sales to Public Authorities	8,445,194	8,962,368	8,962,368	8,875,959	9,475,787	10,116,151	10,799,791	11,529,630
3	Penalties	362,899	275,000	309,750	275,000	275,000	275,000	275,000	275,000
4	Sludge Handling	75,978	60,000	71,041	65,000	65,000	65,000	65,000	65,000
5	Electricity Sales	68,755	50,000	45,280	45,000	45,000	45,000	45,000	45,000
6	Interest Income	237,731	93,107	239,144	204,003	195,940	201,187	206,050	193,690
7	Interest Income - DSRF	-	57,000	70,910	71,000	71,000	71,000	71,000	71,000
8	Other Revenue	844,498	670,000	902,476	748,500	748,500	748,500	748,500	748,500
9	Total Revenues	\$20,315,209	\$21,533,343	\$21,758,615	\$22,161,794	\$23,288,039	\$24,492,182	\$25,764,349	\$27,227,300
Operating Expenses									
Personnel:									
10	Management	\$ 656,496	\$ 835,477	\$ 772,067	\$ 851,189	\$ 883,479	\$ 917,143	\$ 952,246	\$ 988,858
11	Treatment	1,434,626	1,551,775	1,524,948	1,577,696	1,638,652	1,702,255	1,768,633	1,837,920
12	Maintenance	656,734	633,995	633,936	650,955	676,578	703,335	731,283	760,480
13	Field Maintenance	1,146,944	1,323,043	1,400,326	995,584	559,551	579,892	601,056	623,081
14	Other	111,497	268,000	111,500	111,500	118,190	125,281	132,798	140,766
Operations:									
15	Management	\$ 529,225	\$ 551,277	\$ 516,533	\$ 605,329	\$ 623,094	\$ 641,381	\$ 660,206	\$ 679,583
16	Treatment	2,155,240	2,266,425	2,074,675	2,307,973	2,381,566	2,457,638	2,536,277	2,617,574
17	Maintenance	165,833	162,700	140,723	167,500	172,190	177,011	181,968	187,063
18	Field Maintenance	148,262	266,642	340,810	465,916	125,555	100,111	141,210	184,653
19	Other	370,052	447,200	385,995	953,450	994,675	1,037,893	1,083,201	1,130,702
Other Operating Expenses:									
20	CRW Admin Fund Expense	\$ 2,683,726	\$ 3,301,104	\$ 2,846,783	\$ 3,223,630	\$ 2,630,364	\$ 2,698,781	\$ 2,768,821	\$ 2,840,515
21	Shared Services	503,736	650,000	-	-	-	-	-	-
22	Total Operating Expenses	\$10,562,371	\$12,257,638	\$10,748,296	\$11,910,722	\$10,803,894	\$11,140,722	\$11,557,698	\$11,991,195
Other Expenses									
23	Transfers to Operating Reserve	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 40,693
24	Minor Capital Outlay	300,588	291,100	261,100	309,050	318,322	327,871	337,707	347,838
25	CRW Bank and Trustee Fees	4,500	3,000	324	4,500	4,500	4,500	4,500	4,500
Debt Service									
Existing Debt Service									
26	2009 PENNVEST Loan	114,120	114,120	114,120	114,120	114,120	114,120	114,120	114,120
27	2014 PENNVEST Loan	1,186,527	1,186,527	1,186,527	1,186,527	1,186,527	1,208,649	1,210,660	1,210,660
28	2017 PENNVEST Loan	9,854	64,166	64,166	197,427	197,427	197,427	197,427	199,047
29	Series 2017 Rev and Ref Bonds	2,851,050	2,845,050	2,845,050	2,851,450	2,848,950	2,848,250	2,853,250	2,851,000
New Debt Service									
30	Revenue Bonds	\$ -	\$ 627,436	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
31	2018 PENNVEST Loan	-	68,167	-	117,014	617,155	617,155	617,155	617,155
32	2023 PENNVEST Pro-Fi Loan	-	-	-	35,195	335,934	662,161	1,929,490	3,858,979
33	Total Debt Service	\$ 4,161,551	\$ 4,905,466	\$ 4,209,863	\$ 4,501,733	\$ 5,300,113	\$ 5,647,761	\$ 6,922,100	\$ 8,850,960
34	Capital Projects Funded with Cash	\$ 4,000,000	\$ 4,500,000	\$ 4,500,000	\$ 5,571,720	\$ 7,582,180	\$ 6,092,743	\$ 7,704,129	\$ 6,543,781
35	Total Revenue Requirements	\$19,029,010	\$21,957,204	\$19,719,583	\$22,297,725	\$24,009,009	\$23,213,597	\$26,526,134	\$27,778,967
36	Revenues Over (Under) Expenditures	\$ 1,286,199	\$ (423,861)	\$ 2,039,032	\$ (135,931)	\$ (720,970)	\$ 1,278,585	\$ (761,785)	\$ (551,668)
37	Beginning Balance				\$10,907,879	\$10,771,948	\$10,050,978	\$11,329,563	\$10,567,778
38	Revenues Over (Under) Expenditures				(135,931)	(720,970)	1,278,585	(761,785)	(551,668)
39	Ending Balance¹				\$10,771,948	\$10,050,978	\$11,329,563	\$10,567,778	\$10,016,110
40	Ending Balance - Days O&M				325	335	366	329	301
41	Target Reserve Balance (180 days O&M)				\$ 5,957,611	\$ 5,404,197	\$ 5,572,611	\$ 5,781,099	\$ 5,997,847
42	Projected City Rate Increase				4.5%	4.5%	4.5%	4.5%	5.5%
43	DSC (Senior debt, 1.40x DS target)				2.34	2.88	3.07	3.27	3.51
44	DSC (All debt, 1.15x DS target)				2.16	2.26	2.27	1.97	1.66
45	Capital Projects - Cash Funded				\$ 5,571,720	\$ 7,582,180	\$ 6,092,743	\$ 7,704,129	\$ 6,543,781
46	Capital Projects - Funded with Grant Proceeds				460,000	-	-	-	-
47	Capital Projects - Funded with Series 2017 Bonds				4,100,000	-	-	-	-
48	Capital Projects - Funded with PENNVEST Loans				13,820,500	30,073,940	32,622,675	2,731,818	-
49	Capital Projects - Total				\$23,952,220	\$37,656,120	\$38,715,418	\$10,435,946	\$ 6,543,781

¹Excludes cash held in the Operating Reserve Account and Rate Stabilization Fund, as well as any existing bond or loan proceeds.

4. 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 residential customers. 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 Pittsburgh, PA/ALCOSAN
- Steelton Borough, PA
- Susquehanna Township, PA (served by SUEZ Water)
- Swatara Township, PA (served by SUEZ Water)

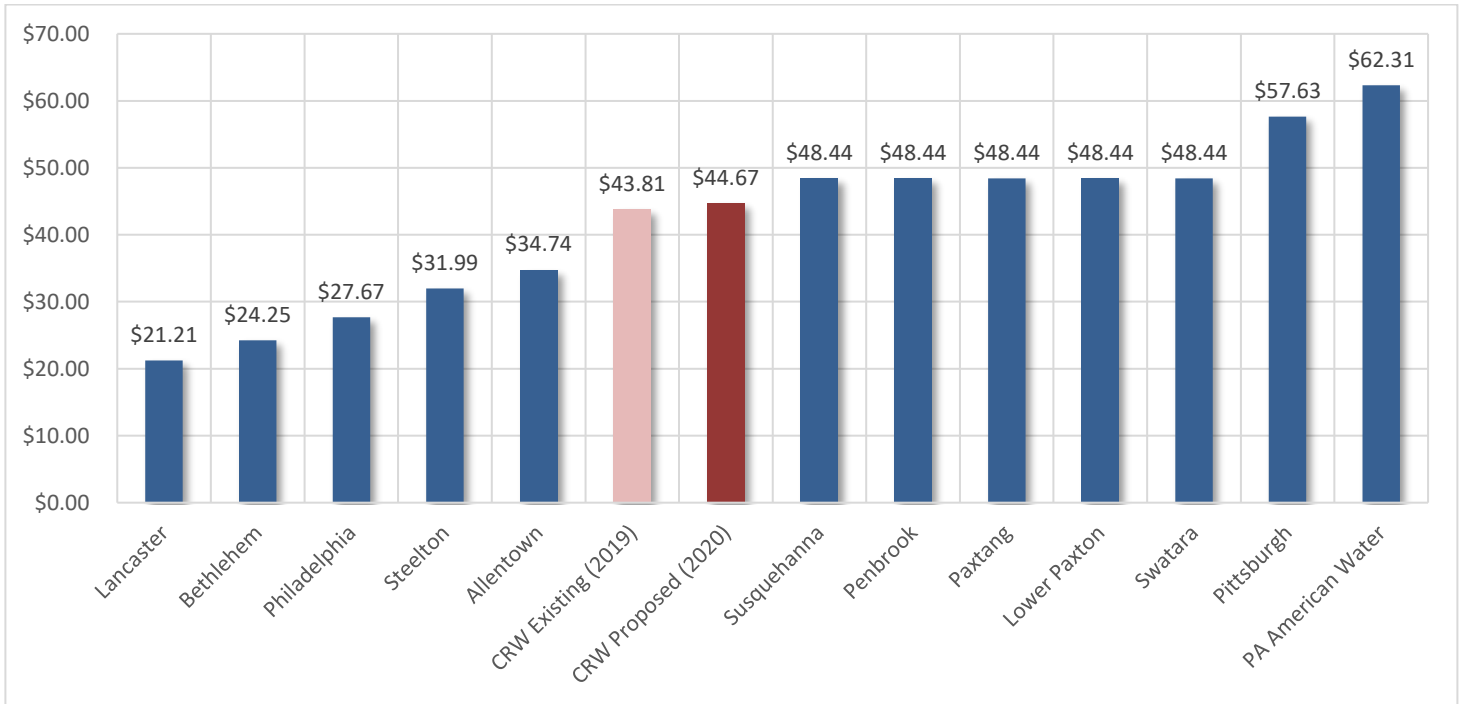
Monthly bills were estimated for residential customers based on an assumed amount of water consumption, wastewater flow, and meter size. To calculate the estimated monthly bills, a 5/8-inch meter and 3,750 gallons (5.01 hundred cubic feet) of water consumption and wastewater flow were assumed.

4.1. Water Bill Comparison

The comparison of estimated residential monthly water bills is shown in Figure 4-1. CRW's existing (FY 2019) water rates, as well as its proposed FY 2020 water rates, were included in the comparison. As shown in the figure, CRW's estimated monthly bill under existing (FY 2019) and proposed FY 2020 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.⁵

⁵ SUEZ Water bills are based on proposed rates as of November 2019.

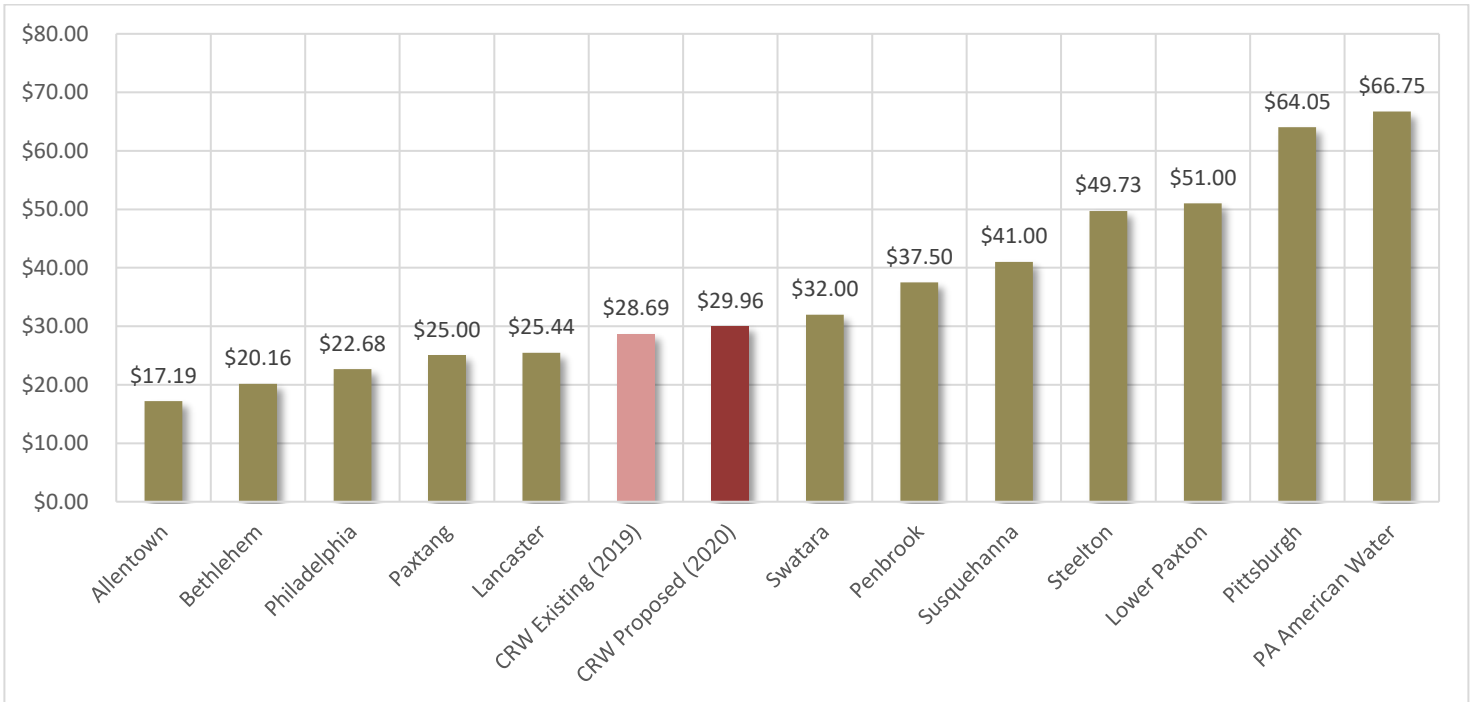
Figure 4-1. Estimated Monthly Residential Water Bill Comparison



4.2. Wastewater Bill Comparison

The comparison of estimated monthly wastewater bills is shown by customer type in Figure 4-2. As shown in the figure, CRW’s estimated monthly residential wastewater bill under its existing and proposed retail wastewater rates was less than seven 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.

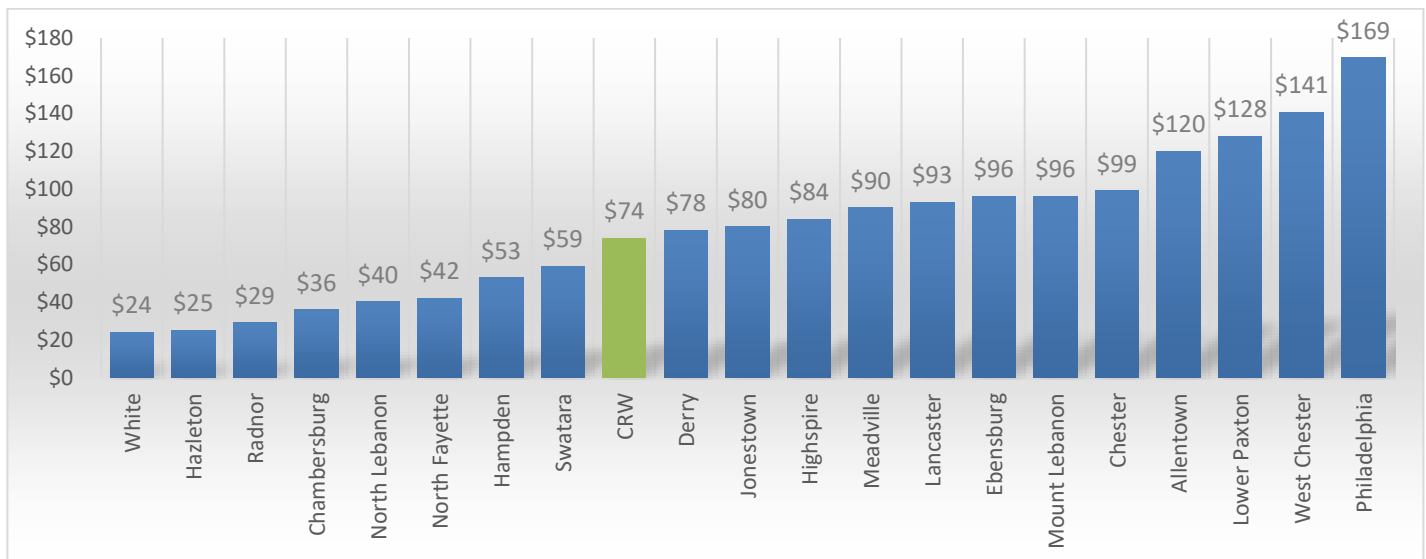
Figure 4-2. Estimated Monthly Residential Wastewater Bill Comparison



4.3. Stormwater Bill Comparison

In the Stormwater Implementation Plan Report that Raftelis prepared for CRW, dated May 14, 2019, Raftelis calculated a stormwater fee of \$73.76 per 1,023 square feet (“SF”) per year. Currently, CRW is planning to implement this fee on July 1, 2020. As the fee will only be in effect for one-half of the year, only one-half (\$36.38) of the fee will be assessed in FY 2020. This fee was compared to the annual stormwater fees currently (as of May 2019) assessed by a sample of 20 other municipalities in Pennsylvania. This comparison is shown in Figure 4-3. As shown in the figure, the projected fee was generally comparable to the stormwater fees currently assessed by other utilities in the region. For example, the projected fee per 1,023 SF was less than 12 out of the 20 utilities included in the survey.

Figure 4-3. Survey of Annual Residential Stormwater Fees in PA



5. Conclusions and Recommendations

5.1. Water System

1. A water rate revenue increase of 2.0 percent is recommended in FY 2020. This increase was applied proportionally to all rate components to calculate the proposed FY 2020 rates.
2. Under the proposed FY 2020 water rates, the Ready to Serve Charge for a customer with a 5/8” meter would increase from \$7.62 to \$7.77 per month, while the volume charge would increase from \$9.65 per 1,000 gallons to \$9.84 per 1,000 gallons at the beginning of fiscal year FY 2020. 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 2020 would raise the typical residential bill by \$0.86 per month, from \$43.81 to \$44.67 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 FY 2021 through FY 2023 are anticipated to cover projected costs and to meet fiscal requirements and targets in these years. No water rate increase is anticipated for FY 2024.
4. Based on the results of the rate comparison, CRW’s proposed FY 2020 water rates are comparable to the other communities included in the comparison. For example, the monthly residential water bill based on proposed FY 2020 rates for a customer using 3,750 gallons per month was calculated to be \$44.67 per month and was less than seven of the 12 communities surveyed.

5.2. Wastewater System

1. A retail wastewater rate revenue increase of 4.5 percent is recommended in FY 2020 and will result in the same percentage increase for all retail wastewater customers.
2. CRW should consider adding a fixed charge to the City retail wastewater rate structure to recover a portion of the capital costs of the system on a fixed revenue basis. Some wastewater utilities recover a portion of the cost of treating inflow and infiltration from a fixed charge and a portion from a volume rate to reflect that the number of connections in the wastewater system reflects the size of the system and the greater potential for infiltration through poor joints and cracked pipes, and the inflow through roof and foundation drains. In addition, some wastewater utilities recover a portion of annual debt service with a fixed charge to better match fixed costs with a fixed revenue stream. However, since adding a fixed charge could raise the wastewater bill for customers with low consumption, CRW may want to consider adding a fixed charge, while considering enhancing its customer assistance program for low income customers.
3. The recommended retail wastewater increase in FY 2020 would raise the typical residential bill by about \$1.27 per month, from \$28.69 to \$29.96 assuming 3,750 gallons of discharged wastewater per month. A retail rate revenue increase of 4.5 percent is projected each year in FY 2021 through FY 2023 to cover projected costs and to meet fiscal requirements and targets in these years. An increase of 5.5 percent is projected in FY 2024.
4. If there was no stormwater fee in any year of the forecast period, it is estimated that the annual retail wastewater rate revenue increases would be approximately 13.0 percent per year from FY 2020 to FY

2024. These increases are between 7.5 and 8.5 percentage points higher than the retail rate increases recommended with the current implementation plan for the stormwater fee.

5. The wastewater cost of service evaluation results indicated that the unit cost of providing wastewater treatment and conveyance service to Suburban wholesale customers will increase from \$4.39 per 1,000 gallons in FY 2019 to \$4.47 per 1,000 gallons in FY 2020 (increase of 1.8 percent), and the unit cost of providing treatment service to Steelton will increase from \$3.08 per 1,000 gallons to \$3.28 per 1,000 gallons (increase of 6.6 percent).
6. A wastewater collection rate of \$4.23 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 = \$1.77 + Capital = \$2.46 per 1,000 gal.).
7. While no true-up provision is included in the IMA between CRW and the Suburban communities, a true-up calculation applicable to the FY 2019 wholesale rates is expected to be completed during FY 2020 with actual costs and billing data from FY 2019. If the true-up determines that CRW has received an overpayment from wholesale customers in FY 2019, this amount is anticipated to be transferred by CRW to each suburban customer in FY 2020. Such a true-up payment would lower the ending cash balances projected over the forecast period for the wastewater system.
8. 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 2019 retail rates for customers discharging 3,750 gallons per month was calculated to be \$29.96, which is less than seven of the 12 utilities surveyed.
9. It is recommended that CRW consolidate its utilization rate and its maintenance rate into a single wastewater volumetric rate. While authorization language for assessing two separate volumetric rates is included in the City of Harrisburg's municipal code, no requirement to do so is included in the Wastewater Trust Indenture and CRW's accounting system is not setup to track these revenues separately. In addition, consolidating the two rates would not impact customer bills and would still generate the same amount of annual revenue, while reducing administrative burden.

5.3. Other Recommendations

If CRW wishes to reduce affordability concerns, it could consider developing and implementing a customer assistance program to assist low income customers afford water and wastewater service. This program might include multiple aspects, including a bill discount, payment plans, rebates for fixture replacements, complimentary leak checking and repair, implementation of a lifeline rate and tiered fixed charge.