



**City of Basehor**  
**County of Leavenworth, State of Kansas**  
**Wastewater Fund – Cost of Service Rate Study**

August 18, 2022



Baker Tilly Municipal Advisors, LLC  
8365 Keystone Crossing, Ste 300  
Indianapolis, IN 46240  
United States of America

T: +1 (317) 465 1500  
F: +1 (317) 465 1550  
[bakertilly.com](http://bakertilly.com)

August 18, 2022

City of Basehor  
2620 N 155<sup>th</sup> Street  
Basehor, KS 66007

**Subject: City of Basehor (Kansas) Wastewater Fund – Cost of Service Rate Study**

Dear City of Basehor:

It is our pleasure to provide you this analysis of your wastewater fund and the review of the rate structure. A cost of service study is not a historical document, it is a working document, which should be used as a reference for budget and finance decision-making. To this end, Baker Tilly is available to discuss the study at any point in the future.

Rates and charges should reflect the customer base being served. As such, the cost of service study found in these pages is unique to your community. The ultimate goal of every cost of service study is to develop a rate structure and revenue support system that meets the needs of operations, maintenance, and capital improvements and at the same time is as economical and equitable to the customers as possible, this is referred to as a “cost of service” analysis. You will find the observations and recommendations meet your needs and reflect your customer base.

By acceptance of this study the City Council understands and accepts the responsibility and liability for potential challenges to the rate structure and management of the funds. Cost of service studies, while often based on various methods, industry guidelines, do not follow a clear standard as does, for example, a CPA in producing an audit according to Generally Accepted Accounting Principles. Furthermore, state law and case law do not provide any reasonable or comprehensive guidance regarding methodology, rate structure or management of fund balances. Baker Tilly is reliant upon City officials, and other sources, who have access to relevant data to provide accurate information. The City accepts that fund management and rate adjustment recommendations are inherently subject to estimations and, as such, no assurance is provided regarding the actual performance of the funds over time.

As always, it was a pleasure serving you and do not hesitate to call if you wish to further discuss our findings.

Sincerely,

**BAKER TILLY MUNICIPAL ADVISORS, LLC**

Douglas L. Baldessari, CPA, Partner

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# **Executive Summary**

## **1.1 Community Background**

The City of Basehor, Kansas (the “City”) owns and operates a sewage collection system, pumping stations, and wastewater treatment facility. The City serves roughly 2,800 customers in the City of Basehor and surrounding areas.

The City’s sanitary sewer system is made up of approximately 230,895 linear feet of gravity sewer lines and 61,930 linear feet of force mains. Additionally the City currently operates sixteen lift stations, with more currently planned. The lift stations equally cover both the Wolf Creek and Hog Creek watersheds. The City also owns a wastewater treatment plant with 2.2 million gallons per day of capacity.

## **1.2 Objectives**

To identify the revenue support and fund management needed to fulfill the City’s sewage works operations and maintenance and capital improvements to the system while maintaining adequate cash reserves to be able to respond to unforeseen circumstances.

### **1.3 Proposed Rates**

Based on our analysis and direction from City officials, Baker Tilly is recommending restructuring the sewer rates and charges. Currently residential customers inside the City are billed a monthly flow charge of \$13.58 per 1,000 gallons. The flow charge is multiplied by the customers average consumption from the preceding December, January and February months. Non-annexed customers are billed at a rate of \$16.99 per 1,000 gallons. Commercial customers are billed in a similar fashion, but their average is taken time a lower rate per 1,000 gallons equal to \$9.35. Baker Tilly is recommending the monthly billings and proposed rate structure be based on a base and flow charge methodology. Each customer, regardless of class, would be billed a fix monthly fee based on the size of their water meter. In addition to the base charge, both residential and commercial classes would be billed a flow charge based on their average consumption from the preceding months of December, January and February. The flow charge per 1,000 gallons for all classes would be the consistent.

### **1.4 Cash Position Summary**

The cash and investments balance for the Sewage Works is currently \$3,416,206 which is around 32 months of cash operating expenses. This is a healthy cash balance as the balance maintained is required to be the greater of \$1,000,000 or 30% of the following year's budgeted expenses (\$330,000).

## Information and Assumptions

The City and McAfee Henderson Solutions (“MHS”) have developed a Sanitary Sewer Master Plan. The master plan includes various expansion projects the City intends to pursue in the coming years. The significant projects included are Wolf Creek lift stations and the Hog Creek Interceptors. The cost of service study covers a 20-year planning period to take these expansion projects into account. The cost of service study is a multi-step process: 1) calculating pro forma annual cash operating expenses, 2) integrating the capital projects as shown in the master plan, 3) developing annual revenue requirements, 4) calculating meter equivalents, 5) allocating the pro forma cash operation and maintenance expenses to the different functional departments, and 6) calculating the pro forma rates and charges.

### Key information

- Calendar Year 2021 Financial Statements.
- Calendar Year 2022 Adopted Budget.
- 2020 Sanitary Sewer Master Plan.
- 2021 Wolf Creek Sanitary Master Plan.
- Consolidated Rural Water and Suburban Water Usage Reports.

### Key Assumptions

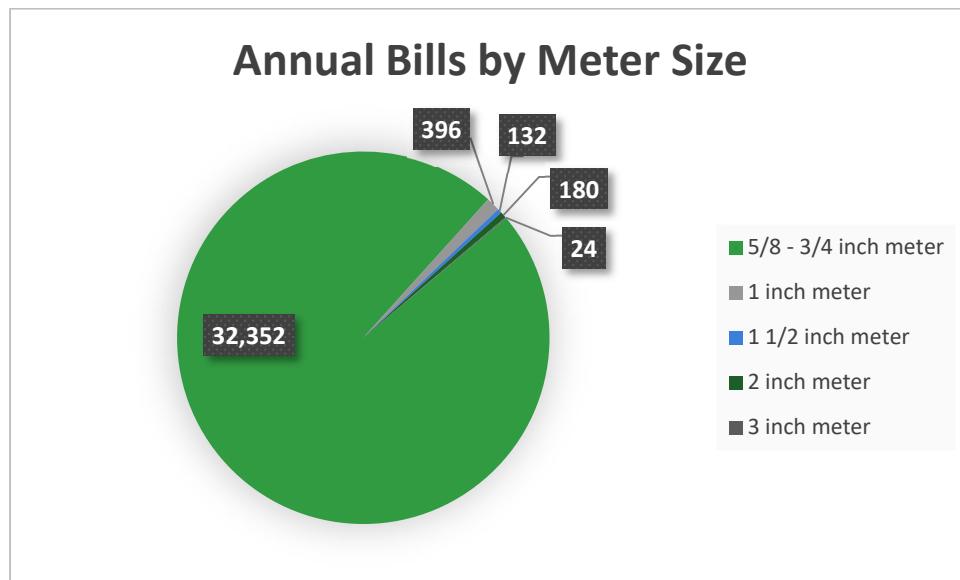
- Rates should not only cover the system costs, but also support future system maintenance, capital improvements, and debt service payments.
- The City is anticipating fifty new customers annually.
- Expansion projects will be funded through a combination of connection fees, bonds and cash on hand.
- The proposed bonds in Calendar Year 2023 are assumed to have a 20 year term at 4.5% interest rate, the proposed bonds in Calendar Year 2036 are assumed to have a 20 year term at 5.0%
- Expansion projects will follow the estimated timeline, per utility management.

## Revenues

### 2.1 Customers and Collections

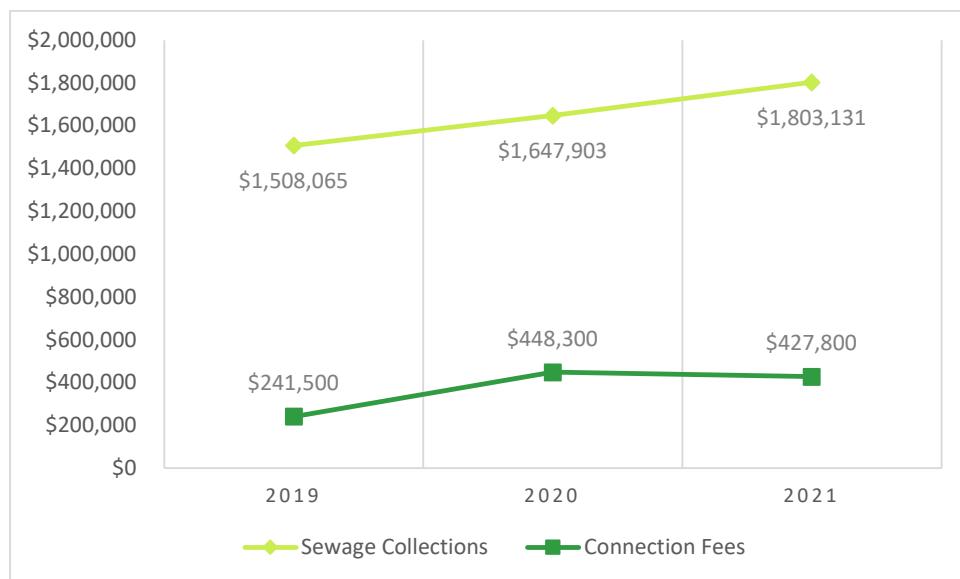
The City serves customers within its own City limits as well as a small amount of non-annexed customers. The table below shows the breakout of annual bills by meter size.

TABLE 2-1: CUSTOMER COUNTS BY LOCATION AND METER SIZE



Over the past three years the City has seen a healthy increase in sewage collections and connection fees. The table below shows the growth of sewage collections and connections fees from 2019 to 2021.

TABLE 2-2: GROWTH OF COLLECTIONS & CONNECTION FEES



## 2.2 Current Rates

The City currently bills customers based on a flow charge per 1,000 gallons of water consumed. The amount of water consumed is based on the average water consumption for the month of December and the months of January and February in the next year. Additionally, the monthly minimum charge is 150% of the established flow rate. Currently, the City bills three different classes of customers; Residential, Residential (Non-annexed) and Commercial. The table below shows the current schedule of rates and charges.

TABLE 2-3: PRESENT RATES AND CHARGES

	Present (1)	Adopted 2022 (2)	Adopted 2023 (2)	Adopted 2024 (2)	Adopted 2025 (2)
<b>I. METERED USERS:</b>					
<b>Flow Charge (Per 1,000 gallons)</b>					
Residential	\$13.58	\$13.92	\$14.27	\$14.63	\$15.00
Residential (Non-Annexed)	16.99	17.41	17.85	18.30	18.76
Minimum bill - Residential	20.37	20.88	21.40	21.94	22.49
Minimum bill - Residential (Non-Annexed)	25.49	26.13	26.78	27.45	28.14
Commercial	9.35	9.58	9.82	10.07	10.32
<b>Connection Fees</b>					
Inside City	\$3,450	\$3,450	\$3,450	\$3,450	\$3,450
Outside City	5,175	5,175	5,175	5,175	5,175

(1) The present rates and charges were adopted on May 20, 2013 per Ordinance No. 626.

(2) Includes the annual 2.5% increase.

The current rates include an annual increase of 2.5% over the previous rates and charges. Table 2-3 above shows where the rates would end up after the next two 2.5% increases.

## 2.3 Proposed Rates

Table 2-4 displays the proposed rates over the next three years. These rates would include a base charge to all customers based on the size of their water meter and a flow charge per 1,000 gallons.

TABLE 2-4: PROPOSED RATES AND CHARGES (1)

		Cost of Service - Phase I (2023)	Cost of Service - Phase II (2024)	Cost of Service - Phase III (2025)
<b>I. METERED USERS:</b>				
<b>Annexed Customers</b>				
<b>Monthly Base Charge</b>				
5/8- 3/4	inch meter	\$8.65	\$8.65	\$8.90
1	inch meter	21.00	21.00	21.55
1 1/2	inch meter	48.15	48.15	49.40
2	inch meter	82.70	82.70	84.80
3	inch meter	189.70	189.70	194.45
<b>Flow Charge (Per 1,000 gallons)</b>				
All retail users		\$11.75	\$12.15	\$12.50
<b>Non-Annexed Customers</b>				
<b>Monthly Base Charge</b>				
5/8- 3/4	inch meter	\$10.85	\$10.85	\$11.15
1	inch meter	26.25	26.25	26.95
1 1/2	inch meter	60.20	60.20	61.75
2	inch meter	103.40	103.40	106.00
3	inch meter	237.15	237.15	243.10
<b>Flow Charge (Per 1,000 gallons)</b>				
All retail users		\$14.70	\$15.20	\$15.65

(1) Assumes rates per 'Calculation of Pro Forma Rates and Charges', as shown on page 22 of the detailed cost of service study dated August 18, 2022.

## 2.4 Sewer Billing

The City currently oversees billing within the utility department. Through this analysis the City is exploring a different method of billing customers. As a part of this proposal the City will potentially change from sending monthly bills from the utility billing department to including customer's bills on the property tax bills. Billing on the property tax bills is subject to acceptance by Leavenworth County. If accepted, there are several advantages shown below for billing through the property tax bills:

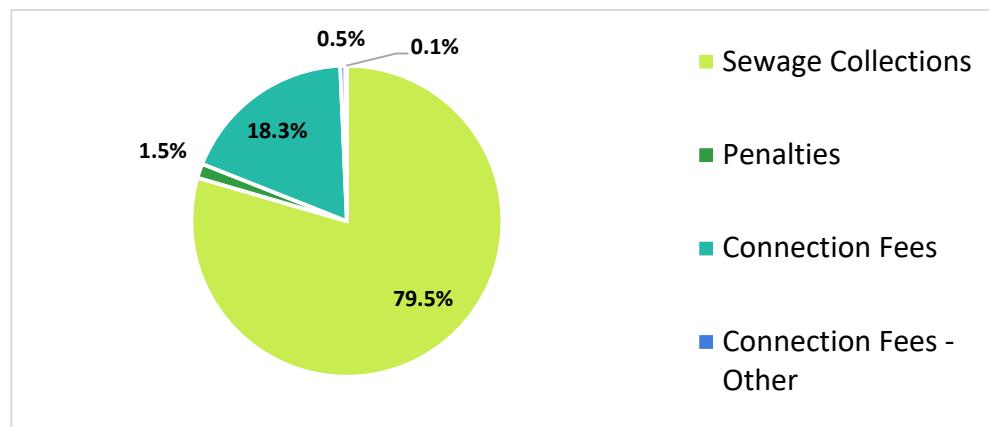
- This could result in staff cost savings depending on if the City wishes to proceed subject to the acceptance of Leavenworth County of this process.
- Decrease the penalties billed to customers and significantly reduce the collection efforts from sending the sewer bills monthly.

- Decrease payment delinquencies and collection efforts as the City has a 99.66% collection rates for property taxes billed.
- Increase the City's ability to collect utility bills from renters. Since the bills will be included on the property tax bills, the owner of the rental unit will be directly responsible for the payment of the sewer bill. The rental owner could then pass through the utility bill on the monthly rent statement. This billing method allows the City to avoid having to directly bill renters and avoids instances where renters leave and do not pay their last sewer bill.

## 2.5 Revenue

The City primarily derives its revenues from sewage collections and connection fees. A small portion of total revenues come from penalties and interest income. The chart below demonstrates how much revenue is derived from each revenue type.

TABLE 2-5: REVENUE BY CATEGORY



The majority of the City's user revenue is brought in by the City's flow charge. This partially aligns with industry standard as a flow charge based on usage is typically seen as an equitable way to allocate costs to customers. Industry standards and authoritative guidance from the Water Environment Federation (WEF) provide for fixed charges to also be included to equitably recover costs from rate payers. It is not ideal to have all of revenues dependent on usage because that will subject the utilities' revenues too much to fluctuations in usage patterns. By including a base charge this helps utilities recover these fixed costs, even in years where customer usage may drop.

In addition to the revenues brought in by user rates, the City is conservatively assuming consistent levels of other revenue (revenue not derived from user rates). These revenues consist primarily of penalties and interest income. The cash flow estimation assumes that penalties will remain at calendar year 2021 levels while interest income will be assumed at annual interest rate of 0.25%, which is roughly double the historical investment level.

# Operating & Maintenance Expenses

## 3.1 Historical Operation and Maintenance Expenses

Historical operation and maintenance expenses are analyzed in the report to help look for trends and to help identify any outlier expenses. The Sewage Works operating expenses are primarily made up of salaries and wages, utilities, and repairs and maintenance. The current year budget is consistent with previous years but includes an additional \$200,000 annually for a transfer to employee benefits. In addition, the pro forma disbursements include a 5% aggregate annual inflationary factor for three years. Table 3-2 below shows the pro forma disbursements by category.

Table 3-1: Pro Forma and Disbursement History

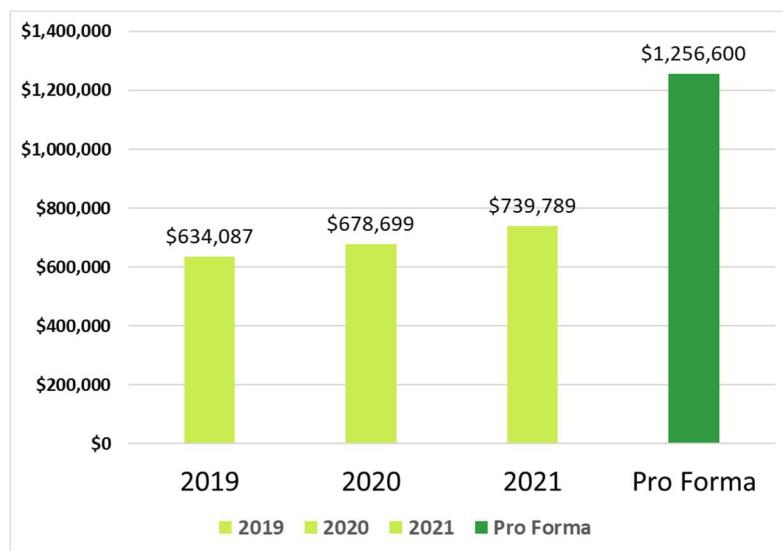
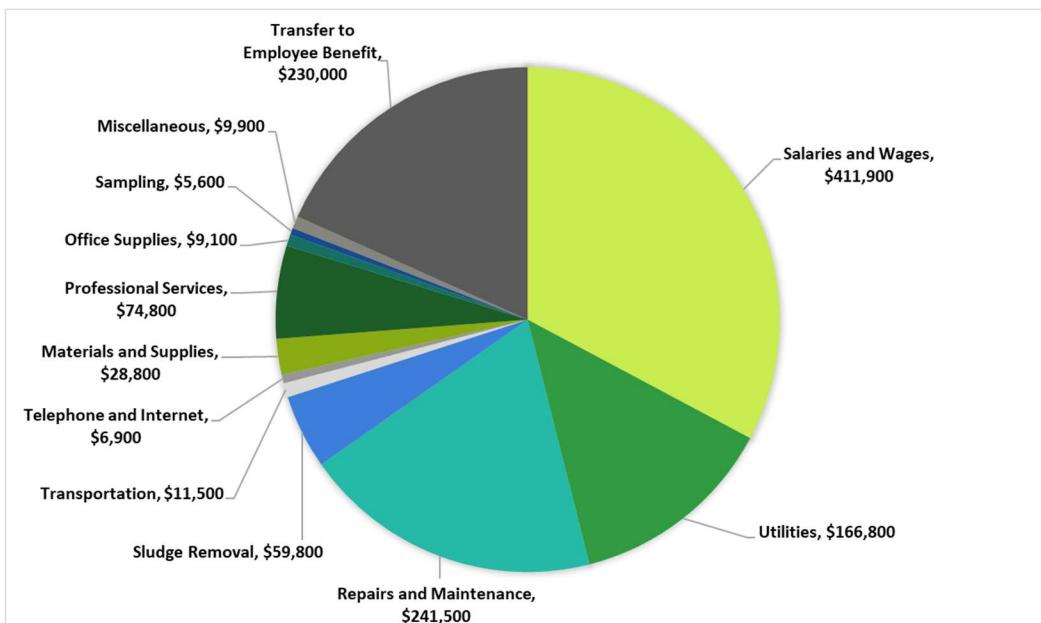


Table 3-2: Pro Forma Disbursements by Category



## **3.2 Test Year**

A test year is a normalized twelve-month period for operating and maintenance expenses and becomes the base year used for estimating future expenses. The test year for the cost-of-service study was calendar year 2021.

Prior year financials are analyzed for trends, outliers, or one-time expenses. Any items of concern were discussed with City officials to determine what a particular line-item expense should be in a normal year. Certain adjustments were made to these line items to reflect a normalized year's expense more accurately to be used in the test year before estimating out into future years.

## **3.3 Inflation Assumptions**

The next step is to increase the test year expenses by an annual inflationary factor. This is done as it is not reasonable to expect expenses to be the same as they are today over the 20 years estimated in the report. These annual inflationary increases reflect the increases in costs over time and are used to help estimate what future operating and maintenance expenses will be for the analysis. As we are currently experiencing a historically high inflationary period, the expense categories for 2022 through 2024 have been increased by 5% aggregate amount per year. Assuming inflation will fall back to normal levels in the future we have used an annual 3% inflationary factor from 2025 through 2041.

# Capital Improvement Plan

## 4.1 Capital Improvement Plan (CIP)

Capital improvements are larger, one-time expenses that are not included in annual operating and maintenance expenses. It is beneficial to look at potential capital improvements well in advance and develop a capital improvement plan as it will help the City develop policy to manage rates over time in order to maintain the sewer system with an efficient use of funds. For the upcoming years, the City's capital improvement plan includes projects for an additional lift station, Wolf Creek lift stations, and Hog Creek North/South Interceptors.

The below capital improvement plan includes the expansion projects in addition to the typical annual capital outlays. The estimated costs were provided by the City and MHS.

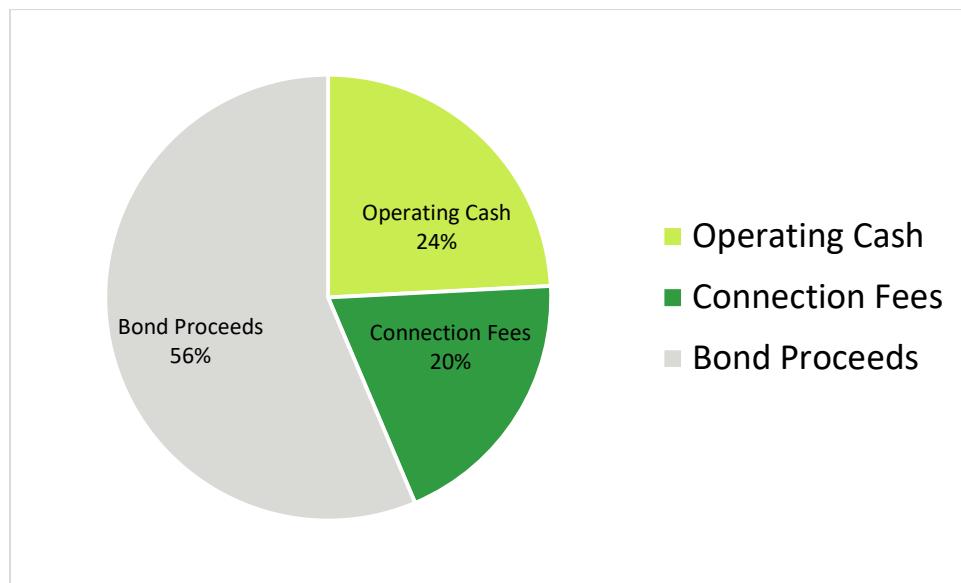
TABLE 4-1: CAPITAL IMPROVEMENT PLAN

<b>Expansion Projects:</b>		<b>Estimated Cost</b>	<b>Funding Source</b>
<b>Estimated Timeline of 3 Years:</b>			
2302 N. 158 Lift Station	\$1,623,000		Bond Issue
Wolf Creek Interim Lift Station #3	302,900		Bond Issue
Wolf Creek Interim Lift Station #2	859,000		Bond Issue
Subtotal		\$2,784,900	
<b>Estimated Timeline of 5-10 Years:</b>			
Wolf Creek Permanent Lift Station #1	693,200		Cash Funded
Wolf Creek Interim Lift Station #4	226,900		Cash Funded
Subtotal		920,100	
<b>Estimated Timeline of 15-20 Years:</b>			
Hog Creek South Interceptor Phase I	3,836,000		Bond Issue
Hog Creek South Interceptor Phase II	1,986,666		Bond Issue
Hog Creek North Interceptor	2,891,500		Bond Issue
Subtotal		8,714,166	
<b>Total Expansion Projects</b>		<b>\$12,419,166</b>	

## 4.2 Capital Improvement Plan Funding

The City plans to finance the capital project through a combination of connection fees, cash on hand and the proposed bond issues. In order to fund the expansion projects a proposed \$3,000,000 bond will need to be issued in 2023 and a proposed \$4,000,000 bond will need to be issued in 2036. The table below shows the capital improvement funding summary.

TABLE 4-2: CAPITAL IMPROVEMENT PROJECTS FUNDING SUMMARY



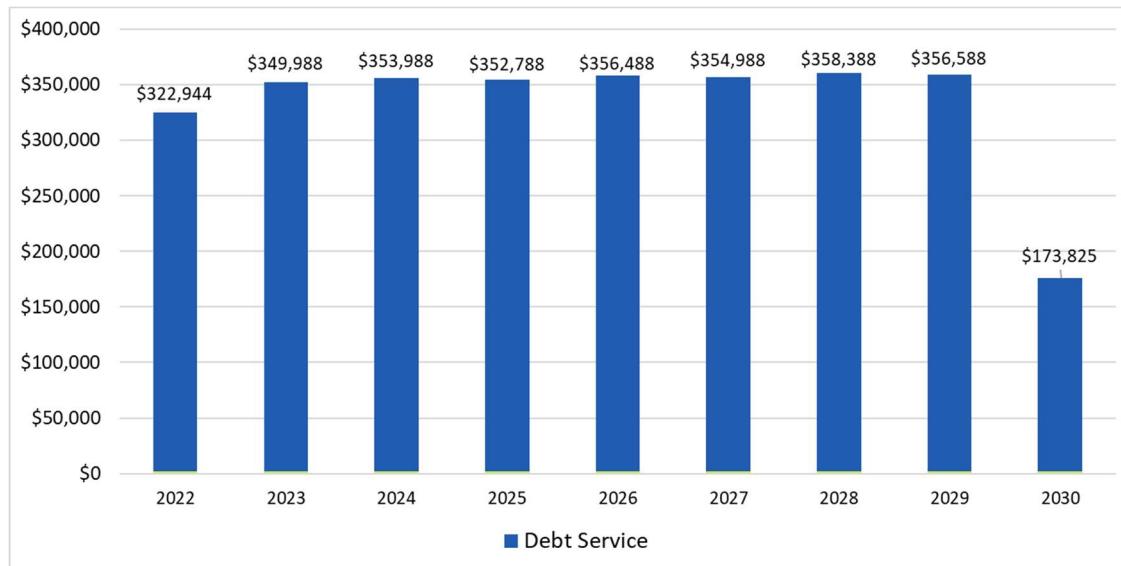
We are proposing that the 2302 N. 158 Lift Station, Wolf Creek Interim Lift Station #3 and #2 be grouped into one bond issue, and all Hog Creek projects be grouped into one bond issue. Grouping projects together and utilizing debt only when needed helps make more efficient use of the City's funds as this helps reduce the amount of bond issuance costs that would be incurred if the City were to issue multiple smaller bond issues. Further detail on the methodology for determining the need to issue bonds is explained in section 6.1.

# Debt Service

## 5.1 Current Debt Service

The City currently has one bond issue that the sewer fund is contributing to at an annual amount of approximately \$355,000. The current outstanding long-term debt is set to mature September 1, 2030, as shown below.

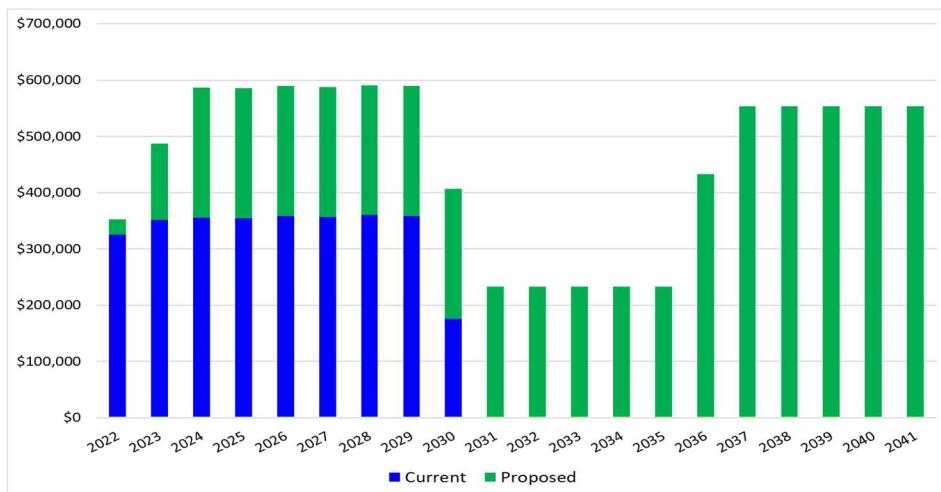
TABLE 5-1: EXISTING DEBT SERVICE SCHEDULE



## 5.2 Proposed Debt Service

In order to fund the expansion projects two bonds are being proposed. First, in 2023 a \$3,000,000 bond amortized over 20 years at an assumed interest rate of 4.5%. In 2036, a \$4,000,000 bond amortized over 20 years at an assumed interest rate of 5.0%. The table below shows the estimated annual debt service on all outstanding and proposed bonds.

TABLE 5-2: EXISTING AND PROPOSED DEBT SERVICE SCHEDULE



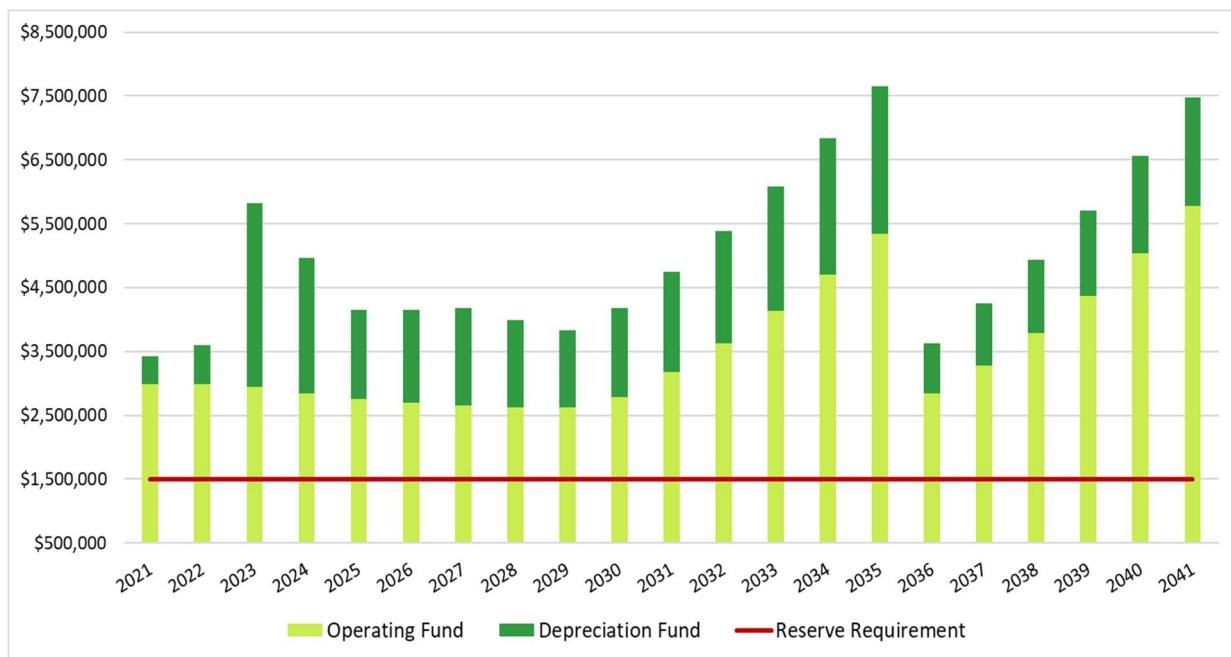
# Cash Flow

## 6.1 Methodology

The revenue needs to support operations, debt, and capital improvements while maintaining a cash balance above the minimum reserve requirement. The City intends to use cash built up from connection fees and long-term debt to minimize the rate impact for customers. City officials determined that small ratable increases in rates was best for their customer base. With this goal in mind, the City will need to issue two bond issues in order to complete the desired capital improvement plan.

From 2021 through 2041 the cash balances gradually increase as the City increases rates, gains new connections, and issues bonds, only dipping slightly in years with large expansion projects that will be partially cash funded. The cash flow estimation shows the cash balances to be above the required reserve amount in each of the respective years.

TABLE 6-1: SCHEDULE OF ACTUAL AND ESTIMATED ENDING CASH BALANCE



## 6.2 Proposed Rates

The cash flows reflect an overall increase of 4% in 2023, 3% in 2024, and followed by 2.5% per year through 2041. The table on the following page demonstrates the proposed rates. The annual rate increases are higher in the early years to pay for the additional debt service and costs related to the proposed capital improvement projects which is not uncommon. The City has done a good job adjusting rate and charges annually to keep up with inflationary operating increases. The additional adjustments of 1.5% in 2023 and 0.5% in year 2024 over the already approved 2.5% annually are needed to keep up with higher than expected inflation and pay for the large proposed capital projects.

TABLE 6-2: PROPOSED RATE ADJUSTMENTS

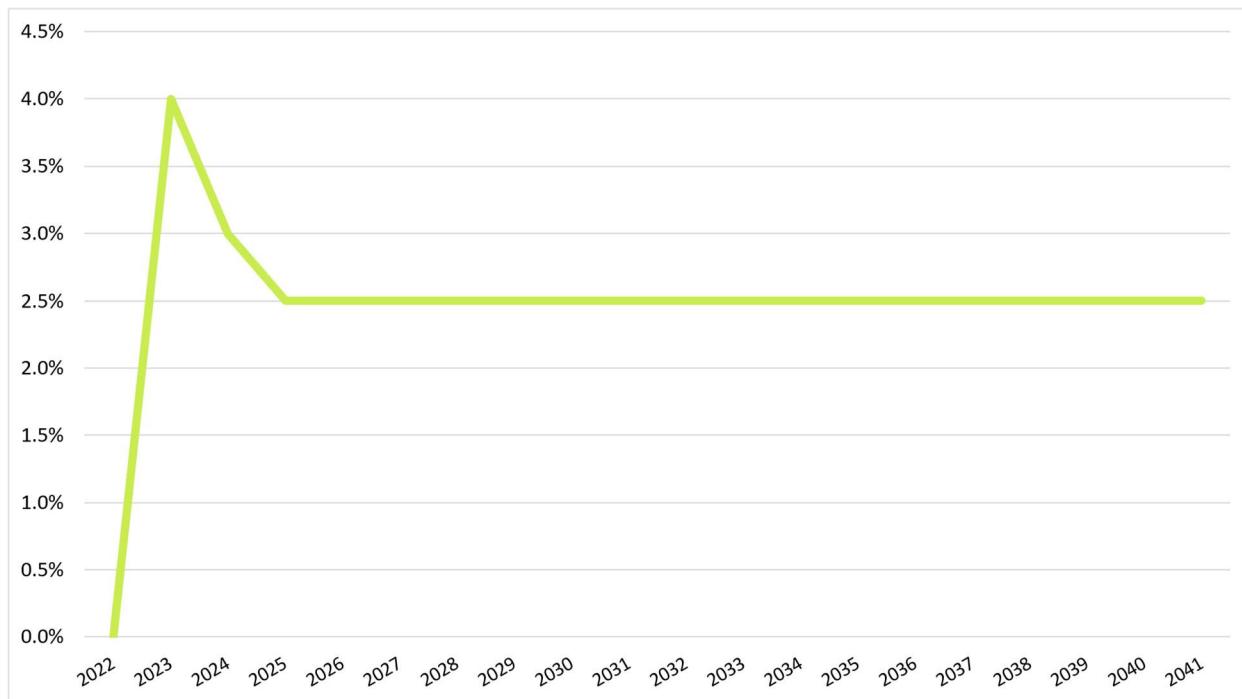


TABLE 6-3: COMPARISON OF MONTHLY RESIDENTIAL BILLS (4,000 GALLONS PER MONTH)

Year:	Adopted Rates	Proposed Cost of Service	Proposed Cost of Service Increase (%)	Proposed Cost of Service Increase (\$)	Proposed Cost of Service vs. Adopted Rates (\$)
Current	\$54.32				
2022	\$55.68				
2023	\$57.08	\$55.65	2.4%	\$1.33	(\$1.43)
2024	\$58.52	\$57.25	2.9%	\$1.60	(\$1.27)
2025	\$60.00	\$58.90	2.9%	\$1.65	(\$1.10)

## 6.3 Rate Impact Summary

The proposed rates result in various degrees of increases depending on meter size and customer classification, as shown below for a typical 4,000 gallons per month bill.

TABLE 6-4: COMPARISON OF MONTHLY BILLS – PHASE I

Meter Size	Gallons	Present Rates		Cost of Service - Phase I	
		(1)	Rates	Variance	%
<b>Residential Class:</b>					
<b>3/4 - 5/8"</b>	0	\$21.40	\$8.65	(\$12.75)	-60%
	1,000	21.40	20.40	(1.00)	-5%
	2,000	28.54	32.15	3.61	13%
	3,000	42.81	43.90	1.09	3%
	4,000	57.08	55.65	(1.43)	-3%
	5,000	71.35	67.40	(3.95)	-6%
	10,000	142.70	126.15	(16.55)	-12%
	15,000	214.05	184.90	(29.15)	-14%
	20,000	285.40	243.65	(41.75)	-15%
<b>1"</b>					
	5,000	71.35	79.75	8.40	12%
	10,000	142.70	138.50	(4.20)	-3%
	15,000	214.05	197.25	(16.80)	-8%
	20,000	285.40	256.00	(29.40)	-10%
	40,000	570.80	491.00	(79.80)	-14%
	60,000	856.20	726.00	(130.20)	-15%
	100,000	1,427.00	1,196.00	(231.00)	-16%
<b>Commercial Class:</b>					
<b>3/4 - 5/8"</b>	0	\$0.00	\$8.65	\$8.65	
	1,000	9.82	20.40	10.58	108%
	2,000	19.64	32.15	12.51	64%
	3,000	29.46	43.90	14.44	49%
	4,000	39.28	55.65	16.37	42%
	5,000	49.10	67.40	18.30	37%
	10,000	98.20	126.15	27.95	28%
	15,000	147.30	184.90	37.60	26%
	20,000	196.40	243.65	47.25	24%
<b>1"</b>					
	5,000	49.10	79.75	30.65	62%
	10,000	98.20	138.50	40.30	41%
	15,000	147.30	197.25	49.95	34%
	20,000	196.40	256.00	59.60	30%
	40,000	392.80	491.00	98.20	25%
	60,000	589.20	726.00	136.80	23%
	100,000	982.00	1,196.00	214.00	22%
<b>1 1/2"</b>					
	20,000	196.40	283.15	86.75	44%
	50,000	491.00	635.65	144.65	29%
	100,000	982.00	1,223.15	241.15	25%
	250,000	2,455.00	2,985.65	530.65	22%
<b>2"</b>					
	50,000	491.00	670.20	179.20	36%
	100,000	982.00	1,257.70	275.70	28%
	250,000	2,455.00	3,020.20	565.20	23%
	500,000	4,910.00	5,957.70	1,047.70	21%
<b>3"</b>					
	100,000	982.00	1,364.70	382.70	39%
	250,000	2,455.00	3,127.20	672.20	27%
	500,000	4,910.00	6,064.70	1,154.70	24%
	1,000,000	9,820.00	11,939.70	2,119.70	22%

(1) Includes the annual 2.5% increase.

TABLE 6-5: COMPARISON OF MONTHLY BILLS – PHASE II

Meter Size	Gallons	Present Rates		Cost of Service - Phase II		%
		(1)	Rates	Rates	Variance	
<b><u>Residential Class:</u></b>						
3/4 - 5/8"	0	\$21.94	\$8.65	(\$13.29)		-61%
	1,000	21.94	20.80	(1.14)		-5%
	2,000	29.26	32.95	3.69		13%
	3,000	43.89	45.10	1.21		3%
	4,000	58.52	57.25	(1.27)		-2%
	5,000	73.15	69.40	(3.75)		-5%
	10,000	146.30	130.15	(16.15)		-11%
	15,000	219.45	190.90	(28.55)		-13%
	20,000	292.60	251.65	(40.95)		-14%
1"						
	5,000	73.15	81.75	8.60		12%
	10,000	146.30	142.50	(3.80)		-3%
	15,000	219.45	203.25	(16.20)		-7%
	20,000	292.60	264.00	(28.60)		-10%
	40,000	585.20	507.00	(78.20)		-13%
	60,000	877.80	750.00	(127.80)		-15%
	100,000	1,463.00	1,236.00	(227.00)		-16%
<b><u>Commercial Class:</u></b>						
3/4 - 5/8"	0	\$0.00	\$8.65	\$8.65		
	1,000	10.07	20.80	10.73		107%
	2,000	20.14	32.95	12.81		64%
	3,000	30.21	45.10	14.89		49%
	4,000	40.28	57.25	16.97		42%
	5,000	50.35	69.40	19.05		38%
	10,000	100.70	130.15	29.45		29%
	15,000	151.05	190.90	39.85		26%
	20,000	201.40	251.65	50.25		25%
1"						
	5,000	50.35	81.75	31.40		62%
	10,000	100.70	142.50	41.80		42%
	15,000	151.05	203.25	52.20		35%
	20,000	201.40	264.00	62.60		31%
	40,000	402.80	507.00	104.20		26%
	60,000	604.20	750.00	145.80		24%
	100,000	1,007.00	1,236.00	229.00		23%
1 1/2"						
	20,000	201.40	291.15	89.75		45%
	50,000	503.50	655.65	152.15		30%
	100,000	1,007.00	1,263.15	256.15		25%
	250,000	2,517.50	3,085.65	568.15		23%
2"						
	50,000	503.50	690.20	186.70		37%
	100,000	1,007.00	1,297.70	290.70		29%
	250,000	2,517.50	3,120.20	602.70		24%
	500,000	5,035.00	6,157.70	1,122.70		22%
3"						
	100,000	1,007.00	1,404.70	397.70		39%
	250,000	2,517.50	3,227.20	709.70		28%
	500,000	5,035.00	6,264.70	1,229.70		24%
	1,000,000	10,070.00	12,339.70	2,269.70		23%

(1) Includes the annual 2.5% increase.

## **6.4 Report Summary**

Through this cost of service study, the City's sewage works will be able to continue to support the operational costs of the utility, fund on-going capital improvements and provide a road map for funding future expansion projects. In addition to meeting these stated objectives, the utility will be able to accomplish these goals while maintaining strong cash balances and minimizing rate impact on customers with just minor increases over the already adopted 2.5% annual adjustments as detailed in Section 6.2. The study also provides a method for the City to potentially bill customers on the property tax bills which could help reduce delinquencies and allow the sewage works to save annually on operation costs. Finally, the revised costs of service rate structure will more equitably recover the costs from the sewage works current and future customers.

This report allows the City to accomplish the stated goals based on today's assumption, but the report should also be viewed as a living document and be updated and re-evaluated as the needs of the City change over time. Through proper planning and analysis, the City can continue to accomplish the goals set out for the sewage works while also keeping rates and charges fair and equitable for its customer base.