March 16, 2023

Mr. Justin Kneisel, Chairman
Butler County, Kansas, Rural Water District # 5
P.O. Box 56
Benton, KS 67017

Subject: Water Rate Analysis Report

Dear Mr. Kneisel:

Attached is the District's rate analysis report. Before I address the report, I want to speak to everyone who will read this.

Terry Brown, no relation, was my contact for this project. He was fantastic to work with. Terry was always so helpful, and he is the sharpest district manager I have come across for a long time. Terry has strong command of the District's situation and systems. Plus, I really enjoyed working with him. I hope folks in the District recognize they are well-served by Mr. Brown. Now, on to the report.

The report and rates model enclosed cover a lot of technical ground. Board members may have questions after reviewing the report, so filter questions to me through Terry and I will answer all. And when I meet with the Board, likely remotely by Zoom, I look forward to discussing anything that is too complicated to cover in e-mails.

Finally, I am sure you and Board members know of other Districts and utilities that also need rate setting help. As you run into these folks at rural water association and other meetings and venues, or even in the grocery store, I hope you will tell them about my services. I get much of my business by referral from past clients and I hope to be able to trace several future clients back to my work with your District, as well.

Best regards,
GettingGreatRates.com

Carl E. Brown
President

Enclosure

Water Rate Analysis Report

Butler County Rural Water District #5

Benton, Kansas

Prepared March 16, 2023

Carl Brown, President
GettingGreatRates.com, LLC

Contents

Index of Model Tables and Charts

Executive Summary

This analysis calculates water rates for the Butler County, Kansas, Rural Water District #5 that are, in most respects, in a cost-to-serve structure. The modeling includes rates recommended to fund what appears to be the most likely set of conditions. This model shows the effect improvements will have on rates. Other scenarios were run but because they affect rates so little, or are unlikely to materialize, those models were discarded.

The Governing Body's Job is Broad and Critical

This report covers my findings. Based on those findings, I made rate and fee setting recommendations. However, and this is quite important, my job is only to advise. The governing body's job is to set rates, among many other things.

Utility management requires the governing body to consider rates-related issues:

- How would the recommended rate structure and overall level of the rates affect ratepayers and funding of system needs?
- How different is the recommended structure compared to the current rate structure, meaning, how much "rate shock" would the recommended rates create for some customers?
- How might the governing body adjust (reduce) system costs, delay capital improvements, obtain grant or other outside funding for such improvements and do many other things to reduce the need for additional revenue?
- And even if rate increases are not a problem, how might the utility be managed differently to reduce costs and be more efficient?

Those are just a few issues related to rate setting the governing body must consider. The job of the governing body is a big one, covering much more than rate setting. The members of the governing body have intimate knowledge of "conditions on the ground," community needs and ratepayer feelings. I only got a glimpse of such things. As the governing body considers those, and many other things, it will decide how to set rates and fees. My analyses and recommendations should be very helpful as they do that, but my charge is only to advise, not direct.

All ratepayers and utility customers should be thankful that people from the community stepped forward and joined the governing body to do that critical work. Without such civic-minded people making utility service function well, quite literally, community-based living would not be possible. It is common for some citizens these days to not believe officials and even work against "government" at all levels. That is unfortunate because local government officials make it possible for the rest of us to live and work where we do.

To the governing body members, I say a heartfelt, "thank you." I feel privileged to advise you and I trust you to seek the best overall outcome for your citizens and utility customers.

The Meaning of This Report, in a Nutshell

The Butler County, Kansas, Rural Water District #5, later just called "RWD #5," "the District," or "you," hired GettingGreatRates.com, later called "me," or "I," to perform rate analysis of its water utility; to produce a report of my findings and recommendations; and to provide guidance on rate setting.

This report is detailed and somewhat long. The math behind the report is complex. Some assumptions had to be made about data and outcomes, which is normal. Still, these things make the modeling complex and interpreting the Model difficult. Following is the "Cliff's Notes" version of what the calculated rates will do and what they mean to customers.

The idea the initial rate calculations in this report are based on is called, "cost-of-service" or "cost-to-serve" rates. This is the prime industry standard for utility rate analysis. Quite simply, if a customer causes the utility to incur a cost, that customer should reimburse the utility for that cost. In your case, rate revenues need to go up only slightly and most of that is from a higher unit charge.

Introduction

RWD #5 is different from many rural water districts. It is on the outskirts of Wichita, a significant and growing metropolitan area. The current trend of suburban development is expected to continue, and that will increase water usage, increasing costs. This modeling and report cover the rates-related parts of this issue, and others.

As for me, your rate analyst, I have analyzed rates as a consultant since 2005, completing 351 analyses since then. Before that, from 1991 to 2005, I did similar work, as well as grant and loan coordination work, for the Missouri Department of Natural Resources. My experience is deep. I calculated your rates with due diligence using the best methodologies and reasoning I can. I trust my expertise and the results I get. You should, too. You can adopt the rates recommended in this report and all should turn out well for you.

But it is reasonable for you to be curious about my methodologies and why and how I employ them. "Trust but verify" is a reasonable attitude for you to have because rate setting is one of your most critical and criticized tasks. You need to get it right. Just summarizing my methodologies requires a lot of discussion, therefore, I left that discussion out of the main part of the report. I placed those discussions in Appendix A, starting on page 17.

If you have a basic working knowledge of rate setting, and if you will consider the logic of what follows, you should be able to read on and learn what you need to know to set rates appropriately and confidently. If, however, you read something that you do not understand and you want to understand it, go to Appendix A. I likely covered the issue there. If I did not and if the issue is important to you, just call and I will talk you through it.

Appendix A summarizes my rate analysis methodologies, theories, and general issues.

Now, to the specifics of your rates situation and my analysis and recommendations.

Currently RWD #5 assesses water user charge rates that can be summarized like this:

- Water meters are read, and bills assessed monthly. Bills include a minimum charge that rises with meter size, and unit charges that are level for all volume used.
- You assess a "Benefit Unit" and a "System Development" charge when a new connection is made to a lot or property that is being developed. Those fees also rise with meter size. You also assess the out-of-pocket costs the District incurs to make or enable each new connection, which I recommend you continue doing.
- RWD #5 purchases water from Wichita and El Dorado. I assumed you will continue that practice.

The rate analysis modeling covered 12 years, as follows:

- The "test year" is the one-year period from which data was used as the starting place for the analysis. We almost always use the last completed fiscal year as the test year. That is what we did in your case, too.
- The modeling was started and completed during the next year. In the model tables, this is called, "0 Year."
- For the next ten years, the modeling used budget figures, capital improvement cost estimates, etc. when available. Those normally cover one or two future years. For the remainder of the ten projection years, we increased incomes, costs, etc. by expected inflationary factors.

The current rate structures are normal and appropriate in your situation. I recommend only slight changes in structure and raising the overall rate revenues to adequately fund the system.

This report is the culmination of a process where I submitted information and data requests to the District's Manager, Terry Brown, my primary contact. He replied, rapidly and very accurately, I must say. We went through this step several times because rate analysis takes a large amount of data, and it is common to "home in" on the optimal set of conditions and rates as the analysis reveals them. As I received information and data, I modeled the utility's finances and rates and submitted drafts for review and feedback. Mr. Brown reviewed those drafts to assure accuracy, and when needed, he corrected data.

I prepared and submitted a draft final report. Again, Mr. Brown reviewed and gave me feedback. I revised the report accordingly to be this, the final report.

The report is in two parts. The first part is this narrative report that tells readers what should be done to the utility's rates and why and interprets much of the mathematical modeling. The second is a printout of the modeling. The model is named and described as follows:

- "Butler County, Kansas, Rural Water District #5, Benton, KS, Water Rates Model 4023-4." Later this model will just be called, "Model 4." (There were Models 1, 2 and 3, and many others, too. The appropriate aspects of all have been incorporated into Model 4.) Model 4 assumes the District will continue to purchase water from Wichita and El Dorado, and the District will make many system improvements, primarily building new water lines and a new water tower largely to support a rapid growth rate.

As you read this report, please keep this in mind. The report does not *direct* RWD #5 to do anything. Actions you take or do not take are strictly up to you. The report is meant to inform and educate so you can make well-informed decisions about actions to take. And the report and models are not legal recommendations. For legal issues consult your attorney.

About Model 4, Generally

The Model was built to match the system's financial statements and other data as much as possible. Because incomes and expenses in standard financial statements, and other data, are seldom grouped in such a way as to enable the required rate calculation methodology, the Model does not always match financial statements.

For modeling purposes, it does not matter whether funds are held in the general system account, a debt service sinking fund, repair and replacement account, etc. Therefore, the Model accounts for funds in a more simplified way than most utilities do it. When it comes to segregating funds, staff knows best how to do that, so the Model does little in this regard and leaves the segregating up to staff.

Several line graph charts in the Model graphically depict some things which would be difficult to pick out of the tables. In all the charts, the **blue line** represents what would happen under the **modeled** rates and the **red line** under the **current** rates. Financial trends for the red lines are (generally) bad. Those for the blue lines are (generally) good. Review the definitions section of Model 4 to learn the meaning of terms used in the charts.

I will say it simply, like this. Chart 8 depicts reserve levels under the existing rates (red line) and the modeled rates (blue line). When the blue line goes up, that is a good thing for the utility. When the red line goes down, that is a bad thing, at least, if you were to decide to keep your current rates for very long.

In contrast to Chart 8, Charts 3 and 4 in the Model depicts user rates. When the Chart 3 and 4 blue lines go up, meaning rates are going up, customers do not like that. But the utility will be better funded as a result and that benefits ratepayers because it makes their utility more resilient and able to make improvements that will serve them better. Recall, effectiveness is the first priority. Efficiency (low cost, as customers view it) is the second priority. Customers <u>want</u> efficiency but they <u>must have</u> effectiveness.

Ratepayers ask, "Why should I pay more?"

Nearly every ratepayer served by every one of my client systems wants to keep their current (lower) rates. No one wants to pay more for their water than someone "down the road." That is human nature. We are wired that way, and that is not a bad thing.

Nearly all my client systems have system improvements they need to make. They cannot fund them out of current revenues. That is why they have a backlog of improvement needs. Quite simply, rates need to go higher, so improvements can be done. While your rates may go higher than those in other systems nearby, that is likely a temporary situation. Those other systems have a backlog of improvement needs. Once they start to attack that problem, their rates will go up, too.

Saying this will not make anyone feel good about higher rates. But this situation is going on nearly everywhere. Maybe not on the same schedule as you, but their day is coming, too.

One thing you will notice in viewing Charts 5 through 7 is this. Only the red line (current rates) and the black line (goal amounts) show up. That means the blue line, the proposed rates line, is taking the same path as the line depicting the goal. That is because, in the Model, I programmed all funds that exceed what is needed to meet the working capital goal to "spill over" into the CIP and Debt Service fund reserve. Thus, the recommended rates will satisfy the goal, but the current rates will not – they fall below the goal.

Charts 6 and 7 do the same thing. Chart 8 spells the difference between the two sets of rates. The modeled rates will generate more revenue over time and, thus, produce stronger total reserves.

As you set and later reset rates, I suggest you follow the guidance I give in my book, "How to Get Great Rates." This book is one of the rate setting resources I mentioned earlier.

The remainder of this report directly addresses the analysis findings and my recommendations.

Meter Size-based Rates

You currently assess meter size-based minimum charges and new connection fees. You should continue that practice, but adjust some of the rates, so they will be cost-based. Tables 11 through 16 of Model 4 cover calculation of these fees.

During most of the test year, which ended December 31, 2022, the Town of Towanda paid no monthly minimum charge. Starting September 1, 2022, Towanda began paying a $150 per month minimum charge. In addition, Towanda's unit charge rate changed at that time from $5.25 per 1,000 gallons to $5.74 per 1,000 gallons. Because this rate changed out of sync with all others, I calculated the weighted average unit charge of $5.37 per 1,000 gallons as the average for 2022. As to the minimum charge change, I assumed for modeling purposes that did not happen until after the test year ended.

Contract water formerly was assessed no minimum charge, only a unit charge. Starting September 1, 2022, contractors began to pay a minimum of $100 per month. Because that does not sync with rate changes for all other customers, I assumed for modeling purposes that did not happen until after the test year ended.

Both above minimum charges generate negligible revenue, so these assumptions have little effect on overall revenues. However, I recommend the contract water minimum charge be the same as a stationary meter of the same diameter.

Expected Incomes

Table 3, page 40, shows the various past incomes and future incomes to expect, as well as several other things related to revenues. The modeling assumes new rates will be adopted in time to begin assessing at those rates on July 1, 2023. That comes up soon, so you would need to move quickly.

Near the top of the table, the growth rate in new connections, which goes hand in hand with system development fees is assumed to be 45 new taps per year for the next ten years. That is down from 55 new connections last year and the 55 expected this year. Why 45 new connections per year in the future? Future new taps are assumed at one-tenth of a potential 450 new connections in two subdivisions now under consideration by developers.

The system development fees calculated in Table 13, page 55, and brought back to Table 3 as a revenue are analogous to the sum of the fees you currently call the "Benefit Unit Charge" and the "System Development Charge." System development fees were calculated to recover such costs in proportion to the ability of different meter sizes to need peak flow capacity, but the total recovery of such costs was "sized" to keep the District's system development fees fairly competitive with the fees of Wichita through the four inch diameter meter size. In Table A, page , the modeled system development fees were broken out into your current structure – a system development charge and a benefit unit charge.

Tapping charges, plus any other out-of-pocket costs to initiate a new connection should continue to be assessed in addition to the system development fees in Table 13, because those costs are not included in the system development fees I calculated.

Because of timing for adjusting rates and fees, some membership fees in the first part of 2023 would be collected at the current rates. After fee adjustments, they would be collected at the new rates. Those are called "Adjusted Meter Size-based System Development Fees (Tables 13, 14, if applicable)" on the next line. So, 2023 is a "blended revenue" year. In 2024 you will see that fees at those new rates are nearly the same as they were in 2022. That is because I modeled the new fees to be the same for a small meter new connection but they would rise for larger meters based on the peak flow capacity costs those larger meters cause. The slight reduction in the new fees level is because I assumed slightly slower growth in 2023 than occurred in 2021. Thus, the average new membership fee will go up but because growth is projected to slow a bit, membership fee revenues will go down slightly for 2024.

In Table 3, page 40, near the top, on the line called, "Rate Increases Projected for Future Years," I recommend future across-the-board increases of four percent each year. In Table 4, page 41, note that I assumed inflation in the system's budget will rise by four percent per year, too. Thus, future rates need to match inflation in each year's budget.

"Other Income" at the bottom of Table 3 is almost exclusively for new meter sets, line installations and other things done to support new memberships or connections. Therefore, I grew this revenue in the future by the rate of new growth that is expected.

Also, at the bottom of Table 3, about 75 percent of "Aid in construction" is related to supporting new connections, so I grew this revenue in future years by three-quarters of the rate of customer growth.

Expected Operating Costs

Table 4, page 41, shows expected operating costs. In consultation with the district's manager, I expect most operating costs will inflate by four percent per year. However, utilities, water purchases and other cost items that are flow-related will also increase by the rate of growth in new connections. Those items are highlighted gold.

Depreciation is not normally funded, meaning, the dollar amount of depreciation is not normally deposited into an account and later used for replacing infrastructure. In your case, I understand part of the depreciation amount you include as a cost actually is used for replacing equipment and paying other system costs. Therefore, I transferred the depreciation amount shown in Table 4 into the "account" represented by Table 5, page 43, as a funding source for capital improvements. In other words, the depreciation "cost" is factored into the rates the Model calculated, so the resulting revenue is available to pay for capital improvements and debt. This "revenue" will be enough to pay debt service on system improvements until about 2025. It will remain a substantial revenue source in the future.

To make calculation of a few financial indicators accurate and simple, I do not include as "operating costs" those costs associated with building and financing capital improvements. Those costs are covered in Table 5.

Capital Improvements and Expected Balances

You have need for making several expensive system improvements. I assumed you will use USDA Rural Development loans, as is you current practice, to fund these improvements. These things are covered in Table 5, page 43.

Repair and Replacement Scheduling

RWD #5 currently handles equipment repair and replacement (R&R) needs as it prepares each year's budget. Thus, most R&R needs are imbedded in the costs in Table 4. However, in consultation with the district's manager, we estimate the district needs to spend an additional $75,000 per year in current dollars to fully cover R&R needs, so I included that amount in Table 6, page 45, as an annual cost.

The annual annuity needed to cover $75,000 per year as costs rise with inflation, plus an additional annual payment to bring the R&R reserve to the desired level in 20 years. That amounts to a total annuity of $113,059. That appears at the bottom of Table 7, page 46, and is carried back to the bottom of Table 4, page 41, as an annual operating cost.

Said simply, include the $113,059 in future budgets, "deposit" that into an account for equipment repair and replacements and the balance in that "fund" will be available to pay for replacement of rolling stock and wear-out items like pumps, motors and the like as those needs come due.

Target Reserve Levels

According to your recent and projected balance sheets, your total reserves are higher than I recommend for a system of your size. But it is prudent to maintain strong reserves, so I modeled rates that will enable you to maintain that reserve level.

I rarely recommend lowering reserves and I do not recommend you do so, either. But the following shows you what I normally recommend for systems that need to build reserves:

1. Unobligated cash and cash equivalent reserves equal to at least 35 percent of the annual operating costs, not including debt service and general administration costs;
2. A 20-year repair and replacement (R&R) schedule reserve, in the 20th year equal to at least two times the average year's cost of R&R, and
3. Capital improvement and debt reserves at the end of the tenth year, after debt is paid, equal to that year's debt payments plus cash-paid capital improvement expenses.

The lines on the bottom of Table 17, page 59, and several of the charts at the end of Model 4 show the reserve balances to expect for the next ten years. The last line of Table 17, the "Sum of All Reserves," is the critical one. Reserves will remain quite steady, even as you tackle capital improvements and incur new debt.

You should keep these things in mind as you approach the improvements in a few years.

Chart 8, page 65, graphically shows how reserves will perform over the next ten years. As that chart shows, under the current rates, reserves will decline. Under the slightly higher rates, they will stay rather steady.

Projecting budgets and ending balances for next year is a difficult task. Doing the same five years out, I can usually get close. Ten-years out, there are so many assumptions we must make now that will not pan out years from now that you should not bank on those numbers. But they serve as good planning targets. In most cases, a utility will see big cost, income, growth, debt, and other changes looming on the horizon a few years out. When that happens, it is time to do a new rate analysis to get rates back on track to meet those challenges. Thus, target balances give you something to aim for, but the target will move over time. With each new rate analysis, we will bring you back on course.

What if Total Expenses in Model 4 Miss the Mark Someday?

First, missing the mark is a certainty. Eventually, the projected expenses will miss the mark. That is why analysis needs to be redone periodically. With time, things change.

If you adopt the Model 4 rates, then in a future year it turns out Model 4 failed to accurately predict the expenses you experience, what should you do? That depends upon which way (higher or lower) your expenses went, and how much they veered off course. It may depend upon which expense(s) varied because that could markedly affect cost structure, and therefore, rate structure. And it will depend upon what happened to revenues, too.

- Your "fix" for a situation may be to continue with future rate adjustments as recommended. Not all "misses" need to be addressed. Some right themselves.
- Or it may be to speed up or slow down future inflationary increases to get revenues and reserves back on track.
- Or it may be to do a proportional increase to minimum and unit charges based upon the percentage that the experienced expenses are higher or lower than those in Model 4.
- Or it may be to give me a call if you are not clear about how to make the needed adjustments.

My suggestion is this. When in doubt, err on the side of calling me for advice. I can usually talk folks through how to make the appropriate adjustment and I do not charge for that.

If your new situation requires modeling, I probably will request a fee for that. In that case, would estimate the hours needed to do the analysis adjustment and I would propose to do that at the hourly rate I used to calculate the fees for the original project. Most such projects, including the reporting out, take a day or less to do, so they rarely go over $1,000.

If "getting back on track" is a problem several or many years into the future, many issues could then be in play. In that case, it is time for a new rate analysis.

The critical point is this. Do not hesitate to make the recommended rate adjustments because you are not positive it will work out. Make the adjustments and then track how it works out through the years. If you get concerned about something later, just call. I cannot say, "I have seen it all." But I have seen a lot. I probably can work you through any rate setting situation you will experience.

Rate Affordability

I calculate each rate analysis client's rate affordability, measured by the Affordability Index. For most utilities, it is a very useful tool to assess how "cheap" or "expensive" their rates will be. The Affordability Index is also used by many grant and loan programs to determine if an applicant will be awarded a grant, how much grant, an interest subsidized loan or no funding assistance at all.

Because your service area is not aligned with a city or full county boundary, I do not know for sure what the median household income is for the District. Unless you did an income survey of RWD #5, income data that specifically applies to RWD #5 probably does not exist. Therefore, I used income data for all of Butler County. You may have a good sense of the average income for households in your service area compared to the entire county. Keep these things in mind as you read on.

Income growth, as determined by the Census Bureau, at an average of 1.81 percent per year over the last 20 years through 2019, may not be accurate for your area, but I used that value for modeling purposes. Incomes and income growth rates are shown in the top left corner of Table 3, page 40.

Residential water use in RWD #5 averaged 4,113 gallons per month. That is lower than the national use benchmark for affordability of 5,000 gallons per month, but in line with use in rural areas. Thus, the bill for the average use in your service area will be lower than what the Affordability Index indicates, meaning, your actual average bill is cheaper than that shown by the Affordability Index. Whether the Affordability Index "fits" RWD #5 or not, the Affordability Index is still an important indicator to track.

In Table 17, near the top, I show the estimated Affordability Index. The Affordability Index is also shown graphically in Chart 4, page 63.

In the table, the Affordability Index calculation for the test year was 1.33 percent. That means, a 5,000 gallon per month residential customer earning at the County's average income level paid 1.33 percent of their monthly household income to pay their monthly water bill. That national average is thought to be approximately 1.0 percent, so your current rates are a bit above average.

Affordability Index: The monthly charge for (typically) 5,000 gallons of residential service divided by the median monthly household income for the area served by the system. An index of 1.0, meaning a household pays one percent of its income to pay its bill for 5,000 gallons of service, is generally considered affordable. The Affordability index is a primary factor in determining grant and loan eligibility and grant amount.

Under the modeled rates for fiscal year 2023, the first full year at the new rates, this customer's Affordability Index would go down slightly to 1.30 percent. In future years, the Affordability Index will rise gradually.

The affordability index does not depict how new rates will affect customers using different volumes. Table 18, page 60, shows "before and after" bills for customers using different volumes of water. The average residential customer's use is highlighted in gold in the table. Table 18 gives ratepayers useful information. It is one of the few tables from the Model that I recommend you copy and bring to the Board meeting as a handout for the public. Because most customers are concerned about what will happen to their bills, you should give this table to everyone who wants a copy.

Model 4 Rates – How to Implement

These are the rates I recommend you adopt.

In the following, I summarize most things you would need to do to get set on this course of rates. In the table that follows, I list the rates and fees you would adopt initially:

1. Table A that follows this list states the rates and fees derived from Model 4. I call this set of adjustments the "initial rate adjustment."
2. The calculations assumed you would have made the initial rate adjustments early enough to begin charging at the new rates starting with the bills that will be payable on or about July 1, 2023. You would need to satisfy all Statutory requirements for making rate adjustments in advance of billing at the adjusted rates.

3. Inflationary increases should start the year following the initial adjustments. I assumed you will need to raise all minimum and unit charges by 4.0 percent, but whatever the budget inflation rate is expected to be each year, raise rates across-the-board by that percentage rate.
4. When making inflationary increases, you should examine the costs and incomes the utility experienced during the then current year, plus the balances that have accrued. Compare those items to the same items in Tables 3, 4, 5 and 17, of the Model for the year in question:
   a) If all criteria are performing close to the values in the Model, raise all rates by 4.0 percent, as shown near the top of Table 3, page 40.
   b) If criteria are not performing as shown at the bottom of Table 17, page 59, but they are not egregiously different, follow the instructions in Chapter 9 of the book, "How to Get Great Rates" for how to make inflationary increases correctly, adjusting for variations in incomes, costs, etc. Download that book for free from https://gettinggreatrates.com/Freebies.
   c) If any criterion is performing poorly by an amount that is troubling to you (balances too low, incomes too low, expenses too high), call me to discuss the situation. It is likely I will be able to "talk you through" how to make appropriate rate adjustments to correct the situation. If not, I can do a model revision for a small fee.
5. I normally recommend repeating Number 4 each following year until you have raised rates and fees by a total of 20 percent. However, if your costs, capital improvements, debt and other things change dramatically over the next few years, I suggest you get a new rate analysis done when it seems to you it will be most productive. Otherwise, if these criteria are near what I modeled, and they usually are, you may not need the next analysis for several additional years. A subsequent rate analysis would likely be useful just before you solidify plans for a major system improvement. That would let you use the analysis to support planning. When rate analysis time arrives, have me or another rate analyst of your choice perform a new rate analysis.

Table A: Rates From Model 4

Table A: System Development Fees; Minimum and Unit Charges; and Usage Allowance Calculated by the Butler County, KS RWD #5, Water Rates Model 2023-4

Water Meter Size in Inches	System Development Charge	Benefit Unit Charge (BUC)	Monthly Minimum Charge, Including Peak Capacity	Usage Allowance in 1,000s	Unit Charge per 1,000 Gallons
0.625	$16	$4,000	$30.00	0.000	$9.78
0.750	$16	$4,000	$30.00	0.000	$9.78
1.000	$1,040	$4,000	$36.59	0.000	$9.78
1.500	$1,748	$5,000	$50.64	0.000	$9.78
2.000	$2,797	$6,000	$67.51	0.000	$9.78
3.000	$7,285	$8,000	$120.90	0.000	$9.78
4.000	$14,505	$10,000	$196.78	0.000	$9.78
6.000	$37,482 - BUC	per Bid	$387.87	0.000	$9.78
8.000	$98,950 - BUC	per Bid	$809.41	0.000	$9.78
10.000	$146,759 - BUC	per Bid	$1,202.84	0.000	$9.78
Contract Water	N.A.	N.A.	$100.00	0.000	$11.78

Note: For larger meter sizes, the system development charge would be the dollar amount in the "System Development Charge" column, minus the bid amount for each installation as it is bid.

Closing

If you adopt the recommended rates and fees, and if future costs, growth, and other assumptions come to pass, you will build prudent reserves and fully fund the utility for several years to come. Those rates will bill customers fairly for the service they use. Of course, keep in mind that your future capital improvement costs are going to increase. Future analysis would be useful as a planning tool for those improvements.

It is important that you examine incomes, costs, and accrued balances each year to assure the rates are bringing in adequate revenue to meet needs and maintain reserves. If they are not, increase rates across-the-board by a percentage that will bring the balances up to where I calculated they need to be each year.

This combination of initial adjustments will result in an overall increase in water revenues that in my experience is nearly inconsequential. The bill increase for your average small meter residential customer will fall just slightly. Bills for slightly more use would rise slightly to the bill increase rate would “max out” at seven percent at around 100,000 gallons of use per month. Because the current minimum charge for several of the larger meter sizes is set too low, on a cost-to-serve basis those bills would rise more.

Conclusion

"Conclusion" is a misnomer here. This report provides information to help RWD #5 make decisions. Thus, it begins the process by which you will initially adjust rates and fees and take other actions. I will continue to help you as you do that, so always feel free to call me to discuss any concerns you have as the years pass. Having the Model available to track your progress and determine the effect of condition changes later, I should be able to test changes easily and advise you quickly.

As time passes you will need to adjust rates incrementally as modeled in this report and as described in more detail in my book. Eventually, you will start this cycle over.

As you take on the initial adjustments, keep the following in mind.

- Everyone impacted by RWD #5's water rates should at least be made aware of the results of this report.
- My default recommendation is to give any customer as much information as they want. If they want a copy of the full report, give them that.
- If media takes an interest, give the media a copy of the full report so they can quote the report directly and accurately rather than be forced to "figure things out." Much of this is very complex. Few people know how to, or have the time to, calculate utility rates. Make it easy for everyone to get the facts right.
- For most customers, what would happen to their bills is as much as they will care to know about this analysis. To satisfy those information needs, RWD #5 can publicize the current and modeled rates and/or the bill comparisons.
- A few customers will want to know more, especially high-volume customers. Give them the full report if that is what they want.
- A good way to accomplish these things is to post the report on RWD #5's Web site, Facebook page or other social media, so everyone can see for themselves what the report says. That way, no one would have to print out a long document, unless they wanted to. Publicize the posting widely and publicly. Information is a good thing. ***Being seen*** as trying hard to get information out to folks is also a good thing.

Appendix A: Rate Analysis Methodology and Related Issues

Rate Setting Resources Beyond This Report

Over the years, I have found that several topics are common to many utilities. Others can be important to a utility at certain times in their development. Rather than cover such issues here, I cover in separate guides and a rate setting book, all available for FREE download at https://gettinggreatrates.com/Freebies. Following is a listing and descriptions of a few those guides and resources:

1. How to Get Great Rates© (e-book) – The book focuses on basic rate setting issues. It is most applicable to smaller, simpler systems.
2. Rate Setting Best Practices Guide© – This guide expands upon the book to cover affordability, sustainability, bill assistance programs, meter size-based system development fees and minimum charges, and more.
3. Rate Setting Issues Guide© is just that.
4. Replacement Scheduler© is a spreadsheet application that enables users to build their own equipment repair and replacement schedule, which calculated the annuity (savings amount) needed to fund all items in the schedule.
5. CIP Planner© is a similar spreadsheet application for capital improvements planning.

The two spreadsheets were extracted from my rate analysis model template and made a bit more user-friendly for do-it-yourselfers. I encourage my rate analysis clients to use these two sheets so they can make repair and replacement and capital improvement plans more formal, more forward looking and less reactive. Plus, the sheets make data gathering easy for clients and me.

There are other guides and resources on this site. All are FREE, so check them out.

Recommendations for Policy and General Issues

Many of the following things you probably are already aware of or are already doing, but they are worth repeating. A comprehensive list of rate setting best practices is presented in the "Rate Setting Best Practices Guide," cited above.

Whether your entity is a city, town, district, or utility authority, you can use the following as a checklist of "to-do" tasks for rate setting and rate analysis. If a reference you see in the following does not quite fit your situation, consider how you can apply the information to your special situation:

1. It is easy to export data from a robust, user-friendly billing program. Your staff gathered volume usage data from that program for my analysis work. For you to examine payment history and problems, usage trends, new connection trends, the effects of usage allowances and other rate structures on revenue generation, and many other issues, you

must have a billing program that is user-friendly and robust. If your current billing program is not as usable as you would like, I recommend you acquire a program that is. A good first contact to research billing programs is to contact the rural water association.

2. You should charge for the various services staff perform for customers and others. These include various services you provide in the field, such as after-hours service, meter disconnects and reconnects, special meter readings, etc. Just driving to a customer's site takes a minimum amount of time. That is time the staff person cannot perform other duties. To assess appropriate fees:

    a. You should periodically determine how long it takes to drive to and back from the average site and to perform each service.

    b. Determine how much it costs the utility per hour, on average, to have staff perform these services. Include staff wages, benefits, taxes, use of utility vehicles, tools, and minor equipment, etc.

    c. Include a fair amount to cover the time that office staff devotes to working on these services to track them, bill for them, etc.

    In almost all cases, these estimated costs should be recovered with fees for the various services. In addition, set a minimum that you will charge for showing up. In that minimum fee, grant a certain amount of time spent on-site, such as 10 minutes for a special meter reading or 30 minutes for a meter change-out.

    In essence, set your fees in the same way plumbers and similar technicians do – a set fee for showing up, which buys the customer a set amount of time, and an hourly rate if the job takes longer than the show up charge will cover.

    While accounting for time and other investments in the various services staff perform is important, do not make the costing process burdensome. For many services you likely can just estimate staff time occasionally and charge fees based upon those estimates.

3. Retain required funds in interest bearing debt service and debt reserve accounts when required by your lender(s).

4. Have me or another rate analyst of your choosing conduct a full rate analysis again when the ***actual*** financial performance and my ***projection of future*** performance diverge significantly. Conditions should dictate rate analysis timing. Most utilities benefit from rate analysis on about a five-year cycle or when total costs have risen by 20 percent. But if you are planning to do significant capital improvements that were not previously included in the rate modeling, or when actual improvement costs or funding plans have changed significantly compared to those that were modeled, those factors call for a new rate analysis.

5. Fully adopt management strategies that are included in what is commonly called, "advanced asset management." These strategies can yield better service and reduced costs for a utility, especially those looking to build new facilities or replace existing facilities soon. At a basic level, you can use my free spreadsheet tools called, "CIP Planner©" and "ReplacementScheduler©" to do capital improvement and equipment repair and replacement scheduling, costing, and annuity calculations. These functions are at the core of asset management and may be all, or nearly all the "asset management" a small, simple system needs to do. Download these tools and others from https://gettinggreatrates.com/Freebies.
6. As a reminder, check with your attorney for language and legality of all issues discussed in this report.

Cost-based Rate Calculations

To give you a synopsis of rate analysis, as I do it, and to make it easier for you to read and understand my findings and recommendations, a tutorial on my methodology is in order. Most situations are simple enough that I do not need to use all these methods, but it will serve you well to know the breadth of my methodology.

When I analyze rates for a government-owned water-based utility, and other utilities that are empowered to assess cost-of-service rates, I use the cost-needs approach. The approach is exhaustively described in the American Water Works Association's "M1 Manual, Principles of Water Rates, Fees and Charges," Seventh Edition. This manual, in use since the 1960s and periodically updated, is considered by many to be the "Bible" of water rate setting best practices.

While the manual focuses on water rate setting and uses terms, units of measure and other things specific to water, the principles and approaches work just as well for electric, sewer, stormwater, trash collection and other utilities and services that are paid for with rates and fees. One just needs to use the appropriate units of measure and a few conventions common to the other types of utilities and services when applying these principles to them.

The cost-needs approach is a static (one year) rate calculation. One could do a new rate study every year to arrive at the rates to assess each year. But that is a lot of work or expense with very little practical benefit to be gained.

Important Terms

The cost-needs approach results in rates that are called, "cost-to-serve" or "cost-of-service" rates. Simply stated, the costs for a targeted budgeting period, usually a year during the next five years, are classified as "fixed," "variable," "capacity-to-serve," or some combination of the three.

- Fixed costs are converted to a base minimum charge.
- Variable costs are converted to a unit charge.
- Capacity costs are converted to some combination of system development fees and surcharges to the base minimum charge.

A typical rate study considers the rates needed to fund one year, usually the coming fiscal year. Utilities need to plan farther into the future than that, so I calculate rates for ten years into the future, hence, the more accurate term of rate "analysis."

Most utilities are better served by getting a rate analysis only when rate restructuring may be in order or when rates will need to go up markedly. During the years in between rate analyses, it is then simple and convenient to just raise all significant rates and fees by an across-the-board percentage. Such increases may be aimed at keeping up with inflation. Or they may be designed to achieve other goals. In whatever way these increases are to be done, they were planned for in the analysis and described in the foregoing report.

To guide utilities to do future increases well, I expand the cost-needs approach by projecting costs, revenues, rates, and other criteria ten years into the future. That gives each utility a "road map" of what they can expect in the future, so they can reset rates appropriately.

Because I intend for utilities to reset rates on their own for some years into the future, and I want those rates to be "fair enough" to serve them well, I calculate the initially restructured rates so that they take future across-the-board increases into account. This is how it works.

Based on my calculations, the initially adjusted rates will be closer to a "cost-to-serve" structure than the current rates. And as across-the-board increases are applied, rates will move even closer to a cost-to-serve structure until the year used for cost classification has arrived. After that, additional across-the-board increases will move the rate structure further away from cost-to-serve. Eventually, a new rate analysis should be done to make the structure fair again.

To arrive at cost-to-serve rates in a future year, I must choose an appropriate year for cost classification.

- The best year may be the first year after a big capital improvement is planned to be finished and the debt service for that improvement will have already started.
- Or, if costs are expected to inflate uniformly, the best year may simply be five years in the future, the year in which most utilities should consider having a new rate analysis done anyway.

Rate Analysis, in a Nutshell

At its simplest, rate analysis helps a utility arrive at rates and fees that are adequate – they will pay all the utility's costs. The next level of complexity is to arrive at rates that, on an average cost basis, will enable the utility to recover fixed and variable costs "fairly." Most small water and sewer utilities need analysis only to this level of complexity – doing more than that results in rates that are impractical for small systems.

Another level of complexity includes calculation of meter size-based minimum surcharges and system development (connection) fees. Another includes calculation of rates on a "marginal" cost basis, for special groups of customers. Yet another level is marginal cost basis calculation of rates for individual customers, such as a wholesale customer. These facets of analysis result in accurate but complex rate structures; appropriate for the larger utility with diverse customers.

Analysis can and should provide a sound basis for advising the utility to "go or don't go" concerning various actions it might take. Some of these actions are purely financial. Some, like the decision to enter into, or not enter into, a wholesale supply agreement, for example, include "hassle factor" and other non-financial issues. And because such are agreements are made for nearly forever, a mistake made in the beginning can hamstring a utility for years or decades to come. Regardless of system size, thorough analysis should always be done before entering into such agreements.

There are some basic steps to arrive at cost-to-serve rates. Calling these "steps" implies that I do one and then move on to the next. In practice, most steps are affected by, and affect, what happens in other steps. Therefore, they are all done in concert with the others.

That said, here are the basic steps:

1. Cost Classification: Operating costs are placed into different categories – fixed, variable, and sometimes others. I classify costs projected for a year in the future, usually within five years of the present. And I use a year that appears to be typical of what the utility can expect in the future.

   For all utility types, operating cost classification is done in Table 8 of the model(s) that will follow in this report. The core notion of cost-to-serve rates is this: The basic minimum charge assessed to all customers should recover the sum of all fixed costs; and the average unit charge should recover the sum of all variable costs. It is more complicated than that but understand that notion and you will understand cost-to-serve rates fairly well.

   Near the bottom of Table 8 you will see the "Average Fixed Cost/User/Month" and the "Average Variable Cost to Produce/1,000 gallons (or other units)." These are the basic minimum charge and the average unit charge based on the costs expected in that future year. The same model template is used for calculating rates for the various utility types. The main difference for those analyses is the measurement method for unit charges.

An aside, but an important one in my mind, is this. The M1 Manual describes how to calculate cost-to-serve rates down to the customer class level. If a rate analyst classifies costs to that level and the utility sets rates that achieve that result, it can correctly be said that the utility has cost-to-serve rates. Those rates will be fairly structured, but only at the customer class level.

I take cost classification one step further, to the customer level. Thus, rates that I calculate are cost-to-serve to the customer level. My reasoning for doing this is, rate structure fairness if felt at the customer level, not at the customer class level. Customers pay utility bills. Classes do not.

2. Capacity costs: In the ideal, capacity costs should be assessed on a cost-to-be-able-to-serve basis, but these costs are a long-term proposition. No one knows at present what the cost of capacity is because those costs unfold over decades. Thus, the dollar cost of capacity can only be estimated, but that is not a problem. The key is, whatever one estimates capacity will cost, or whatever portion of capacity a utility desires to recover with capacity charges, that cost should be divvied out to new connections and current customers on a fair basis. The following goes to that goal.

   - The American Water Works Association has done excellent research on the sustainable peak flow capacity of different water meter sizes and types, so I generally use the flow capacity of each meter size and type as the basis for divvying water and sewer peak flow capacity costs. That math is lengthy, so it is spread out over Tables 11 through 16 of the model(s).
   - The notion of capacity applies to all utility services, so when I calculate water and sewer rates where meters are used, I use meter flow capacity as the capacity share criterion.

- When I calculate electric rates, I use what is commonly called the "demand" exerted on the wholesale power supplier. If the client produces its own power, I use the demand measured by the client's metering system.
- When I calculate sanitation (trash collection) rates, I use the cubic foot capacity of the various bin and dumpster sizes times the number of pickups per month of each as the capacity criterion. Thus, for trash collection services except for the rare ones that actually weigh trash as it is collected, the capacity of bins times the pickup frequency becomes a component of the unit charge for each customer.
- Stormwater capacity is like trash collection in that impervious surface area is the usual capacity, and unit charge criterion. Square footage or the equivalent of impervious surface area appears in the rates as the unit charge analogue.

3. Future cost projections: I project costs ten years into the future. Generally, this is done by applying an expected inflationary factor to each cost. But it is also common that some costs, like the cost of debt service needed to build a new treatment plant in two years, will change future costs markedly. Such cost changes are estimated, then entered into the model in the year in which they are expected to occur. Some expenses, like postage, treatment chemicals and electricity for production, treatment, and distribution, rise with inflation plus growth in the customer base or use. Those are increased in future years by inflation and growth.
4. Reserves: Reserve goals are set through the tenth year. Those goals will only be met if (primarily) rates are set high enough and/or (secondarily) grants and subsidized loans are large enough to enable the utility to generate net revenues over the modeling period. The amount or percentages and types of reserves are dependent upon each utility's needs, so that is discussed in the foregoing report.

For the techie reader, the analysis model we use – a Microsoft Excel spreadsheet application we call, "CBGreatRates" – is usually 3.8 mega-bites in size. Each rate analysis includes one of these sheets.

For a 1,000-connection utility, for example, we use another spreadsheet, 12.1 mega-bites in size, to sort and calculate customer volume use. We use one of these sheets for each rate class. There are usually five or so for the simplest rates. Each of these sheets is linked to the client's usage data file, usually a few mega-bites in size, for importing usage data. Thus, an analysis for a 1,000 connection utility totals 65 or so mega-bites in size.

For some of our larger client utilities with more rate classes and more customers, total size of all the linked spreadsheets runs over 250 mega-bites. We run computers with lots of RAM and memory but some of the calculations for a larger utility can take around 90 minutes to run. When usage data sheet runtimes get long, we usually switch to a database format application to speed up the heavy number crunching.

5. Calculate rates: The full suite of rates needed to fully fund the utility and do it fairly is a dynamic set of calculations, too complex to completely explain here. And each situation requires variations on this theme. I will leave out some details, so this is the "Cliff's Notes" version of rate calculation:
    - Capacity cost recovery is calculated first. Likewise, penalties collected, and other incomes are calculated. These revenues are deducted from the total revenue need to arrive at the revenues needed from user charge fees.
    - Next, the across-the-board future rate increase rate (a percentage) is then set. In the future, starting about one year after the initial rate adjustments have been done, rates will increase annually by this percentage. The revenue needed from the initial rate adjustments, here called the "net revenue need," will come from the revenues generated by the initial rate adjustments. (In truth, future inflationary revenue increases, plus interest earnings on balances accrued are dependent upon the rates that are initially set, so most "pre-calculated" revenue streams are adjusted dynamically as initial rate revenues rise or fall.)
    - The calculated bases for fixed costs and variable costs (Table 8) establish a ratio of the revenues that each rate component would generate in a cost-to-serve structure.
    - To increase (or very rarely decrease) overall revenues to satisfy the net revenue need, each revenue stream is increased or decreased by the same percentage. Thus, the revenue streams remain in the same ratio to each other. That means they retain their cost-to-serve proportions.
    - Once the overall revenue increase (or decrease) is established:
        - The base minimum charge is "back calculated" from the adjusted minimum charge revenue amount. (Every customer, regardless of their meter size, pays the base minimum charge.) The meter size-based surcharge, for water and sewer systems, is added to the base minimum charge to arrive at the full minimum charge for each meter size. (Similar math is done for other utility types.)
        - The average unit charge is calculated from the unit charge revenue amount. If inclining or declining rates are to be assessed, or if there is to be a usage allowance, unit charge revenues are calculated dynamically based on those variations.
        - The resulting rates are the starting user charge rates – the initial adjusted rates – what you will (hopefully) adopt initially. In later years, you will increase these starter rates and fees across-the-board by the inflationary factor, generally to keep them tracking with rising costs.

- After examining balances projected for future years, the future inflationary increase rate may be raised or lowered to enable the utility to accrue appropriate balances either sooner or later. That, of course, will result in initial rate adjustments that would need to be either lower or higher, respectively, to offset the change to the future adjustments rate.
- Finally, it is common for managers and decision-makers of utilities to want to "tweak" rates into a different structure, timing of adjustment or in other ways. Having built the model to handle "on-the-fly" adjustments, I model their preferences to arrive at the rates needed to fund the utility as they desire.

6. Reporting out: The culmination of all this data gathering, calculations and more ends up in a rate analysis report like the report this appendix is attached to. The report covers everything that seems to be important and gives the client my recommendations and guidance on how to adjust rates now, and in the future.

   If desired by the client, I present the report, my findings and recommendations, and answer questions, usually at a Council or Board meeting. Before COVID-19 that was always done in person or occasionally by phone call into their Council or Board meeting. During COVID-19, that has been done by remote video. After COVID-19, these meetings could be done either way, as the client desires. Many of my client systems are small and their management had not yet adopted on-line meetings. COVID has changed that, so I expect many of my future "meetings" will be on-line.

Cost-to-serve rates are considered by many, including me, to be the most mathematically fair and defensible rate structure. While I previously described how I do such calculations, it may still be unclear to you why I do calculations like that. The following should help you.

Utilities that serve customers through various meter sizes usually should have meter size-based minimum charges composed of two parts:

- One is the basic cost to make any level of service available to any customer. These are the so-called, "basic fixed costs" that come from the classification exercise. Billing, general administration and similar costs that are the same for all customers, regardless of "size," make up the base minimum charge. To make it easier to understand this concept, and related concepts, I use catch phrases. For this type of cost, the phrase is: ***Fixed costs are related to the fact that you have customers.*** For every customer, the utility incurs one increment of this type of cost.

- The other part of the minimum charge is a surcharge intended to recover all or part of peak flow or unusual capacity costs. These are almost always based upon water meter size because the larger a meter is, the greater is its capacity to sustainably pass peak flows (as determined by American Water Works Association studies). This peak flow capacity relates well to the cost of building infrastructure "big enough" to handle peak flows. ***Capacity costs are related to the fact that a particular customer has a certain capacity to demand flow or service, regardless of how much flow or service they actually use.***

  These surcharges are added to the base minimum charge to arrive at the full minimum charge for each meter size.

  - Larger systems invariably have more large meter customers and that makes surcharging the larger meters worthwhile and fair.
  - However, small systems with few "unusual" customers and few meters larger than one inch often find it expedient to consider even peak flow capacity cost to be a fixed cost, equally sharable by all customers. At some point, there is more to be gained from administration simplicity than exact rate structure fairness.

Unit charges are related to the volume of service received. While unit charges can be structured in various ways, the revenues they generate should be adequate to pay those costs that are related to the flow that customers use.

There are three, unit charge structures that I commonly recommend, depending on the situation:

- Some systems need "conservation rates," or, their administrations simply like the notion of encouraging customers to use less of the utility's services. In this rate structure, the unit charge goes up as volume used goes up. Most of us respond to, or at least we think twice about it, when we are assessed a higher price to buy more of something. Conservation rates are most appropriate in areas with limited water supplies or in a utility that is bumping up against its capacity to produce water.

If you are going to err either on the side of complex rates that precisely assess costs to each customer or simpler rates that round off some of the accuracy corners but are easier to administer, choose simple rates.

- Most systems use, and should use, level unit charges – a unit charge that is the same regardless of how much volume a customer uses. With level unit charges, customers are assessed unit charges on an average unit cost basis. Such rates are the easiest to calculate, they are the easiest for a clerk to explain to a complaining customer on the phone and the revenues such rates will produce next year are the easiest to accurately predict. Most water utilities, and almost all sewer utilities assess level unit charges.

- The last major unit charge structure is called, "declining" rates. These are the reverse of conservation rates. I often call them, "use encouragement" rates. It is popular these days for many to belittle those who do not conserve resources at every opportunity. Declining rates are often scorned for that reason. However, if a system has an ample water supply and ample infrastructure to produce and distribute it, doing so will not cause unintended bad (mostly environmental) consequences; and if the governing body wants to encourage high use (which often entails such users hiring more or better paid workers), declining rates make good sense. Declining rates are most appropriate in areas that have many high-volume industrial users or folks in that area want to attract such users. Declining rates seem to be most common in the industrial east, but they seem to be less popular everywhere these days.

To complicate the aforesaid just a bit, rate setting is first about recovering costs. Job one of utility rates is to pay the utility's costs. But usually, proper rate setting is also about building adequate reserves; funding a capital improvements program (CIP); catching up on needed equipment repair and replacement (R&R); and covering similar needs. Thus, these soon-to-be-experienced costs or likely-to-be-experienced costs need to be factored into rates and fees, as well. Because time marches on and costs usually inflate over time, rate setting should account for the need for future incremental increases to cover inflation. And you cannot just assume that because the utility needs more revenue that your ratepayers will be glad to pay higher rates. Rate affordability, and the public's perception of affordability, must be addressed, too.

Even the simplest rates situation requires some complex and integrated calculations to account for these factors. For that reason, I build a spreadsheet for each analysis that depicts, in virtual reality, the utility's real-life financial and rates situation.

These models are dynamic. When the initial rate increase is set higher, future inflationary increases can be lower. When minimum charges are set lower, unit or other charges need to be set higher to make up the shortfall. When future expenses need to be higher, or lower, or of a different nature, the Model adjusts rates and fees accordingly. Such modeling enables me to do dynamic "what-if" scenario calculations. That enables me to arrive quickly at the "best fit" rates for each utility. Usually but not always, the client goes with what I recommended.

Coincidentally, such a dynamic model makes it easy to calculate rate and other changes over the next two or three years, too. If a change does not affect the cost structure drastically, I can do the same for almost any cost or rate change. If one, two or three years from now, you discover your costs or incomes will be different from what I had assumed, you can call me up, tell me what is different, I will enter the changes into the model(s) and re-run the rates. If the change is small and quick to model, I do that for no charge. If it is more complex and will take some time and usually a written report, I do those projects on an hourly basis. Fees for those usually come in at $500 – $1,000. Some clients find that to be a very accurate and cost-effective way to maintain good rates.

Truth be told, I have been building my template model since 2005. It is the starting place for all my analyses. The template is so robust that I can set a few "switches" here and there, build in a few things that are unique to a new client's situation and soon, I am modeling rates tailored to their needs.

Temptation Happens

I could build a static model that arrived at what I thought was the best rates outcome for a client. If the client asked for something different, I would be tempted to tell the client that, "In my experience, blah blah, blah, that would not be a good thing to do." Based on my experience, I probably would be right, but that tack would be self-serving – it would save me work.

- Half the reason I build dynamic models is to be able to show the client the outcome of what they asked for and that usually proves up the case for what I originally recommended.
- The other half reason is, when I model what the client asked for, I sometimes find that indeed, it is doable and may even be superior to the solution I assumed was best.

Assumptions based upon deep experience are useful. But facts and good math are a great training experience for a rate analyst.

Two final thoughts on the rate modeling and adjustment topic:

- Almost always, rate adjustments include bill increases. Thus, time is money, often big money, to the utility. A rate increase delayed is a rate increase that must be even higher to reach the same reserve target. Get to know this report well but do not spend months mulling it over. Time will not make your rate setting task easier. Proceed deliberately but quickly and make the needed changes. If you cannot make all the needed changes at the same time, make those that you can as soon as you can. Then, get around to the rest as soon as you can.
- You will get complaints about customers' bills going up. I do not want to be dismissive, but in my experience, most of the time, when the math is laid out for all to see, most people are understanding. Cost-to-serve rate analysis does not arrive at unfair rates. It arrives at fair rates. The degree by which some customers' bills change highlights the fact that rates are unfairly structured right now. Cost-to-serve rate adjustments are aimed at correcting that unfairness. If a customer's bill will go up a lot under the new rates, that means they have been subsidized a lot by other customers. They need to count themselves lucky to have gotten that subsidy before, but fairness demands that those rates should now end.
    - These statements do not mean "do-it-yourself" rate adjustments are always unfair or insufficient, or that "rate analyst" calculated rate adjustments always are fair and sufficient. I always try to calculate and advocate for rates that are fairly structured. But over time, costs and other conditions change, so even cost-to-serve rates I have calculated will become unfair after some years.
        - A good blend of fair rates and low cost to achieve them is this. You get a rate analysis done occasionally and adjust accordingly. For a few years after that, do-it-yourself across-the-board increases will keep revenues tracking with inflation.

Please keep the above summary of cost-based rate calculations in mind as you read on.

Principles

I use several guiding principles when I help systems set their utility rates, fees, and policies. I considered these principles as I prepared the foregoing rate analysis report and the model(s) that follow:

1. Water, sewer, and all other utilities are businesses, regardless of who owns them. The first order of business is, stay in business. Your customers want you to do that. They do not want their investments to be left high and dry without utility services to support them.

2. The second order of business is, perform in a business-like manner. First, be effective. If you do nothing else, be effective. Next, be as efficient as is reasonably possible. Efficiency tends to foster lower rates, which ratepayers appreciate. But effectiveness and efficiency fight against each other. In most utility services and situations, effectiveness trumps efficiency. It does not benefit water customers if you pump lots of water cheaply if that water will make them sick, or if too much of it leaks out of holes in the pipe. Customers also gain more benefit from water rates that are a bit higher than they would like, but that fund the utility sustainably.

3. If a service costs the utility money, the utility should recover that cost from the most logical "person" if that makes good business and community administration sense. For example, generally "growth should pay for growth." Developers should fairly pay for their consumption of utility capacity obligated to them by paying commensurate system development fees. Likewise, service users should pay for what they use. Each class of users should pay their fair share of service costs. Ideally, each individual user should do that, too.

4. It sometimes contradicts point number 3 above, but if adjusting a rate, fee or policy will turn currently "good" customers into "bad" customers, or discourage development that the community desires, you should consider the necessity of making the change carefully before doing it. For example, while it may be warranted, raising the minimum charge markedly to your residential customers may make it very difficult for fixed, low-income customers to pay their utility bill. That may cause more of them to pay late or not pay at all. That may trigger the utility's attorney to write collection letters to those customers and eventually require shutoff of service. Thus, in the attempt to generate more net revenue by raising rates, net revenues may go down due to non-payment and payment collection costs. Likewise, stifling development with uncompetitive system development fees costs a utility in the form of additional paying customers that choose to "build down the road." That forces existing customers to pay all the costs of the utility rather than sharing them with new customers.

> As you consider rate adjustments, always keep this customer in mind:
>
> The "little old lady, widowed, retired, living alone on Social Security." Treat her badly, or just be seen as treating her badly, and you lose the goodwill contest. Lose goodwill and you may never get it back.

5. While cost-based rates are the most demonstrably fair rate structure, purely cost-to-serve rates can be impractical for some utilities. Consider this: a large city with thousands of customers served by a wide range of meter sizes and a wide range of use by its customers, needs rates that are cost-based and, necessarily, those rates will be complicated. Such rate complexity is worthwhile because the utility's situation is complicated. But a small town serving only a few meter sizes and few, if any, customers that use high volumes would not be well-served by complicated rates. Simpler rates are better for them.
    a. However, you or a good rate analyst should still calculate cost-to-serve rates, so even if you adopt something else, you will know what you are giving up.

That is probably more than you care to know about rate analysis but if I did not answer all your questions, just give me a call, or drop me an e-mail.

Butler County, KS RWD #5, Water Rates Model 2023-4

This model calculated cost-to-serve rates, with one variance. That is to keep the current small-meter minimum charge at $30.00 per month (no minimum charge "back sliding").

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Note: This document is a print out of the spreadsheet model used to calculate new user charge and other rates and fees for the next 10 years. These calculations are complex and are based upon many conditions and assumptions. These issues, and others, are described in a narrative report that accompanies this model.

Definitions

Affordability Index	The monthly charge for (typically) 5,000 gallons of residential service divided by the median monthly household income for the area served by the system. An index of 1.0, meaning a household pays one percent of its income to pay its bill for 5,000 gallons of service, is generally considered affordable. Affordability index is often a factor in determining grant and loan eligibility and grant amount.
Analysis Year	The year following the "test year." Generally, rate analysis is done during the year following the "test year" and intial rate adjustments are done later still during the analysis year or sometime during the following year once the analysis shows how rates should be adjusted. See related "test year."
Capacity Cost (also see System Development Charge)	The cost incurred to design and build the infrastructure needed to provide a utility service. As the infrastructure ages and wears out from use, it must be refurbished and replaced, which is a continual capacity cost. Capacity costs are recovered in various ways - connection fees, system development fees, regular user charges and others. The cost of that capacity and the nature of the costs - base flow capacity versus peak flow capacity - should determine the way these costs are recovered.
Capital Improvement Plan or Program (CIP)	A schedule of anticipated capital improvements. These are the more expensive items such as treatment plants, lines and other expensive infrastructure that generally requires bond or grant funding.
Capital Improvement Reserves	Cash reserves dedicated to funding the CIP
Comprehensive Rate Analysis	A thorough examination of a system's operating, capital improvement, equipment replacement and other costs, revenues, current rates, number of users and their use of the system, growth rates and all other key issues surrounding the system. This examination will determine how rates and fees should be set in the future to cash-flow the system properly, to build appropriate reserves and to be fair to ratepayers. It also will determine how policies should be adjusted to enable the system to operate well now, operate well in the medium-range future (about 10 years) and prepare for expected and expectable events such as capital improvements and equipment replacement.
Connection Charge	See system development fee
Conservation (Inclining) Rates	Unit charges that go up as the volume used goes up
Cost-to-produce	There are several ways to define and calculate cost-to-produce. Each is acceptable for different purposes. Generally, cost-to-produce is the total of all variable costs required to get service to a utility's customers during one year divided by the total units of service delivered during that year. This calculation will yield the average cost-to-produce. In a proportional to use rate structure, this is the unit charge. See "Cost Calculations" at the bottom of Table 19.
Cost-to-serve, or Cost-of-service Rates	Rates where, at the customer class level, fixed and variable costs caused by each customer class are paid by that class primarily with minimum and unit charges, respectively. However, this analysis model takes it one step further and calculates cost-to-serve rates at the individual customer level.
Cost Types; Fixed and Variable	The two main types of costs are fixed - those that are related to the fact that someone is a customer; and variable - those that are related to the volume of the commodity delivered to customers. Generally, fixed costs should be recovered with minimum charges and variable costs with unit charges.
Coverage Ratio (CR)	Incomes available to pay debt divided by the amount of the debt for that year. A CR of 1.0 is "break-even." Most systems should have a CR greater than 1.25.
Current Position	For purposes of this report, for one year, the sum of all incomes and undedicated reserves minus all current financial obligations for that year. Future obligations (next year's loan payments) and depreciation are not included. Current position, often called "cash and cash equivalents," is a good measure of liquidity.
Declining Rates	Rates where unit charges go down as the volume used goes up
Fire Sprinkler Systems and Related Costs	Generally, fire suppression in businesses is provided by a built-in system of fire sprinklers. "Service" to such systems is primarily in the form of peak flow capacity availability to fight a fire. Capacity costs money, so larger, more sophisticated water systems should assess at least part of such costs to fire suppression systems. Small water systems usually do not charge separately for these costs, and that is reasonable.
Fixed Cost	Accounting considers a cost that does not change to be a fixed cost. That definition does not work fairly for rate setting purposes. For rate setting, a fixed cost is one that is related to the fact that you have customers. The simplest example is billing, because the utility incurs billing costs not in relation to the volume of service a customer consumes. Rather, those costs are equal for all customers, or they are so close to being equal for all customers that one likely could not justify such a cost being different for one customer compared to other customers.

Definitions

Flat Rates	Rates where all users pay exactly the same fee regardless of the volume of service they use
Equivalent Dwelling Unit (EDU) or Equivalent Residential Unit (ERU)	This definition is for water and sewer service. Based upon number of water using fixtures, average flow, potential flow or similar criteria; the consumption rate of the average single family home is rated at one ERU. All other types of customers are then compared on this basis and multiples or parts of an ERU are assigned to each for billing purposes.
Equivalent Residential Unit (ERU) for Stormwater	This definition is for stormwater. As compared to water and sewer, that are concerned with water flow, one ERU of stormwater service is the average square footage of impervious surface of a single family home. Then, larger and non-residential properties are rated by their multiples or parts of an ERU of impervious surface area for the purpose of billing for stormwater impact costs. When there is a large variation in single family home size and impervious surface area, some cities and similar places use the smaller size range of homes as their ERU standard and assess larger homes at multiples of that ERU basis, as well.
Incremental Rate Increases (Inflationary Increases)	Rate increases done, generally annually, following the initial rate adjustment. The usual goal of such increases is to keep the system's incomes on track with inflation. Such increases are usually small, in the two to five percent per year range.
Initial Rate Adjustments	Rate adjustments done in response to the comprehensive rate analysis. Generally, the goal of such adjustments is to establish rates that cover the system's short-term expected costs and do it with a structure that is fair to ratepayers. Initial adjustments should be followed in subsequent years with incremental rate increases.
Inflow & Infiltration (I&I)	In a sewer system, water that gets into the collection system by way of illicit connections (inflow) such as gutter downspouts, plus leaks in manholes and sewer lines (infiltration)
Infrastructure	Most commonly thought of as the hard assets, such as buildings, treatment plants and lines needed to provide service to customers connected to the system. In reality, staff, software and other "soft" assets should be thought of as infrastructure, as well because the hard assets cannot run well or run for long without staff.
Life-cycle Cost	The total cost to design, build, operate, maintain and eventually dispose of, or decommission, an asset. One asset may cost less to build but it may be more expensive to operate and maintain, yielding a higher total life-cycle cost. Life-cycle cost is an important consideration of asset management.
Marginal Costs	The parts of a utility's costs that are unavoidable in the course of serving a particular customer, a group of customers, more volume to all customers or some other marginal use of the system. Such customer(s) or extra use could be added at a discounted but still profitable fee, if desired. Generally marginal costs are less than the average costs but when extra use requires a system upsizing, they can be greater. These costs are especially useful when considering selling service at wholesale or charging "snow birds" while they are away, for example.
Minimum Charge	This rate, charge or fee goes by other names. "Base charge" and "availability charge" are common. This is the periodic fee paid for having water, sewer or other commodity service made available to the customer to use. Most common is a monthly or quarterly minimum charge. Generally, this charge should recover fixed costs.
Mixed Costs	Fixed and variable costs are defined elsewhere. Costs that are mixed are those that are a blend of fixed and variable. For example, a utility hires staff and provides them benefits partly just to have staff on hand to deal with line breaks, equipment breakdowns and other problems. But most staff time and related costs are incurred because the utility is doing what it was designed to do - provide water or other commodity services to customers. Two gross examples illustrate the extremes of staff costs. In one small water system with one operator, the operator sits around in the shop all day, every day with nothing to do. The cost of that operator is fixed and should be shared by all customers equally in a minimum charge. Another water system has one operator, but that operator works all day, every day operating and maintaining the system. That operator is enabling the system to do what it was designed to do - provide a commodity - so that operator's time and related costs should be considered variable and recoverable through unit charges. In reality, staffing and many other costs are a blend of fixed and variable costs, so they should be consider partly a fixed cost and partly a variable cost.
Operating Costs	Definitions and calculations vary. For rate setting purposes operating costs are costs incurred because a system is operated. Such costs are usually recovered primarily through unit charges.
Operating Reserves or Working Capital	Analogous to current position, this is the net revenues generated during "profitable" years and retained to fund operating costs during times when costs exceed incomes.
Operating Revenues	Revenues collected in the form of user fees and similar operating cost-related fees
Operating Ratio (OR)	Current incomes divided by current expenses, not including debt. An OR of 1.0 is "break even." Most systems should have an OR of 1.25 or higher.
Payback Period	In this case, time required for the investment made to get this analysis done to return that investment through increased user and other fees.

Definitions

Peak Flow Capacity or Demand	The volume of service that a user could demand for a short period of time at full volume use. In water systems, and generally in sewer systems, too, the peak flow capacity limiting factor is usually the size of the customer's meter or service line. In electric systems, demand for each commercial and industrial customer (and sometimes others) is usually calculated annually based upon the peak energy usage during a defined short period.
Proportional to Use Rates	Rates where the minimum charge recovers all fixed costs, the unit charge recovers all variable costs, the unit charge is the same for all volume sold, and there is no usage allowance in the minimum charge. This rate structure is similar to and often the same as cost-to-serve rates.
Replacement Schedule	A timetable that describes equipment replacement and important repairs that are too infrequent and/or too expensive to cover as annual operating costs but not so expensive that they need to be covered as capital improvements.
Replacement Reserves	Cash reserves used to fund the Replacement Schedule
Return on Investment	In this case, the dollar amount or percentage of revenue gain enabled by this rate analysis. Related to payback period.
Snow Bird	A customer, usually residential, that goes away during part of the year. Most commonly, these are people of "means" who live in the north who "fly south" for the winter. But, this category includes everyone who is absent for a significant part of the year but returns to their permanent residence.
Stormwater	Precipitation that falls on and then leaves a site, flows elsewhere, potentially causing or adding to flooding and often carries with it sediment and pollutants.
Stormwater Management	The practice of reducing and mitigating off-site stormwater flows and impacts.
System Development Charge, or Fee	Fee assessed to pay for at least part of the cost to build system capacity. For purposes of this model, all charges related to connecting new customers will be "rolled together" into a system development charge, usually including a charge that buys a new customer system capacity. This combined charge may be a few hundred dollars for a residential customer, if little or no capacity costs are included. If capacity costs are included, it could be many thousands of dollars for a large industrial customer. Similar terms in common use include "tap-on fee," "connection fee or charge," "hook-up fee," "impact fee," "availability charge," and "capacity charge."
Test Year	The one year period from which data was gathered to be the basis of the rate analysis, the starting place, which is usually the last completed fiscal year. See related "analysis year."
Unit Charge	This rate, charge or fee goes by other names, too. It is the rate paid for water, sewer or other commodity per unit of measurement, like per 1,000 gallons or per 100 cubic feet. Generally, this charge should recover variable costs.
Usage Allowance	The volume, if any, that is "given away" with the minimum charge. Most systems give away no volume. Those that give away an unlimited volume have what are called "flat rates" - a minimum charge only.
User Fee, User Charge, User Rates	Fees assessed to customers for use of the system. This does not include system development charges, late payment penalties or other types of charges.
Variable Cost	Accounting and rate setting agree on this definition. For rate setting, a variable cost is one that rises and falls as the customer uses the commodity. The simplest example is electricity used to treat and move water around. While the power company assesses a minimum charge and demand charges to the water or other utility that is "signed up" for electric service, the majority of the electric bill rises and falls with the volume of water produced by that utility. Therefore, variable costs should be recovered with unit charges.
Water Loss and Unbilled-for Water	Measured by volume or percent, the part of a water system's net water production that does not reach customers or is not billed to customers. This loss also includes billable volume lost due to under-registering customer meters. "Unbilled-for water" includes water loss, but it also includes water actually given away at no charge.
Working Capital, Net Income	The amount left in the operating fund after paying all costs due during that month, year or other time period.
Working Capital Goal or Operating Reserves Goal	The desired operating fund reserve, in dollars or percent, at a stated point in time. Small systems (1,000 connections) generally should target 35 percent or greater. Larger systems can target a lower percentage. The goal for each system should be based upon the needs of that system and the risk the customers are willing to take.

Table and Chart Descriptions

The tables and charts of this model tell a story about the rates and finances of the utility.

The tables you first see in this model depict utility data, like the rates that were being assessed to customers during the test year, the volume of service those customers used, how much income the utility collected, what its costs were, and more. This data came from utility records. In addition, the tables in this model go beyond the utility's historical data and include projections of incomes that will be generated by the new rates, future expenses as they grow with inflation and other forward-looking features.

Tables in the middle part of the model primarily calculate new rates and fees that will generate enough revenue to pay the utility's costs over time.

The tables in the last part of the model show the results of new rates and fees. Those include the rates themselves, surcharges to rates, if appropriate, the affordability of the new rates, and reserves generated by the new rates. Many of these results as shown graphically in charts at the end of the model.

As you progress through the model, keep this story in mind. You probably understand much the math performed by the model. There is some you likely do not recognize, and that is OK. Just know that new, adequate rates were calculated based upon the utility's historical data, projected into the future.

A final note: When a numbered table or chart listed below is not in the package, that was not a mistake. It simply means that table or chart from our master program was not needed in this situation, so it was bypassed and left out.

Now, here are descriptions of the tables and charts.

Name	What Each is or Does
Definitions (List)	The meaning of terms used in this report and in rate setting generally
Return on Investment (Calculation)	A summary of financial outcomes enabled by the proposed rates
Table 1 - Rates	User rates in effect at the end of the test year. Unless rates were recently changed, these are the current rates.
Table 2 - Test Year Usage	Compilation of actual volume of service used by customers during the test year
Table 3 - Basic User Data and Operating Incomes	Basic user statistics and operating revenues, projected for 10 years, based on the assumption the modeled rates and future inflationary increases will ber adopted
Table 4 - Operating Costs and Net Income	Operating costs projected for 10 years
Table 5 - Capital Improvements Program (CIP)	Capital improvements and how they will be paid over next 10 years, including debt service
Table 6 - Equipment Replacement Schedule - Detailed	If applicable, detailed schedule of equipment replacements for next 20 years
Table 7 - Equipment Replacement Annuity Calculation	If applicable, calculation of the annual annuity (yearly savings amount) needed to pay for all equipment replacements as they come due and ending with the desired balance
Table 8 - Average Cost Classification	Sumation of a target year's costs and calculation of the "cost-of-service" rate structure basis for recovery of fixed costs and variable costs. Unless directed to do otherwise, this analysis developed cost-to-serve rates based on cost classification in this table.
Table 9 - Marginal Cost Classification	If applicable, calculation of costs incurred to serve a specified type of customer
Table 10 - Initial Rate Adjustments and Resulting Revenues	These are the modeled user rates and the resulting "blended" revenues they, and the current rates, will generate during the rate adjustment year
Table 11 - AWWA Safe Operating Flow by Meter Size	If applicable, this table calculates the meter equivalent ratio, which is used for calculating peak flow capacity-based system development fees, surcharges and revenues in Tables 13 through 16 for water meters, and when applicable, capacity costs for fire sprinklers.

Table 12 - Flow Capacity Costs	If applicable, calculation of the various costs to build base and peak flow capacity to serve customers, when such fees will be based on water meter size
Table 13 - System Development Fees	If applicable, calculation of meter size-based system development fees needed to recover costs calculated in Table 11, when such fees will be based on water meter size.
Table 14 - Revenues From System Development Fees	If applicable, calculation of total fee revenues that would be generated during one full year at the fees in Table 13.
Table 15 - Minimum Charge Fees, Including Capacity Surcharges	If applicable, calculation of meter size-based capacity surcharges and minimum charges to recover costs calculated in Table 11, when such fees will be based on water meter size
Table 16 - Revenues From Minimum Charge Surcharges	If applicable, calculation of total fee revenues that would be generated during one full year at the fees in Table 15.
Table 17 - Financial Capacity Indicators and Reserves	Shows the financial effects of the modeled rates, costs, etc. on the utility and on the benchmark 5,000 gallon per month residential water or sewer customer, as appropriate
Table 18 - Bills Before and After Rate Adjustments	Bills at the modeled rates are compared to those under the current rates. Note: the modeled bills do not include capacity surcharges to the minimum charges unless they are included in the minimum charges column of Table 10.
Table 19 - User Statistics	If included, this table shows volumes and percentages of use, revenue generated and other statistics
Chart 1 - Operating Ratio	*Graph of operating ratio for 10 years as a result of the modeled rates and the current rates*
Chart 2 - Coverage Ratio	*Graph of coverage ratios for 10 years of the modeled rates and the current rates*
Chart 3 - 5,000 Gallon Residential User's Bill	*Graph of the bill for the benchmark 5,000 gallon per month residential user, with smallest available meter size (used in grant and loan eligibility determinations) as a result of the modeled rates, and the current rates*
Chart 4 - Affordability Index	*Graph of the affordability index for 10 years of the benchmark residential user's bill (used in grant and loan eligibility determinations)*
Chart 5 - Working Capital vs Goal	*Graph for 10 years of total (unobligated) cash assets at modeled rates compared to the goal for total cash assets*
Chart 6 - Value of Cash Assets Before Inflation	*Graph for 10 years of unobligated cash assets NOT adjusted for inflation at modeled rates and current rates*
Chart 7 - Value of Cash Assets After Inflation	*Graph for 10 years of unobligated cash assets adjusted for inflation at modeled rates and current rates. This is the real buying power of cash reserves.*
Chart 8 - Sum of All Reserves	*Graph of all reserves of all kinds at the modeled rates and at the current rates*

Table 1 - Rates

Butler County, KS RWD #5, Water Rates Model 2023-4

Unless rates were recently changed, these are the current rates. When a volume range was left out of the table, in order to make it shorter, the unit charge that shows for the next lowest volume range also applies to the hidden volume range.

Rates in Effect at End of Test Year, or Now

Customer Type, Rate Class or Meter Size	Volume Range Bottom (in Gallons)	Billing Cycle Minimum Charge	Usage Allowance in 1,000s	Unit Charge per 1,000 Gallons
5/8, 3/4 Inch Meters	0	$30.00	0.000	$8.50
	4,113	$30.00	0.000	$8.50
1 Inch Meter	0	$30.00	0.000	$8.50
	4,113	$30.00	0.000	$8.50
1.5 Inch Meter	0	$40.00	0.000	$8.50
	4,113	$40.00	0.000	$8.50
2 Inch Meter	0	$40.00	0.000	$8.50
	4,113	$40.00	0.000	$8.50
3 Inch Meter	0	$92.00	0.000	$8.50
	4,113	$92.00	0.000	$8.50
4 Inch Meter (Towanda)	0	$150.00	0.000	$5.74
	3,151,608	$150.00	0.000	$5.74
6 Inch Meter	0	$295.00	0.000	$8.50
	4,113	$295.00	0.000	$8.50
Contract Water	0	$100.00	0.000	$10.50
	800,000	$100.00	0.000	$10.50

Table 2 - Test Year Usage

Butler County, KS RWD #5, Water Rates Model 2023-4

This table shows usage by all customers during the test year. The Towanda volume is known, so the average monthly Towanda use is shown here. Likewise, the total use by all other customers is known, so the average use per customer is shown for all such customers.

Residential meter readings per year: 12

Test year = the one-year period being analyzed starts: 1/1/2022

Other customer readings per year: 12

Date this model created: 2/2/2023

Bills per year: 12

Customer, Rate Class or Meter Size	Volume Range Bottom (in Gallons)	Volume Range Top (in Gallons)	Use in Each Range in Gallons	# of Customers That "Maxed Out" in Each Range	% of Customers That "Maxed Out" in Each Range	% of Total Use in Each Range
5/8, 3/4 Inch Meters	0	999	23,112,000	0	0.0%	0.0%
	1,000	1,999	23,112,000	0	0.0%	0.0%
	2,000	2,999	23,112,000	0	0.0%	0.0%
	3,000	4,112	25,719,636	0	0.0%	0.0%
	4,113	4,999	0	1,926	87.6%	65.0%
			95,055,636	1,926	87.6%	65.0%
1 Inch Meter	0	999	3,000,000	0	0.0%	0.0%
	1,000	1,999	3,000,000	0	0.0%	0.0%
	2,000	2,999	3,000,000	0	0.0%	0.0%
	3,000	4,112	3,338,478	0	0.0%	0.0%
	4,113	4,999	0	250	11.4%	8.4%
			12,338,478	250	11.4%	8.4%
1.5 Inch Meter	0	999	48,000	0	0.0%	0.0%
	1,000	1,999	48,000	0	0.0%	0.0%
	2,000	2,999	48,000	0	0.0%	0.0%
	3,000	4,112	53,416	0	0.0%	0.0%
	4,113	4,999	0	4	0.2%	0.1%
			197,416	4	0.2%	0.1%
2 Inch Meter	0	999	156,000	0	0.0%	0.0%
	1,000	1,999	156,000	0	0.0%	0.0%
	2,000	2,999	156,000	0	0.0%	0.0%
	3,000	4,112	173,601	0	0.0%	0.0%
	4,113	4,999	0	13	0.6%	0.4%
			641,601	13	0.6%	0.4%
3 Inch Meter	0	999	12,000	0	0.0%	0.0%
	1,000	1,999	12,000	0	0.0%	0.0%
	2,000	2,999	12,000	0	0.0%	0.0%
	3,000	4,112	13,354	0	0.0%	0.0%
	4,113	4,999	0	1	0.0%	0.0%
			49,354	1	0.0%	0.0%

Table 2 - Test Year Usage

Customer, Rate Class or Meter Size	Volume Range Bottom (in Gallons)	Volume Range Top (in Gallons)	Use in Each Range in Gallons	# of Customers That "Maxed Out" in Each Range	% of Customers That "Maxed Out" in Each Range	% of Total Use in Each Range
4 Inch Meter (Towanda)	0	999	12,000	0	0.0%	0.0%
	1,000	1,999	12,000	0	0.0%	0.0%
	2,000	2,999	12,000	0	0.0%	0.0%
	3,000	4,112	13,354	0	0.0%	0.0%
	4,113	4,999	10,646	0	0.0%	0.0%
	5,000	5,999	12,000	0	0.0%	0.0%
	6,000	6,999	12,000	0	0.0%	0.0%
	7,000	7,999	12,000	0	0.0%	0.0%
	8,000	8,999	12,000	0	0.0%	0.0%
	9,000	9,999	12,000	0	0.0%	0.0%
	10,000	19,999	120,000	0	0.0%	0.0%
	20,000	29,999	120,000	0	0.0%	0.0%
	30,000	39,999	120,000	0	0.0%	0.0%
	40,000	49,999	120,000	0	0.0%	0.0%
	50,000	59,999	120,000	0	0.0%	0.0%
	60,000	69,999	120,000	0	0.0%	0.0%
	70,000	79,999	120,000	0	0.0%	0.0%
	80,000	89,999	120,000	0	0.0%	0.0%
	90,000	99,999	120,000	0	0.0%	0.0%
	100,000	199,999	1,200,000	0	0.0%	0.0%
	200,000	299,999	1,200,000	0	0.0%	0.0%
	300,000	399,999	1,200,000	0	0.0%	0.0%
	400,000	499,999	1,200,000	0	0.0%	0.0%
	500,000	599,999	1,200,000	0	0.0%	0.0%
	600,000	699,999	1,200,000	0	0.0%	0.0%
	700,000	3,151,607	29,419,300	0	0.0%	0.0%
	3,151,608	3,151,608	0	1	0.0%	25.9%
			37,819,300	1	0.0%	25.9%
6 Inch Meter	0	999	48,000	0	0.0%	0.0%
	1,000	1,999	48,000	0	0.0%	0.0%
	2,000	2,999	48,000	0	0.0%	0.0%
	3,000	4,112	53,416	0	0.0%	0.0%
	4,113	4,999	0	4	0.2%	0.1%
			197,416	4	0.2%	0.1%
Contract Water	0	999	0	0	0.0%	0.0%
	1,000	1,999	0	0	0.0%	0.0%
	2,000	2,999	0	0	0.0%	0.0%
	3,000	4,112	0	0	0.0%	0.0%
	4,113	4,999	0	0	0.0%	0.0%
			0	0	0.0%	0.0%
		Grand Totals:	146,299,200	2,199	100%	100%

Table 3 - Operating Incomes and Basic User Data
Butler County, KS RWD #5, Water Rates Model 2023-4

This table depicts user statistics, customer growth, and system incomes and across the board "inflationary" style rate increases through the 10th year.

Annual Median Household Income (AMHI)

$61,951	Census Bureau estimate of AMHI for the year 2019
$45,474	Census Bureau estimate of AMHI for the year 1999
$16,477	AMHI growth during this time period
1.81%	Simple annual income growth rate during this time period (used to project future household incomes)

Test Year Growth of Customer Base and Average Tap Fee Paid per Connection

55	Number new Water connections made during test year
$3,602	Average Water tap or installation fee assessed during the test year

This model is programmed for rates to be reset in the "Analysis Year," also called the "0 Year" column below (heading highlighted blue). Revenues will be collected at the now-current rates for the first part of the analysis year and the modeled rates for the last part of the analysis year. Thus, the revenues shown that column of the table are "blended" revenues; part collected at the old rates and part collected at the new rates. It was then assumed that all rate adjustments made after the initial (major) adjustment will be done annually on approximately the anniversary of the first adjustment. If rates will not be adjusted during the "0 Year," an adjustment (normally a revenue reduction) was calculated below to account for the late start in making the first adjustments.

Basic User (Customer) Data

(First year balances and incomes are actual, subsequent years are projected.)

	Inflation/ Deflation (–) Factor	Test Year Starting 1/1/22	Analysis Year 0 Year Starting 1/1/23	Years Following the Analysis Year (for Which Results Have Been Projected) 1st Year Starting 1/1/24	2nd Year Starting 1/1/25	3rd Year Starting 1/1/26	4th Year Starting 1/1/27	5th Year Starting 1/1/28	6th Year Starting 1/1/29	7th Year Starting 1/1/30	8th Year Starting 1/1/31	9th Year Starting 1/1/32	10th Year Starting 1/1/33
Rate Increases Projected for Future Years	N.A.	N.A.	N.A.	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
				The row above shows the rate at which user charge fees should be increased for each year beyond the initial rate adjustment year. Unless stated otherwise, these should be across-the-board increases to all rates and fees and that should continue until a new rate analysis is done.									
Average Number of Customers	N.A.	2,199	2,254	2,299	2,344	2,389	2,434	2,479	2,524	2,569	2,614	2,659	2,704
Customers Added or Lost (-) Each Year	N.A.	55.0	55.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Customer Growth or Loss (-) Rate	N.A.	2.50%	2.44%	1.96%	1.92%	1.88%	1.85%	1.82%	1.78%	1.75%	1.72%	1.69%	1.66%
Test Year (Actual) and Projected Future Years' Sales, in Gallons	N.A.	146,299,200	149,958,343	152,952,188	155,946,032	158,939,877	161,933,721	164,927,566	167,921,410	170,915,255	173,909,099	176,902,944	179,896,788
Calculated User Charge Fees, Accounting for New Customers and Future Rate Increases Over the Years													
Actual or Calculated Sales Revenues		$1,914,895	$2,022,692	$2,196,313	$2,328,875	$2,468,528	$2,615,628	$2,770,545	$2,933,671	$3,105,414	$3,286,202	$3,476,485	$3,676,733
Additional Sales Revenues From New Customers			$24,881	$42,990	$44,710	$46,498	$48,358	$50,292	$52,304	$54,396	$56,572	$58,835	$61,188
Total Calculated Revenues (User Charge Fees)		$1,914,895	$2,047,572	$2,239,303	$2,373,585	$2,515,026	$2,663,985	$2,820,837	$2,985,975	$3,159,810	$3,342,774	$3,535,320	$3,737,921
Operating Incomes													
User Charge Fees (Tables 10, 12, 12B, 15, 15B, 16, 16B, as applicable)	N.A.	$2,215,294	$2,047,572	$2,239,303	$2,373,585	$2,515,026	$2,663,985	$2,820,837	$2,985,975	$3,159,810	$3,342,774	$3,535,320	$3,737,921
Late Payment Charge	N.A.	$21,726	$22,257	$22,692	$23,128	$23,563	$23,999	$24,435	$24,870	$25,306	$25,742	$26,177	$26,613
New Memberships (Current Rate Structure)	% Above	$198,083	$98,227	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Adjusted Meter Size-based System Development Fees (Tables 13, 14, if applicable)	% Above	$0	$116,922	$197,357	$205,251	$213,461	$222,000	$230,880	$240,115	$249,720	$259,708	$270,097	$280,901
Interest Income	N.A.	$7,228	$8,413	$8,925	$9,635	$10,028	$10,476	$11,164	$11,382	$11,872	$12,355	$12,902	$13,553
Transfer fees	N.A.	$11,000	$11,000	$11,000	$11,000	$11,000	$11,000	$11,000	$11,000	$11,000	$11,000	$11,000	$11,000
Other income	N.A.	$66,929	$68,563	$69,905	$71,247	$72,589	$73,931	$75,273	$76,615	$77,957	$79,299	$80,641	$81,983
Aid in construction	N.A.	$312,537	$318,257	$322,929	$327,578	$332,206	$336,813	$341,398	$345,963	$350,508	$355,034	$359,540	$364,028
Revenue Loss (-) Due to Conservation	5.0%	$0	$0	-$6,771	-$4,742	-$4,995	-$5,261	-$5,540	-$5,832	-$6,139	-$6,462	-$6,800	-$7,155
Total Operating Incomes		**$2,832,797**	**$2,691,210**	**$2,865,340**	**$3,016,681**	**$3,172,879**	**$3,336,943**	**$3,509,447**	**$3,690,088**	**$3,880,033**	**$4,079,450**	**$4,288,876**	**$4,508,842**

Table 4 - Operating Costs and Net Income

Butler County, KS RWD #5, Water Rates Model 2023-4

This table depicts expenses during the test year, this year and for the next 10 years. Some future costs will experience inflation. Those costs that go up as use goes up are increased by the cost inflation factor plus the growth rate in users.

(First year costs and net incomes are actual, subsequent years are projected.)

Expense Items	Inflation/ Deflation (–) Factor	Test Year Starting 1/1/22	Analysis Year 0 Year Starting 1/1/23	Years Following the Analysis Year (for Which Results Have Been Projected) 1st Year Starting 1/1/24	2nd Year Starting 1/1/25	3rd Year Starting 1/1/26	4th Year Starting 1/1/27	5th Year Starting 1/1/28	6th Year Starting 1/1/29	7th Year Starting 1/1/30	8th Year Starting 1/1/31	9th Year Starting 1/1/32	10th Year Starting 1/1/33
Salaries and wages	4.0%	$330,046	$343,247	$356,977	$371,256	$386,107	$401,551	$417,613	$434,317	$451,690	$469,758	$488,548	$508,090
Payroll taxes	4.0%	$24,021	$24,982	$25,981	$27,021	$28,101	$29,225	$30,394	$31,610	$32,875	$34,190	$35,557	$36,980
Employer medical insurance	4.0%	$47,614	$49,518	$51,499	$53,559	$55,701	$57,929	$60,247	$62,656	$65,163	$67,769	$70,480	$73,299
Uniforms	4.0%	$165	$172	$178	$186	$193	$201	$209	$217	$226	$235	$244	$254
Maintenance	4.0%	$165,644	$172,270	$179,160	$186,327	$193,780	$201,531	$209,592	$217,976	$226,695	$235,763	$245,193	$255,001
Vehicle fuel	4.0%	$26,079	$27,122	$28,207	$29,335	$30,509	$31,729	$32,998	$34,318	$35,691	$37,119	$38,603	$40,148
Vehicle maintenance	4.0%	$35,306	$36,718	$38,186	$39,714	$41,302	$42,955	$44,673	$46,460	$48,318	$50,251	$52,261	$54,351
Radio repair (Meter Pits)	4.0%	$0	$0	$0	$0	$0	$80,000	$0	$0	$0	$0	$0	$0
Repair	4.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Engineering Fees	5.0%	$27,769	$29,158	$40,000	$42,000	$44,100	$46,305	$48,620	$51,051	$53,604	$56,284	$59,098	$62,053
Miscellaneous operating expenses	4.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Utilities	6.0%	$57,812	$62,775	$67,844	$73,296	$79,157	$85,458	$92,229	$99,506	$107,324	$115,722	$124,741	$134,426
Telephone	4.0%	$16,907	$17,583	$18,286	$19,018	$19,779	$20,570	$21,392	$22,248	$23,138	$24,064	$25,026	$26,027
Accounting services	5.0%	$39,930	$32,600	$40,000	$42,000	$44,100	$46,305	$48,620	$51,051	$53,604	$56,284	$59,098	$62,053
Office supplies	4.0%	$44,230	$45,999	$47,839	$49,752	$51,742	$53,812	$55,964	$58,203	$60,531	$62,952	$65,471	$68,089
Office and general administrative expenses	4.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Computer supplies	4.0%	$0	$0	$0	$0	$0	$0	$10,000	$0	$0	$0	$10,000	$0
Printing costs	4.0%	$0	$5,000	$5,200	$5,408	$5,624	$5,849	$6,083	$6,327	$6,580	$6,843	$7,117	$7,401
On-line payment monthly charge	4.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dues and subscriptions	5.0%	$2,764	$5,000	$5,250	$5,513	$5,788	$6,078	$6,381	$6,700	$7,036	$7,387	$7,757	$8,144
Donations	4.0%	$100	$104	$108	$112	$117	$122	$127	$132	$137	$142	$148	$154
Convention and travel	4.0%	$87	$90	$94	$98	$102	$106	$110	$114	$119	$124	$129	$134
Computer annual software fees	4.0%	$27,023	$28,104	$29,228	$30,397	$31,613	$32,877	$34,192	$35,560	$36,982	$38,462	$40,000	$41,600
Postage and freight	4.0%	$3,200	$4,500	$4,772	$5,058	$5,359	$5,677	$6,011	$6,363	$6,733	$7,123	$7,533	$7,965
Insurance expense	4.0%	$59,083	$61,447	$63,904	$66,461	$69,119	$71,884	$74,759	$77,749	$80,859	$84,094	$87,458	$90,956
Legal fees	4.0%	$8,340	$8,674	$9,021	$9,381	$9,757	$10,147	$10,553	$10,975	$11,414	$11,870	$12,345	$12,839
Accounting fees	4.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Real estate taxes	4.0%	$7	$7	$8	$8	$8	$9	$9	$9	$10	$10	$11	$11
Andover franchise fee	4.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Miscellaneous expenses	4.0%	$3,125	$3,250	$3,380	$3,515	$3,656	$3,802	$3,954	$4,112	$4,277	$4,448	$4,626	$4,811
Engineering	4.0%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Furniture and equipment	4.0%	$0	$10,000	$10,400	$10,816	$11,249	$11,699	$12,167	$12,653	$13,159	$13,686	$14,233	$14,802
Depreciation expense	0.0%	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491
Interest expense	4.0%	$6,101	$6,345	$6,599	$6,863	$7,137	$7,423	$7,719	$8,028	$8,349	$8,683	$9,031	$9,392
Wichita Project interest expense	4.0%	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5
Water purchased - El Dorado	5.0%	$338,683	$364,295	$389,997	$417,358	$446,481	$477,472	$510,446	$545,524	$582,834	$622,511	$664,698	$709,548
Water purchased - Wichita	5.0%	$437,661	$470,757	$503,970	$539,328	$576,961	$617,009	$659,620	$704,949	$753,163	$804,435	$858,951	$916,908
Clean drinking water fee	4.0%	$8,778	$9,129	$9,494	$9,874	$10,268	$10,679	$11,106	$11,551	$12,013	$12,493	$12,993	$13,513

Table 4 - Operating Costs and Net Income

Expense Items	Inflation/ Deflation (–) Factor	Test Year Starting 1/1/22	0 Year Starting 1/1/23	1st Year Starting 1/1/24	2nd Year Starting 1/1/25	3rd Year Starting 1/1/26	4th Year Starting 1/1/27	5th Year Starting 1/1/28	6th Year Starting 1/1/29	7th Year Starting 1/1/30	8th Year Starting 1/1/31	9th Year Starting 1/1/32	10th Year Starting 1/1/33
Set meters and water line	4.0%	$58,010	$61,803	$65,533	$69,462	$73,602	$77,961	$82,551	$87,384	$92,471	$97,826	$103,460	$109,389
Telemetry and reports	4.0%	$11,759	$12,229	$12,719	$13,227	$13,756	$14,307	$14,879	$15,474	$16,093	$16,737	$17,406	$18,102
One-time Reduction of R&R Annuity	0.0%	-$115,414	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual Payment to R&R Reserve (Table 7)	0.0%	$115,414	$115,414	$115,414	$115,414	$115,414	$115,414	$115,414	$115,414	$115,414	$115,414	$115,414	$115,414
User Charge Analysis Services	5.0%	$0	$8,237	$0	$0	$9,082	$0	$0	$10,012	$0	$0	$11,039	$0
Total CIP-related Payouts	N.A.	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5	Table 5
Total Operating Costs		**$2,403,733**	**$2,640,019**	**$2,752,740**	**$2,865,247**	**$2,993,155**	**$3,189,575**	**$3,252,126**	**$3,392,138**	**$3,529,992**	**$3,686,168**	**$3,872,161**	**$4,025,347**
Net Income (or Loss)		$429,064	$51,191	$112,600	$151,434	$179,724	$147,368	$257,320	$297,950	$350,041	$393,282	$416,716	$483,495
Working Capital Goal: 35% In Dollars, That is:		$841,306	$924,007	$963,459	$1,002,836	$1,047,604	$1,116,351	$1,138,244	$1,187,248	$1,235,497	$1,290,159	$1,355,256	$1,408,872

Notes: Most costs will increase in the future by a four percent inflation rate. Some (highlighted gold), especially the cost of purchasing water, will increase as the sellers' rates increase and as the district connects new customers who will increase water purchase needs.

Table 5 - Capital Improvement Program (CIP)

Butler County, KS RWD #5, Water Rates Model 2023-4

This table depicts capital improvements and their funding. Costs reflect inflation.

	Test Year	Analysis Year	Years Following the Analysis Year (for Which Improvement Projects, Costs, Funding, etc. Have Been Projected)									
	Starting	0 Year Starting	1st Year Starting	2nd Year Starting	3rd Year Starting	4th Year Starting	5th Year Starting	6th Year Starting	7th Year Starting	8th Year Starting	9th Year Starting	10th Year Starting
	1/1/22	1/1/23	1/1/24	1/1/25	1/1/26	1/1/27	1/1/28	1/1/29	1/1/30	1/1/31	1/1/32	1/1/33
Planned Spending, Debt-paid Portion of Projects (CIP costs to be funded with loans are shown in this section.)												
As detailed in the document, "RWD #5, 5 Year Planning," the system will need numerous improvements and will share in the cost of improvements to the Eldorado line, and perhaps Wichita facilities, as well. Only the annual total amounts, as inflated in future years, are shown here. The District's plan covers five years. This table assumes the pattern of the first five years will repeat in the second five years.	$0	$1,827,900	$2,231,289	$1,823,687	$1,718,095	$1,860,804	$2,119,037	$2,586,675	$2,114,153	$1,991,743	$2,157,182	$2,456,545
New Water Tower	$0	$0	$0	$2,673,468	$0	$0	$0	$0	$0	$0	$0	$0
Loan Closing Costs, Estimated at: 2.5%	$0	$45,698	$55,782	$112,429	$42,952	$46,520	$52,976	$64,667	$52,854	$49,794	$53,930	$61,414
Total Debt-paid Portion of Projects	$0	$1,873,598	$2,287,071	$4,609,584	$1,761,047	$1,907,324	$2,172,013	$2,651,342	$2,167,007	$2,041,536	$2,211,111	$2,517,958
Planned Spending, Grant-paid Portion of Projects (CIP costs to be grant-funded are shown here.)												
Total Grant-paid Portion of Projects	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Planned Spending, Cash-paid Portion of Projects (CIP costs to be funded from reserves are shown here.)												
Grant Acquisition Costs, Estimated at: 2.5%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Cash-paid Portion of Projects	$0	$203,100	$247,921	$499,684	$190,899	$206,756	$235,449	$287,408	$234,906	$221,305	$239,687	$272,949
Total CIP Costs	**$0**	**$2,076,698**	**$2,534,992**	**$5,109,268**	**$1,951,946**	**$2,114,080**	**$2,407,462**	**$2,938,751**	**$2,401,913**	**$2,262,841**	**$2,450,798**	**$2,790,908**
Debt Repayment												
Existing Debt Payments (Following is debt that was initiated during the test year or earlier.)												
Wichita Source Project, USDA RD	$293,652	$293,652	$293,652	$293,652	$271,260	$271,260	$271,260	$271,260	$271,260	$271,260	$271,260	$271,260
State Revolving Fund Loan, 2014	$128,844	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Debt Payments (Following are payments for projects to be paid with new debt. It is assumed these will be loan/lease-financed for a term of: 40 years at a 3.0% interest rate.)												
Loan Originated in Analysis (This) Year			$81,056	$81,056	$81,056	$81,056	$81,056	$81,056	$81,056	$81,056	$81,056	$81,056
Loan Originated in 1st Year				$98,944	$98,944	$98,944	$98,944	$98,944	$98,944	$98,944	$98,944	$98,944
Loan Originated in 2nd Year					$199,422	$199,422	$199,422	$199,422	$199,422	$199,422	$199,422	$199,422
Loan Originated in 3rd Year						$76,187	$76,187	$76,187	$76,187	$76,187	$76,187	$76,187
Loan Originated in 4th Year							$82,515	$82,515	$82,515	$82,515	$82,515	$82,515
Loan Originated in 5th Year								$93,966	$93,966	$93,966	$93,966	$93,966
Loan Originated in 6th Year									$114,703	$114,703	$114,703	$114,703
Loan Originated in 7th Year										$93,750	$93,750	$93,750
Loan Originated in 8th Year											$88,322	$88,322
Loan Originated in 9th Year												$95,658
Total Debt Payments	$422,496	$293,652	$374,708	$473,652	$650,682	$726,869	$809,384	$903,351	$1,018,054	$1,111,804	$1,200,126	$1,295,784
Total CIP-related Payouts	**$422,496**	**$2,370,350**	**$2,909,701**	**$5,582,920**	**$2,602,628**	**$2,840,949**	**$3,216,846**	**$3,842,102**	**$3,419,967**	**$3,374,645**	**$3,650,924**	**$4,086,692**
(This is the total cash required for this CIP and debt payment schedule. These amounts must come from utility income, reserves or outside sources, as shown in the next section.)												

Table 5 - Capital Improvement Program (CIP)

This table depicts capital improvements and their funding. Costs reflect inflation.

	Test Year Starting	Analysis Year: 0 Year Starting	1st Year Starting	2nd Year Starting	3rd Year Starting	4th Year Starting	5th Year Starting	6th Year Starting	7th Year Starting	8th Year Starting	9th Year Starting	10th Year Starting
	1/1/22	1/1/23	1/1/24	1/1/25	1/1/26	1/1/27	1/1/28	1/1/29	1/1/30	1/1/31	1/1/32	1/1/33
CIP Fund Sources (Following are the sources and amounts of funds expected to pay for the above CIP schedule.)												
Cash Reserves (Internal Funds)												
Debt and CIP Reserves Starting Balance	$1,941,436	$2,732,924	$2,914,322	$3,015,108	$2,837,622	$2,811,241	$2,635,953	$2,502,757	$2,234,490	$1,951,504	$1,619,536	$1,187,223
Working Capital Transferred in	$590,493	$0	$41,638	$112,057	$134,957	$78,622	$235,427	$248,946	$301,792	$338,620	$351,618	$429,880
Debt and CIP Reserves Interest Earned (or Paid)	$0	$54,658	$58,286	$60,302	$56,752	$56,225	$52,719	$50,055	$44,690	$39,030	$32,391	$23,744
Depreciation Transferred In	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491	$623,491
Total Available Internal Funds	$3,155,420	$3,411,074	$3,637,737	$3,810,958	$3,652,822	$3,569,578	$3,547,590	$3,425,250	$3,204,464	$2,952,645	$2,627,036	$2,264,339
Grant and Loan Proceeds (External Funds)												
Loan Originated in Analysis (This) Year		$1,873,598	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Loan Originated in 1st Year			$2,287,071	$0	$0	$0	$0	$0	$0	$0	$0	$0
Loan Originated in 2nd Year				$4,609,584	$0	$0	$0	$0	$0	$0	$0	$0
Loan Originated in 3rd Year					$1,761,047	$0	$0	$0	$0	$0	$0	$0
Loan Originated in 4th Year						$1,907,324	$0	$0	$0	$0	$0	$0
Loan Originated in 5th Year							$2,172,013	$0	$0	$0	$0	$0
Loan Originated in 6th Year								$2,651,342	$0	$0	$0	$0
Loan Originated in 7th Year									$2,167,007	$0	$0	$0
Loan Originated in 8th Year										$2,041,536	$0	$0
Loan Originated in 9th Year											$2,211,111	$0
Loan Originated in 10th Year												$2,517,958
Total Available External Funds	$0	$1,873,598	$2,287,071	$4,609,584	$1,761,047	$1,907,324	$2,172,013	$2,651,342	$2,167,007	$2,041,536	$2,211,111	$2,517,958
Total Available Funds	**$3,155,420**	**$5,284,671**	**$5,924,809**	**$8,420,542**	**$5,413,869**	**$5,476,902**	**$5,719,603**	**$6,076,592**	**$5,371,471**	**$4,994,181**	**$4,838,147**	**$4,782,297**
Outcomes (This CIP spending and funding plan will result in the following cash needs and ending balances each year.)												
Total Available Funds	**$3,155,420**	**$5,284,671**	**$5,924,809**	**$8,420,542**	**$5,413,869**	**$5,476,902**	**$5,719,603**	**$6,076,592**	**$5,371,471**	**$4,994,181**	**$4,838,147**	**$4,782,297**
Total CIP-related Payouts	**$422,496**	**$2,370,350**	**$2,909,701**	**$5,582,920**	**$2,602,628**	**$2,840,949**	**$3,216,846**	**$3,842,102**	**$3,419,967**	**$3,374,645**	**$3,650,924**	**$4,086,692**
Debt and CIP Reserves Ending Balances	**$2,732,924**	**$2,914,322**	**$3,015,108**	**$2,837,622**	**$2,811,241**	**$2,635,953**	**$2,502,757**	**$2,234,490**	**$1,951,504**	**$1,619,536**	**$1,187,223**	**$695,605**

Notes: The district is growing rapidly, therefore, it needs substantial system improvements to accommodate that growth. I assumed the district will fund improvements with debt through USDA Rural Development as it has in the past. Debt payments will become a substantial part of the utility's overall costs in the future, rising by about $1 million by the tenth year.

Table 6 - Equipment Replacement Schedule - Detailed

Butler County, KS RWD #5, Water Rates Model 2023-4

Year Beginning	Annual Average R&R Needs								Total Annual Replacement Costs
1/1/22	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/23	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/24	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/25	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/26	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/27	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/28	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/29	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/30	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/31	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/32	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/33	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/34	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/35	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/36	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/37	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/38	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/39	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/40	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/41	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/42	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/43	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/44	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/45	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000
1/1/46	$75,000	$0	$0	$0	$0	$0	$0	$0	$75,000

Table 7 - Equipment Replacement Annuity Calculation
Butler County, KS RWD #5, Water Rates Model 2023-4

This table calculates the annual annuity (savings deposit) needed to build replacement (R&R) reserves. This annuity amount should actually be deposited in a savings account. The annuity amount, called the "Required Annual Deposit (Annuity) to Replacement Account" below, should be included in the utility's general budget as a cost. As a result, all replacement and refurbishment scheduled in Table 6, the detailed replacement schedule, would be paid for out of R&R reserves and not out of the utility's general budget.

In simple terms, the annuity at the bottom of this table should be deposited into an account each year and R&R projects should be paid for out of that account.

3.00%	Average Inflation Rate for the Following Water System Equipment for the Term of This Replacement Schedule
2.00%	Average Interest Rate on Balances Invested for the Term of This Replacement Schedule
2.00%	Average Interest Rate on Amounts Borrowed for the Term of This Replacement Schedule

Year Beginning	Schedule Year	This Year's Costs in Current Dollars	Future Annual Inflated Net Costs	Interest Earned on Prior Balance	End of Year Balance in Future Dollars	Minimum Desired End of Year Balance in Future Dollars
1/1/22	Analysis Year	$75,000	$75,000	$0	-$75,000	$142,500
1/1/23	1st Year	$75,000	$77,250	-$1,500	-$38,336	$146,775
1/1/24	2nd Year	$75,000	$79,568	-$767	-$3,256	$151,178
1/1/25	3rd Year	$75,000	$81,955	-$65	$30,138	$155,714
1/1/26	4th Year	$75,000	$84,413	$603	$61,742	$160,385
1/1/27	5th Year	$75,000	$86,946	$1,235	$91,445	$165,197
1/1/28	6th Year	$75,000	$89,554	$1,829	$119,134	$170,152
1/1/29	7th Year	$75,000	$92,241	$2,383	$144,691	$175,257
1/1/30	8th Year	$75,000	$95,008	$2,894	$167,991	$180,515
1/1/31	9th Year	$75,000	$97,858	$3,360	$188,907	$185,930
1/1/32	10th Year	$75,000	$100,794	$3,778	$207,305	$191,508
1/1/33	11th Year	$75,000	$103,818	$4,146	$223,048	$197,253
1/1/34	12th Year	$75,000	$106,932	$4,461	$235,991	$203,171
1/1/35	13th Year	$75,000	$110,140	$4,720	$245,984	$209,266
1/1/36	14th Year	$75,000	$113,444	$4,920	$252,874	$215,544
1/1/37	15th Year	$75,000	$116,848	$5,057	$256,498	$222,010
1/1/38	16th Year	$75,000	$120,353	$5,130	$256,689	$228,671
1/1/39	17th Year	$75,000	$123,964	$5,134	$253,273	$235,531
1/1/40	18th Year	$75,000	$127,682	$5,065	$246,070	$242,597
1/1/41	19th Year	$75,000	$131,513	$4,921	$234,893	$249,875

Notes: There is no detailed R&R schedule. R&R is budgeted annually. As a "place keeper," average R&R costs were estimated. A Discretionary Annuity amount was added so that at the end of the 20-year modeling period, the balance will equal twice the average of the annual replacement cost amounts, not including interest paid for borrowing during the negative balance years.

Starting Account Balance	$0
Minimum Annual Annuity	$105,130
Discretionary Annuity	$10,284
Required Annual Deposit (Annuity) to Replacement Account	**$115,414**

(This amount is included in Table 4 as an operating cost.)

Table 8 - Average Cost Classification

Butler County, KS RWD #5, Water Rates Model 2023-4

This table distributes costs from a representative year (the "average rate structure basis year) to fixed and variable categories (see Definitions) in order to calculate the "cost of service" rate structure for that year.

The average rate structure basis year runs from: 1/1/2027 through 12/31/2027

Cost Items During the Basis Year	Cost During Basis Year	Fixed Cost %	Variable Cost %	Fixed Cost	Variable Cost
Salaries and wages	$401,551	25.0%	75.0%	$100,388	$301,163
Payroll taxes	$29,225	25.0%	75.0%	$7,306	$21,919
Employer medical insurance	$57,929	25.0%	75.0%	$14,482	$43,447
Uniforms	$201	25.0%	75.0%	$50	$151
Maintenance	$201,531	100.0%	0.0%	$201,531	$0
Vehicle fuel	$31,729	100.0%	0.0%	$31,729	$0
Vehicle maintenance	$42,955	100.0%	0.0%	$42,955	$0
Radio repair (Meter Pits)	$80,000	100.0%	0.0%	$80,000	$0
Repair	$0	100.0%	0.0%	$0	$0
Engineering Fees	$46,305	29.4%	70.6%	$13,614	$32,691
Miscellaneous operating expenses	$0	25.0%	75.0%	$0	$0
Utilities	$85,458	0.0%	100.0%	$0	$85,458
Telephone	$20,570	100.0%	0.0%	$20,570	$0
Accounting services	$46,305	29.4%	70.6%	$13,614	$32,691
Office supplies	$53,812	100.0%	0.0%	$53,812	$0
Office and general administrative expenses	$0	100.0%	0.0%	$0	$0
Computer supplies	$0	100.0%	0.0%	$0	$0
Printing costs	$5,849	100.0%	0.0%	$5,849	$0
On-line payment monthly charge	$0	29.4%	70.6%	$0	$0
Dues and subscriptions	$6,078	25.0%	75.0%	$1,519	$4,558
Donations	$122	29.4%	70.6%	$36	$86
Convention and travel	$106	25.0%	75.0%	$26	$79
Computer annual software fees	$32,877	29.4%	70.6%	$9,666	$23,211
Postage and freight	$5,677	100.0%	0.0%	$5,677	$0
Insurance expense	$71,884	100.0%	0.0%	$71,884	$0
Legal fees	$10,147	100.0%	0.0%	$10,147	$0
Accounting fees	$0	100.0%	0.0%	$0	$0
Real estate taxes	$9	100.0%	0.0%	$9	$0

Table 8 - Average Cost Classification

Cost Items During the Basis Year	Cost During Basis Year	Fixed Cost %	Variable Cost %	Fixed Cost	Variable Cost
Andover franchise fee	$0	100.0%	0.0%	$0	$0
Miscellaneous expenses	$3,802	100.0%	0.0%	$3,802	$0
Engineering	$0	29.4%	70.6%	$0	$0
Furniture and equipment	$11,699	29.4%	70.6%	$3,439	$8,259
Depreciation expense	$623,491	29.4%	70.6%	$183,306	$440,185
Interest expense	$7,423	0.0%	100.0%	$0	$7,423
Wichita Project interest expense	$0	0.0%	100.0%	$0	$0
Water purchased - El Dorado	$477,472	0.0%	100.0%	$0	$477,472
Water purchased - Wichita	$617,009	0.0%	100.0%	$0	$617,009
Clean drinking water fee	$10,679	0.0%	100.0%	$0	$10,679
Set meters and water line	$77,961	29.4%	70.6%	$22,921	$55,040
Telemetry and reports	$14,307	29.4%	70.6%	$4,206	$10,100
Annual Payment to R&R Reserve (Table 7)	$115,414	29.4%	70.6%	$33,932	$81,482
User Charge Analysis Services	$0	29.4%	70.6%	$0	$0
Total CIP-related Payouts, Less Capacity Charges From Tables 14 & 16 (This value can be negative)	$505,017	29.4%	70.6%	$148,475	$356,542
Grand Total Costs, Weighted Avg Percentages	$3,694,591	29.4%	70.6%	$1,084,944	$2,609,647

Bases for Cost to Serve Rate Structure				
		100%	$3,694,591	
Number Customers During Basis Year	2,434	Unbilled-for Water for the test year is Estimated at		31%
Billed Volume, in Gallons, During Basis Year	161,933,721	Unbilled-for Water is Estimated at This % of Average Cost (Marginal Cost Rate)		49%
Average Fixed Cost per User per Month During Basis Year	$37.15	At Recommended Unit Charge Rates, Resulting Marginal Cost of Unbilled-for Water		$450,235
Average Variable Cost to Produce per 1,000 Gallons During Basis Year	$16.12	Test Year Customer Volume, in Gallons		146,299,200
Gallons per Billing Cycle Used by Average Residential Customer	4,113	+ Test Year Unbilled-for Water, in Gallons		66,299,770
		Total Test Year Volume, in Gallons, From Master Meter Readings		212,598,970

Table 9 - Marginal Cost Classification

Butler County, KS RWD #5, Water Rates Model 2023-4

The utility incurs "marginal" costs. These costs are unavoidable. Thus, the utility must collect minimal fees from various customers to "break even" on a marginal cost basis. Costs vary by customer type and volume used.

Below, it is assumed that marginal variable costs are being calculated for: Unaccounted-for Water

(Fixed costs are irrelevant in this case)

The marginal rate structure basis year runs from: 1/1/2027 through 12/31/2027

Cost Items During the Basis Year	Fixed Cost	Variable Cost	Marginal Fixed Cost %	Marginal Variable Cost %	Marginal Fixed Cost	Marginal Variable Cost
Salaries and wages	$100,388	$301,163	10%	10%	$10,039	$30,116
Payroll taxes	$7,306	$21,919	10%	10%	$731	$2,192
Employer medical insurance	$14,482	$43,447	10%	10%	$1,448	$4,345
Uniforms	$50	$151	10%	10%	$5	$15
Maintenance	$201,531	$0	10%	10%	$20,153	$0
Vehicle fuel	$31,729	$0	10%	10%	$3,173	$0
Vehicle maintenance	$42,955	$0	10%	10%	$4,295	$0
Radio repair (Meter Pits)	$80,000	$0	10%	10%	$8,000	$0
Repair	$0	$0	50%	50%	$0	$0
Engineering Fees	$13,614	$32,691	50%	50%	$6,807	$16,346
Miscellaneous operating expenses	$0	$0	10%	10%	$0	$0
Utilities	$0	$85,458	100%	100%	$0	$85,458
Telephone	$20,570	$0	10%	10%	$2,057	$0
Accounting services	$13,614	$32,691	10%	10%	$1,361	$3,269
Office supplies	$53,812	$0	10%	10%	$5,381	$0
Office and general administrative expenses	$0	$0	10%	10%	$0	$0
Computer supplies	$0	$0	10%	10%	$0	$0
Printing costs	$5,849	$0	10%	10%	$585	$0
On-line payment monthly charge	$0	$0	10%	10%	$0	$0
Dues and subscriptions	$1,519	$4,558	10%	10%	$152	$456
Donations	$36	$86	10%	10%	$4	$9
Convention and travel	$26	$79	10%	10%	$3	$8
Computer annual software fees	$9,666	$23,211	10%	10%	$967	$2,321
Postage and freight	$5,677	$0	10%	10%	$568	$0
Insurance expense	$71,884	$0	10%	10%	$7,188	$0

Table 9 - Marginal Cost Classification

Cost Items During the Basis Year	Fixed Cost	Variable Cost	Marginal Fixed Cost %	Marginal Variable Cost %	Marginal Fixed Cost	Marginal Variable Cost
Legal fees	$10,147	$0	10%	10%	$1,015	$0
Accounting fees	$0	$0	10%	10%	$0	$0
Real estate taxes	$9	$0	10%	10%	$1	$0
Andover franchise fee	$0	$0	10%	10%	$0	$0
Miscellaneous expenses	$3,802	$0	10%	10%	$380	$0
Engineering	$0	$0	100%	100%	$0	$0
Furniture and equipment	$3,439	$8,259	10%	10%	$344	$826
Depreciation expense	$183,306	$440,185	0%	0%	$0	$0
Interest expense	$0	$7,423	10%	10%	$0	$742
Wichita Project interest expense	$0	$0	10%	10%	$0	$0
Water purchased - El Dorado	$0	$477,472	100%	100%	$0	$477,472
Water purchased - Wichita	$0	$617,009	100%	100%	$0	$617,009
Clean drinking water fee	$0	$10,679	10%	10%	$0	$1,068
Set meters and water line	$22,921	$55,040	0%	0%	$0	$0
Telemetry and reports	$4,206	$10,100	10%	10%	$421	$1,010
Annual Payment to R&R Reserve (Table 7)	$33,932	$81,482	10%	10%	$3,393	$8,148
User Charge Analysis Services	$0	$0	10%	10%	$0	$0
Total CIP-related Payouts, Less Capacity Charges From Tables 14 & 16 (This value can be negative)	$148,475	$356,542	10%	10%	$14,847	$35,654
Grand Total All Costs	$1,084,944	$2,609,647			$93,317	$1,286,464
	$3,694,591				$1,379,781	

Marginal Fixed and Variable Cost Bases
(For the Customer Type(s) Listed Above)

	Monthly Marginal Fixed Cost per Customer	Marginal Variable Cost per 1,000 Gallons
	$3.19	
Marginal Fixed Cost as a Percent of Total Fixed Cost:	9%	$7.94
Marginal Variable Cost as a Percent of Total Variable Cost:		49%

Table 10 - Initial Rate Adjustments and Resulting Revenues

Butler County, KS RWD #5, Water Rates Model 2023-4

This table calculates a new set of user charge rates and the revenues they would generate.

7/1/23 Date when fees will first be collected at adjusted rates. Actual adjustment should occur one billing cycle earlier.

If there are no special costs to consider and before capacity costs are added, if appropriate, rates for a 5/8" meter would be in a "cost-to-serve" structure when: there is no usage allowance,
the base minimum charge is $22.54 Monthly, and the unit charge is set at $9.78 per 1,000 Gallons.

After rate adjustments are made, customers will be billed monthly.

Following are Blended Sales Revenues: Sales at the current (Test Year) rates (gray highlighted column) will apply until rates are adjusted. Sales at the modeled rates (yellow highlighted column) would apply after the modeled rates are adopted. Adding both together, the "blended" sales revenues show in the right-most column.

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Gallons)	Volume Range Top (in Gallons)	Sales This Year at Current Rates	Minimum Charge for Calculation Purposes	New Usage Allowance in 1,000s	New Unit Charge per 1,000 Gallons	Sales This Year at Modeled Rates	Total "Blended" Sales This Year
5/8, 3/4 Inch Meters	0	999	$97,419	$30.00	0.000	$9.78	$113,947	$211,365
	1,000	1,999	$97,419	$30.00	0.000	$9.78	$113,947	$211,365
	2,000	2,999	$97,419	$30.00	0.000	$9.78	$113,947	$211,365
	3,000	4,112	$108,410	$30.00	0.000	$9.78	$126,803	$235,213
	4,113	4,999	$343,831	$30.00	0.000	$9.78	$349,529	$693,360
1 Inch Meter	0	999	$12,645	$36.59	0.000	$9.78	$14,791	$27,436
	1,000	1,999	$12,645	$36.59	0.000	$9.78	$14,791	$27,436
	2,000	2,999	$12,645	$36.59	0.000	$9.78	$14,791	$27,436
	3,000	4,112	$14,072	$36.59	0.000	$9.78	$16,459	$30,531
	4,113	4,999	$44,630	$36.59	0.000	$9.78	$55,342	$99,972
1.5 Inch Meter	0	999	$202	$50.64	0.000	$9.78	$237	$439
	1,000	1,999	$202	$50.64	0.000	$9.78	$237	$439
	2,000	2,999	$202	$50.64	0.000	$9.78	$237	$439
	3,000	4,112	$225	$50.64	0.000	$9.78	$263	$489
	4,113	4,999	$952	$50.64	0.000	$9.78	$1,225	$2,178
2 Inch Meter	0	999	$658	$67.51	0.000	$9.78	$769	$1,427
	1,000	1,999	$658	$67.51	0.000	$9.78	$769	$1,427
	2,000	2,999	$658	$67.51	0.000	$9.78	$769	$1,427
	3,000	4,112	$732	$67.51	0.000	$9.78	$856	$1,588
	4,113	4,999	$3,094	$67.51	0.000	$9.78	$5,309	$8,403
3 Inch Meter	0	999	$51	$112.47	0.000	$9.78	$59	$110
	1,000	1,999	$51	$112.47	0.000	$9.78	$59	$110
	2,000	2,999	$51	$112.47	0.000	$9.78	$59	$110
	3,000	4,112	$56	$112.47	0.000	$9.78	$66	$122
	4,113	4,999	$547	$112.47	0.000	$9.78	$680	$1,228

Table 10 - Initial Rate Adjustments and Resulting Revenues

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Gallons)	Volume Range Top (in Gallons)	Sales This Year at Current Rates	Minimum Charge for Calculation Purposes	New Usage Allowance in 1,000s	New Unit Charge per 1,000 Gallons	Sales This Year at Modeled Rates	Total "Blended" Sales This Year
4 Inch Meter (Towanda)	0	999	$32	$150.00	0.000	$5.74	$35	$67
	1,000	1,999	$32	$150.00	0.000	$5.74	$35	$67
	2,000	2,999	$32	$150.00	0.000	$5.74	$35	$67
	3,000	4,112	$36	$150.00	0.000	$5.74	$39	$74
	4,113	4,999	$28	$150.00	0.000	$5.74	$31	$59
	5,000	5,999	$32	$150.00	0.000	$5.74	$35	$67
	6,000	6,999	$32	$150.00	0.000	$5.74	$35	$67
	7,000	7,999	$32	$150.00	0.000	$5.74	$35	$67
	8,000	8,999	$32	$150.00	0.000	$5.74	$35	$67
	9,000	9,999	$32	$150.00	0.000	$5.74	$35	$67
	10,000	19,999	$320	$150.00	0.000	$5.74	$347	$667
	20,000	29,999	$320	$150.00	0.000	$5.74	$347	$667
	30,000	39,999	$320	$150.00	0.000	$5.74	$347	$667
	40,000	49,999	$320	$150.00	0.000	$5.74	$347	$667
	50,000	59,999	$320	$150.00	0.000	$5.74	$347	$667
	60,000	69,999	$320	$150.00	0.000	$5.74	$347	$667
	70,000	79,999	$320	$150.00	0.000	$5.74	$347	$667
	80,000	89,999	$320	$150.00	0.000	$5.74	$347	$667
	90,000	99,999	$320	$150.00	0.000	$5.74	$347	$667
	100,000	199,999	$3,197	$150.00	0.000	$5.74	$3,472	$6,670
	200,000	299,999	$3,197	$150.00	0.000	$5.74	$3,472	$6,670
	300,000	399,999	$3,197	$150.00	0.000	$5.74	$3,472	$6,670
	400,000	499,999	$3,197	$150.00	0.000	$5.74	$3,472	$6,670
	500,000	599,999	$3,197	$150.00	0.000	$5.74	$3,472	$6,670
	600,000	699,999	$3,197	$150.00	0.000	$5.74	$3,472	$6,670
	700,000	3,151,607	$78,385	$150.00	0.000	$5.74	$85,127	$163,513
	3,151,608	3,151,608	$0	$150.00	0.000	$5.74	$907	$907
6 Inch Meter	0	999	$202	$303.57	0.000	$9.78	$237	$439
	1,000	1,999	$202	$303.57	0.000	$9.78	$237	$439
	2,000	2,999	$202	$303.57	0.000	$9.78	$237	$439
	3,000	4,112	$225	$303.57	0.000	$9.78	$263	$489
	4,113	4,999	$7,022	$303.57	0.000	$9.78	$7,345	$14,367
Contract Water	0	999	$0	$100.00	0.000	$11.78	$0	$0
	800,000	800,000	$0	$100.00	0.000	$11.78	$0	$0
						Total Blended Rate Revenues for the Year		$2,022,692

Note: New Minimum Charge Base Rates: If meter size-based minimum charges are to be used, and the user classes modeled above include meter or connection sizes, the amounts shown in this column include meter size surcharges as calculated in Table 16. Either way, the narrative report includes the rates and surcharges to assess.

6.0	months at the old user charge rates	and	6.0	months at the new user charge rates.

Table 11 - AWWA Safe Operating Flow by Meter Size

Butler County, KS RWD #5, Water Rates Model 2023-4

Water meter data source: Table VII.2-5, page 338, American Water Works Association Manual M1, Principles of Water Rates, Fees and Charges, Seventh Edition

Fire sprinkler data source: National Fire Protection Association

This table calculates the meter equivalent ratio, which is used for calculating peak flow capacity-based system development fees, surcharges and revenues in Tables 13 through 16 for water meters, and when applicable, capacity costs for fire sprinklers.

Meter Size, in Inches	Meter Type	Maximum-Rated Safe Operating Flow, in gallons per minute	Meter Equivalent Ratio (Capacity Shares)	Equivalent Fire Sprinkler Square Footage*
Five Eighths	Displacement	20	1.0	100
Three Quarters	Displacement	30	1.5	150
One Inch	Displacement	50	2.5	250
One & a Half Inch	Displacement	100	5.0	500
Two Inch	Displacement	160	8.0	800
Three	Singlet	320	16.0	1,600
Three	Compound, Class I	320	16.0	1,600
Three	Turbine, Class I	350	17.5	1,750
Four	Singlet	500	25.0	2,500
Four	Compound, Class I	500	25.0	2,500
Four	Turbine, Class I	630	31.0	3,150
Six	Singlet	1,000	50.0	5,000
Six	Compound, Class I	1,000	50.0	5,000
Six	Turbine, Class I	1,300	65.0	6,500
Eight	Compound, Class I	1,600	80.0	8,000
Eight	Turbine, Class I	2,800	140.0	14,000
Ten	Turbine, Class II	4,200	210.0	21,000

* If applicable, see Table 12B for sprinkler calculations and explanations.

Table 12 - Flow Capacity Costs
Butler County, KS RWD #5, Water Rates Model 2023-4

Building system capacity and connecting new customers to the system costs money. Those costs must be recovered. That can be done on the "front end" with system development fees and connection fees. It can be done later with system development surcharges to the minimum charge. It is usually most practical to use a blend of both. This table shows capacity costs. From these costs, system development fees and surcharges were developed in Tables 13 through 16.

Peak and Base Flow Capacity Costs

	Costs Related to Water Service						
Fixed Assets Net of Depreciation (Capacity Cost)	% of That Value Attributable to Regular Water Service	% Attributable to Water Peak Capacity	Peak Water Capacity Cost	Annual Water Peak Capacity Cost (40-year Depreciation)*	% of Value Attributable to Water Base Flow Capacity	Base Flow Capacity Cost for Water Service	Annual Water Base Capacity Cost (40-year Depreciation)*
$9,092,038	100.0%	50.0%	$4,546,019	$196,672	50.0%	$4,546,019	$196,672

* It is assumed full system replacement costs will escalate each year by: 3.0%

How Water System Capacity Costs Will Be Recovered

These costs are modeled to be recovered from system development fees in Tables 13 and 14

Part of Peak Flow Capacity Costs to be Recovered by System Development Fees

18.65%	Target Percentage of Annualized Costs to Recover
$36,679.25	Target Portion of Annualized Costs to Recover
$666.90	Peak Capacity Cost per Capacity Share

Part of Base Flow Capacity Costs to be Recovered by System Development Fees, if Any

93.20%	Target Percentage of Annualized Costs to Recover
$183,297.92	Target Portion of Annualized Costs to Recover
$3,332.69	Base Capacity Cost per New Capacity Share

Note: Base flow costs will be recovered with system development fees by the dollar amounts shown above.

In addition to peak and base flow-based system development fees caculated above, each new connection should reimburse the utility for all "out-of-pocket" connection costs it incurs. Such costs were not included in these calculations.

These costs are modeled to be recovered from minimum charge surcharges in Tables 15 and 16

Part of Peak Flow Capacity Costs to be Recovered by Minimum Charge Surcharges

100%	Target Percentage of Costs to Recover
$196,671.59	Target Portion of Costs to Recover in One Full Year
$16,389.30	Target Portion of Costs to Recover in Monthly Surcharges
$5.62	Monthly Surcharge per Peak Capacity Share

Table 13 - System Development Fees
Butler County, KS RWD #5, Water Rates Model 2023-4

This table calculates system development fees to assess to each meter size.

Note: Larger meter sizes are available in two or more types, some having different flow capacities. To be conservative when projecting revenues, it was assumed all meters in use are of the lowest capacity types. However, when setting fees, they should be based upon the type of meter in use at each location.

Meter Size	Meter Size in Inches	Meter Size in Square Inches	Number Meters This Size	New Taps (Customer Growth) in a Typical Year	AWWA Capacity "Share" Factor, Compared to 5/8 Inch Meter	Foot Notes	Peak Capacity Cost per Capacity Share From Table 11	Peak Capacity Cost per Meter This Class	Base Capacity Cost per New Customer	**System Development Fee**
Five Eighths	0.625	0.307	1,926	48.2	1.0		$667	$667	$3,332.69	**$4,000**
Three Quarters	0.750	0.442	0	0.0	1.0	1	$667	$667	$3,332.69	**$4,000**
One Inch	1.000	0.785	250	6.3	2.5		$667	$1,667	$3,332.69	**$5,000**
One & a Half Inch	1.500	1.767	4	0.1	5.0		$667	$3,334	$3,332.69	**$6,667**
Two Inch	2.000	3.142	13	0.3	8.0		$667	$5,335	$3,332.69	**$8,668**
Two & a Half Inch	2.500	4.909	0	0.0	12.5	2	$667	$8,336	$3,332.69	**$11,669**
Three Inch	3.000	7.069	0	0.0	17.5		$667	$11,671	$3,332.69	**$15,003**
Four Inch	4.000	12.566	0	0.0	31.0		$667	$20,674	$3,332.69	**$24,006**
Six Inch	6.000	28.274	0	0.0	65.0		$667	$43,348	$3,332.69	**$46,681**
Eight Inch	8.000	50.266	0	0.0	140.0		$667	$93,365	$3,332.69	**$96,698**
Ten Inch	10.000	78.540	0	0.0	210.0		$667	$140,048	$3,332.69	**$143,381**
			2,199	55.0						

Foot Notes, which apply to Tables 14, 15 and 16, as well:

[1] The Three-Quarter-Inch meter capacity share factor is 1.5. However, it was set equal to the Five-eighths-Inch meter because most such meters are used for residential connections. This enables a uniform system development fee for almost all residential customers.

[2] These meter sizes were not included in AWWA study results, so these values are estimates.

Table 14 - Revenues From System Development Fees

Butler County, KS RWD #5, Water Rates Model 2023-4

This table calculates total fee revenues that would be generated during one full year at the fees in Table 13.

Meter Size	New Taps (Customer Growth) in a Typical Year	System Development Fee	**Total Annual System Development Fees**
Five Eighths	48.2	$4,000	**$192,668**
Three Quarters	0.0	$4,000	**$0**
One Inch	6.3	$5,000	**$31,264**
One & a Half Inch	0.1	$6,667	**$667**
Two Inch	0.3	$8,668	**$2,818**
Two & a Half Inch	0.0	$11,669	**$0**
Three Inch	0.0	$14,003	**$350**
Four Inch	0.0	$20,005	**$500**
Six Inch	0.1	$36,677	**$3,669**
Eight Inch	0.0	$96,698	**$0**
Ten Inch	0.0	$143,381	**$0**
	55.0		**$231,937**

This is the amount used to calculate the "Meter Size-based System Development Fees" income in Table 3.

Table 15 - Minimum Charge Fees, Including Capacity Surcharges

Butler County, KS RWD #5, Water Rates Model 2023-4

This table does, essentially, the same thing as Table 13, except costs are recovered over time as minimum charge surcharges.

Meter Size	Capacity Shares Each Meter Size After Adjustment	Monthly Surcharge per Peak Capacity Share (Table 11)	Peak Capacity Cost per Meter Size	Cost-to-Serve Minimum Charge From Table 10	**Monthly Minimum Charge, Including Peak Capacity**
Five Eighths	1.0	$5.62	$5.62	$22.54	**$28.16**
Three Quarters	1.0	$5.62	$5.62	$22.54	**$28.16**
One Inch	2.5	$5.62	$14.05	$22.54	**$36.59**
One & a Half Inch	5.0	$5.62	$28.10	$22.54	**$50.64**
Two Inch	8.0	$5.62	$44.96	$22.54	**$67.51**
Two & a Half Inch	12.5	$5.62	$70.26	$22.54	**$92.80**
Three Inch	17.5	$5.62	$98.36	$22.54	**$120.90**
Four Inch	31.0	$5.62	$174.23	$22.54	**$196.78**
Six Inch	65.0	$5.62	$365.33	$22.54	**$387.87**
Eight Inch	140.0	$5.62	$786.87	$22.54	**$809.41**
Ten Inch	210.0	$5.62	$1,180.30	$22.54	**$1,202.84**

Table 16 - Revenues From Minimum Charge Surcharges

Butler County, KS RWD #5, Water Rates Model 2023-4

This table calculates total minimum charge surcharge revenues that would be generated during one full year at the fees in Table 15.

Meter Size	Meter Type	Number Meters This Size	Total Adjusted Capacity Shares	**Annual Peak Capacity Surcharge Revenues**
Five Eighths	Displacement	1,926	1	**$129,900**
Three Quarters	Displacement	0	1	**$0**
One Inch	Displacement	250	3	**$42,154**
One & a Half Inch	Displacement	4	5	**$1,349**
Two Inch	Displacement	13	8	**$7,014**
Two & a Half Inch	Displacement	0	13	**$0**
Three Inch	Singlet	1	16	**$1,079**
Four Inch	Singlet	1	25	**$1,686**
Six Inch	Singlet	4	50	**$13,489**
Eight Inch	Turbine, Class I	0	140	**$0**
Ten Inch	Turbine, Class II	0	210	**$0**
		2,199	3,925	**$196,672**

Table 17 - Financial Capacity Indicators and Reserves
Butler County, KS RWD #5, Water Rates Model 2023-4

This table depicts the affordability of future rates, the financial health of the system and the ending balances in various (assumed) accounts for the test year and the next 10 years.

Capacity Indicators	Test Year Starting 1/1/22	0 Year Starting 1/1/23	1st Year Starting 1/1/24	2nd Year Starting 1/1/25	3rd Year Starting 1/1/26	4th Year Starting 1/1/27	5th Year Starting 1/1/28	6th Year Starting 1/1/29	7th Year Starting 1/1/30	8th Year Starting 1/1/31	9th Year Starting 1/1/32	10th Year Starting 1/1/33
Customary Affordability Index: Monthly Bill for a 5,000 gal per Month, Small Meter Residential Customer	$72.50	$78.90	$82.06	$85.34	$88.75	$92.30	$95.99	$99.83	$103.83	$107.98	$112.30	$116.79
AMHI Within Service Area	$65,379	$66,564	$67,770	$68,998	$70,248	$71,520	$72,816	$74,135	$75,478	$76,846	$78,238	$79,655
Affordability Index: Current Rates First Column, Modeled Rates After That	1.33%	1.42%	1.45%	1.48%	1.52%	1.55%	1.58%	1.62%	1.65%	1.69%	1.72%	1.76%
National Average Affordability Index: Commonly Accepted but Not Statistically Verifiable	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

Affordability Index (AI) goes to the willingness and ability of customers to pay. AI is the cost of 60,000 gallons of residential service per year (5,000 gallons per month) divided by the Annual Median Household Income (AMHI) in the service area (gleaned from Census data or a survey). Rates near 1.0% are common in the U.S. and are generally considered affordable. Most grant agencies will decline to award grants if the AI is less than 1.5 to 2.0%, unless other eligibility criteria considered along with the AI make an applicant eligible.

Low-income, Low-volume "Affordability Index"												
Monthly Bill for a 2,000 gal per Month, Low-income Residential Customer	$47.00	$49.56	$51.54	$53.60	$55.75	$57.98	$60.30	$62.71	$65.22	$67.83	$70.54	$73.36
Income at One-half the AMHI and Rising at One-half the Rate Above	$32,690	$32,986	$33,285	$33,586	$33,890	$34,197	$34,507	$34,820	$35,135	$35,453	$35,775	$36,099
Affordability for Low-income, Low-volume: Current Rates First Column, Modeled Rates After That	1.73%	1.80%	1.86%	1.92%	1.97%	2.03%	2.10%	2.16%	2.23%	2.30%	2.37%	2.44%

This additional indicator of affordability assumes a residential customer with income at one-half the median household income above, that income is growing at one-half the rate of the median household income and the customer uses 2,000 gallons per month. Such a customer is likely either a minimum wage or near-minimum wage worker, or is retired and living only on Social Security benefits. Such customers are more commonly the "slow pays" and "no pays" compared to others, so this indicator goes to the "business sense" of the rates modeled here. In other words, raise this customer's bill too much and they are more likely to pay late or not pay.

Estimated Operating Ratio: Current Rates First Column, Modeled Rates After That	1.18	1.02	1.04	1.05	1.06	1.05	1.08	1.09	1.10	1.11	1.11	1.12

Operating ratio (OR) is a measure of the utility's ability to pay its operating expenses using only current incomes. A 1.0 OR is break even. Below 1.0 indicates operating in the "red." Generally, the OR should be at least 1.15 for large systems, 1.30 or more for medium-sized systems and perhaps as high as 2.0 for small systems. Note: If the utility has or will have reserves (below,) it has more ability to pay its operating costs than this calculation of OR implies.

Estimated Coverage Ratio: Current Rates First Column, Modeled Rates After That	1.40	0.00	0.11	0.24	0.21	0.11	0.29	0.28	0.30	0.30	0.29	0.33

Coverage Ratio (CR) goes to the ability of the utility to pay its debt payments out of current incomes. CR applies only to years with debt service. A "N.A." above indicates there was not, or in a future year there will not be debt during that year. 1.0 is break even - just enough net revenue to pay debt. Generally, the CR should be at least 1.25. Note: If the utility has or will have other available reserves (shown below,) it has more ability to make debt payments than the CR implies.

Reserves	Balance Ending on 12/31/21	Balance Ending on 12/31/22	Balance Ending on 12/31/23	Balance Ending on 12/31/24	Balance Ending on 12/31/25	Balance Ending on 12/31/26	Balance Ending on 12/31/27	Balance Ending on 12/31/28	Balance Ending on 12/31/29	Balance Ending on 12/31/30	Balance Ending on 12/31/31	Balance Ending on 12/31/32	Balance Ending on 12/31/33
Cash and Cash Equivalents	$1,002,735	$841,306	$892,497	$963,459	$1,002,836	$1,047,604	$1,116,351	$1,138,244	$1,187,248	$1,235,497	$1,290,159	$1,355,256	$1,408,872
Other Liquid Assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Undedicated Cash Assets	$1,002,735	$841,306	$892,497	$963,459	$1,002,836	$1,047,604	$1,116,351	$1,138,244	$1,187,248	$1,235,497	$1,290,159	$1,355,256	$1,408,872
Total Cash Assets Discounted for Inflation (Future Unrestricted Purchasing Power)	$1,002,735	$841,306	$892,497	$934,555	$943,569	$956,120	$988,298	$977,449	$988,945	$998,261	$1,011,153	$1,030,308	$1,071,068
Repair & Replacement	$0	-$75,000	-$38,336	-$3,256	$30,138	$61,742	$91,445	$119,134	$144,691	$167,991	$188,907	$207,305	$223,048
Debt and CIP Reserves	$1,941,436	$2,732,924	$2,914,322	$3,015,108	$2,837,622	$2,811,241	$2,635,953	$2,502,757	$2,234,490	$1,951,504	$1,619,536	$1,187,223	$695,605
Sum of All Reserves	$2,944,171	$3,499,231	$3,768,483	$3,975,311	$3,870,597	$3,920,587	$3,843,750	$3,760,136	$3,566,429	$3,354,991	$3,098,601	$2,749,785	$2,327,525

Table 18 - Bills Before and After Rate Adjustments
Butler County, KS RWD #5, Water Rates Model 2023-4

The modeled rates will generate 9.3% more revenue per year than the current rates.

However, due to rate restructuring, individual bills would change as shown in the following table. Note: The actual rates to adopt or consider are included in the narrative report.

Customer, Rate Class or Meter Size	Gallons of Use	Customers Using This Volume or Less	Customers Using This Volume or More	Bill at Now Current Rates	Bill at Modeled Rates	Modeled Bill Increase or Decrease (-)	Modeled Bill Percentage Increase or Decrease (-)
5/8, 3/4 Inch Meters	0	0	1,926	$30.00	$30.00	$0.00	0%
	1,000	0	1,926	$38.50	$39.78	$1.28	3%
	2,000	0	1,926	$47.00	$49.56	$2.56	5%
	3,000	0	1,926	$55.50	$59.34	$3.84	7%
	4,113	1,926	1,926	$64.96	$70.22	$5.26	8%
	10,000	0	0	$115.00	$127.80	$12.80	11%
	50,000	0	0	$455.00	$519.00	$64.00	14%
1 Inch Meter	0	0	250	$30.00	$36.59	$6.59	22%
	1,000	0	250	$38.50	$46.37	$7.87	20%
	2,000	0	250	$47.00	$56.15	$9.15	19%
	3,000	0	250	$55.50	$65.93	$10.43	19%
	4,113	250	250	$64.96	$76.82	$11.86	18%
	10,000	0	0	$115.00	$134.39	$19.39	17%
	50,000	0	0	$455.00	$525.59	$70.59	16%
	800,000	0	0	$6,830.00	$7,860.59	$1,030.59	15%
1.5 Inch Meter	0	0	4	$40.00	$50.64	$10.64	27%
	1,000	0	4	$48.50	$60.42	$11.92	25%
	2,000	0	4	$57.00	$70.20	$13.20	23%
	3,000	0	4	$65.50	$79.98	$14.48	22%
	4,113	4	4	$74.96	$90.87	$15.91	21%
	10,000	0	0	$125.00	$148.44	$23.44	19%
	50,000	0	0	$465.00	$539.64	$74.64	16%
	800,000	0	0	$6,840.00	$7,874.64	$1,034.64	15%
2 Inch Meter	0	0	13	$40.00	$67.51	$27.51	69%
	1,000	0	13	$48.50	$77.29	$28.79	59%
	2,000	0	13	$57.00	$87.07	$30.07	53%
	3,000	0	13	$65.50	$96.85	$31.35	48%
	4,113	13	13	$74.96	$107.73	$32.77	44%
	10,000	0	0	$125.00	$165.31	$40.31	32%
	50,000	0	0	$465.00	$556.51	$91.51	20%
	800,000	0	0	$6,840.00	$7,891.51	$1,051.51	15%

Table 18 - Bills Before and After Rate Adjustments

Customer, Rate Class or Meter Size	Gallons of Use	Customers Using This Volume or Less	Customers Using This Volume or More	Bill at Now Current Rates	Bill at Modeled Rates	Modeled Bill Increase or Decrease (-)	Modeled Bill Percentage Increase or Decrease (-)
3 Inch Meter	0	0	1	$92.00	$112.47	$20.47	22%
	1,000	0	1	$100.50	$122.25	$21.75	22%
	2,000	0	1	$109.00	$132.03	$23.03	21%
	3,000	0	1	$117.50	$141.81	$24.31	21%
	4,113	1	1	$126.96	$152.69	$25.73	20%
	10,000	0	0	$177.00	$210.27	$33.27	19%
	50,000	0	0	$517.00	$601.47	$84.47	16%
	800,000	0	0	$6,892.00	$7,936.47	$1,044.47	15%
4 Inch Meter (Towanda)	0	0	1	$150.00	$150.00	$0.00	0%
	3,151,608	1	1	$18,240.23	$18,240.23	$0.00	0%
6 Inch Meter	0	0	4	$295.00	$303.57	$8.57	3%
	1,000	0	4	$303.50	$313.35	$9.85	3%
	2,000	0	4	$312.00	$323.13	$11.13	4%
	3,000	0	4	$320.50	$332.91	$12.41	4%
	4,113	4	4	$329.96	$343.79	$13.83	4%
	10,000	0	0	$380.00	$401.37	$21.37	6%
	50,000	0	0	$720.00	$792.57	$72.57	10%
	800,000	0	0	$7,095.00	$8,127.57	$1,032.57	15%
Contract Water	0	0	0	$100.00	$100.00	$0.00	0%
	1,000	0	0	$110.50	$111.78	$1.28	1%
	2,000	0	0	$121.00	$123.56	$2.56	2%
	3,000	0	0	$131.50	$135.34	$3.84	3%
	4,113	0	0	$143.18	$148.45	$5.26	4%
	10,000	0	0	$205.00	$217.80	$12.80	6%
	50,000	0	0	$625.00	$689.00	$64.00	10%
	800,000	0	0	$8,500.00	$9,524.00	$1,024.00	12%

Chart 1 - Operating Ratio

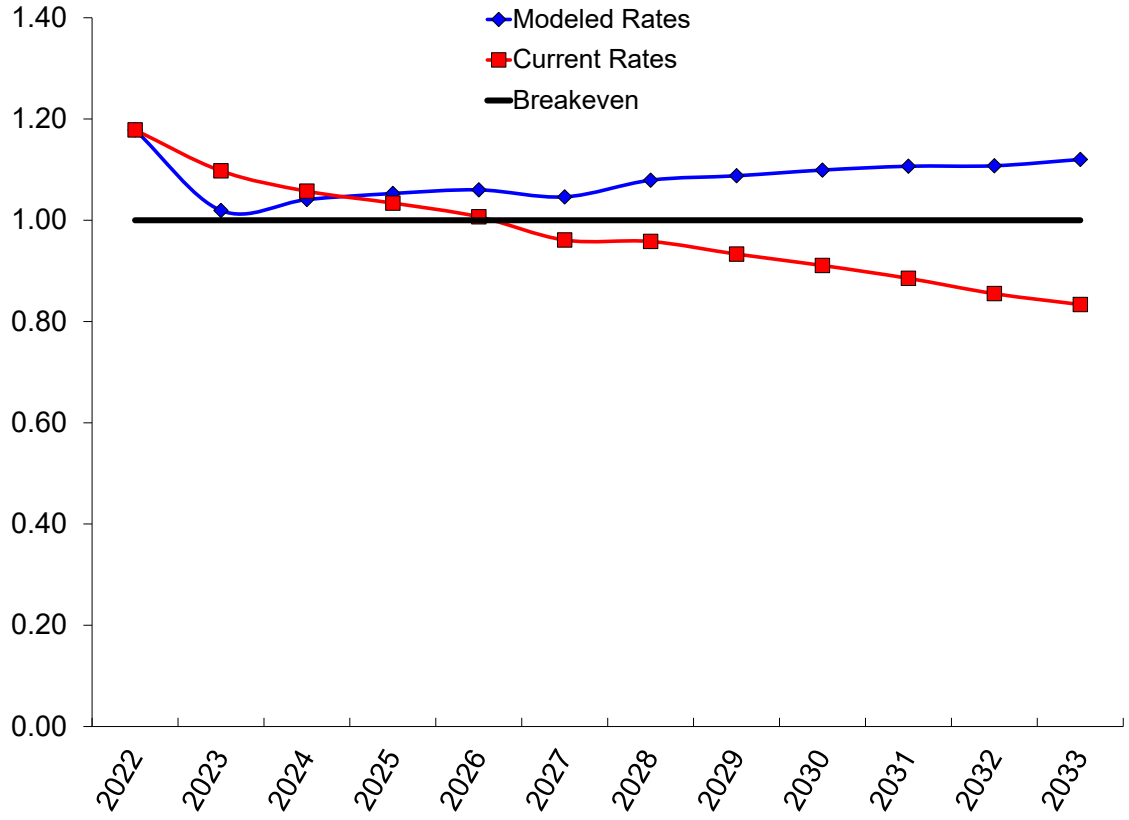

Chart 2 - Coverage Ratio

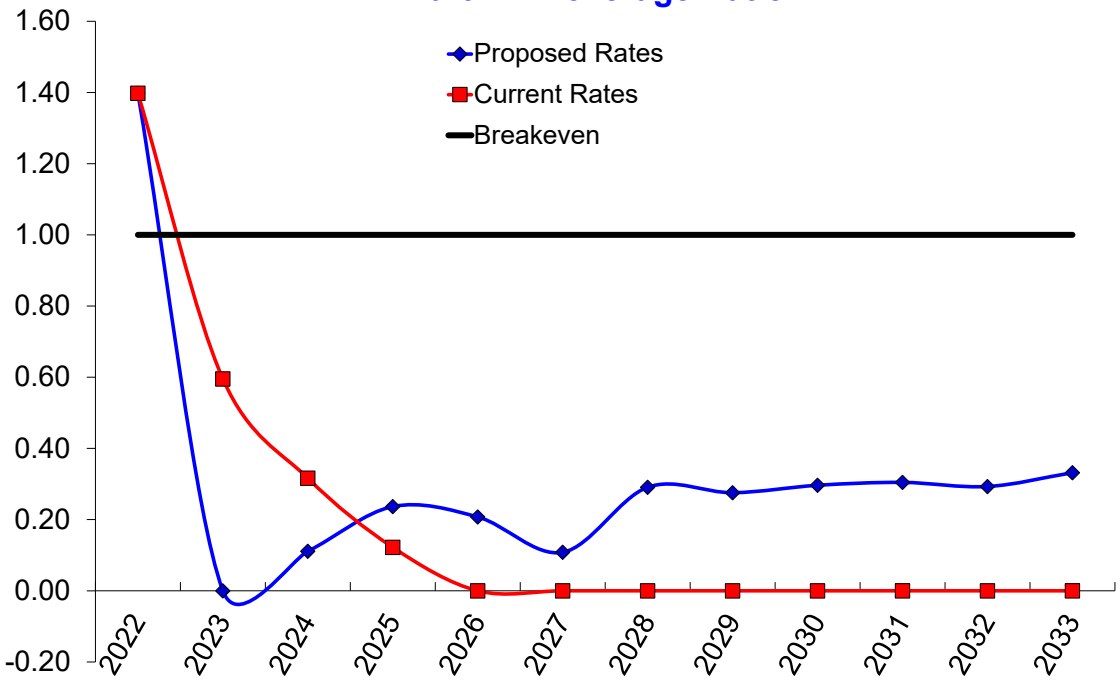

Chart 3 - Residential Users' Bills

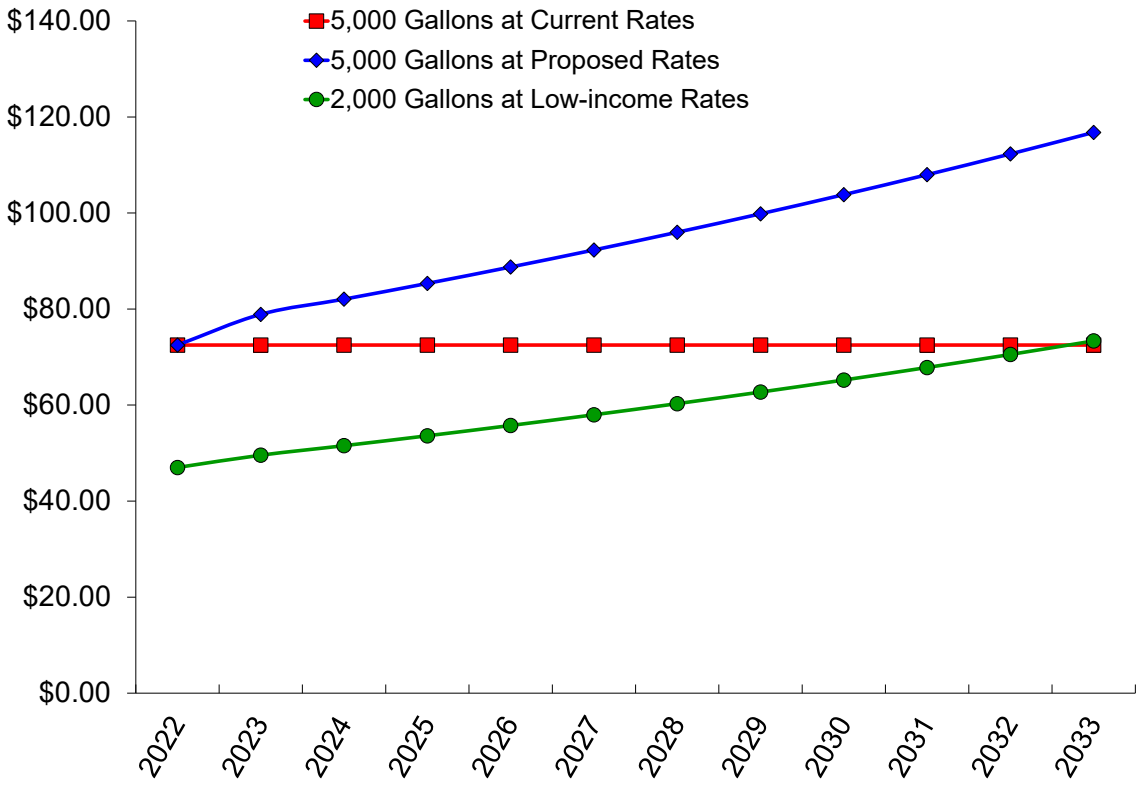

Chart 4 - Affordability

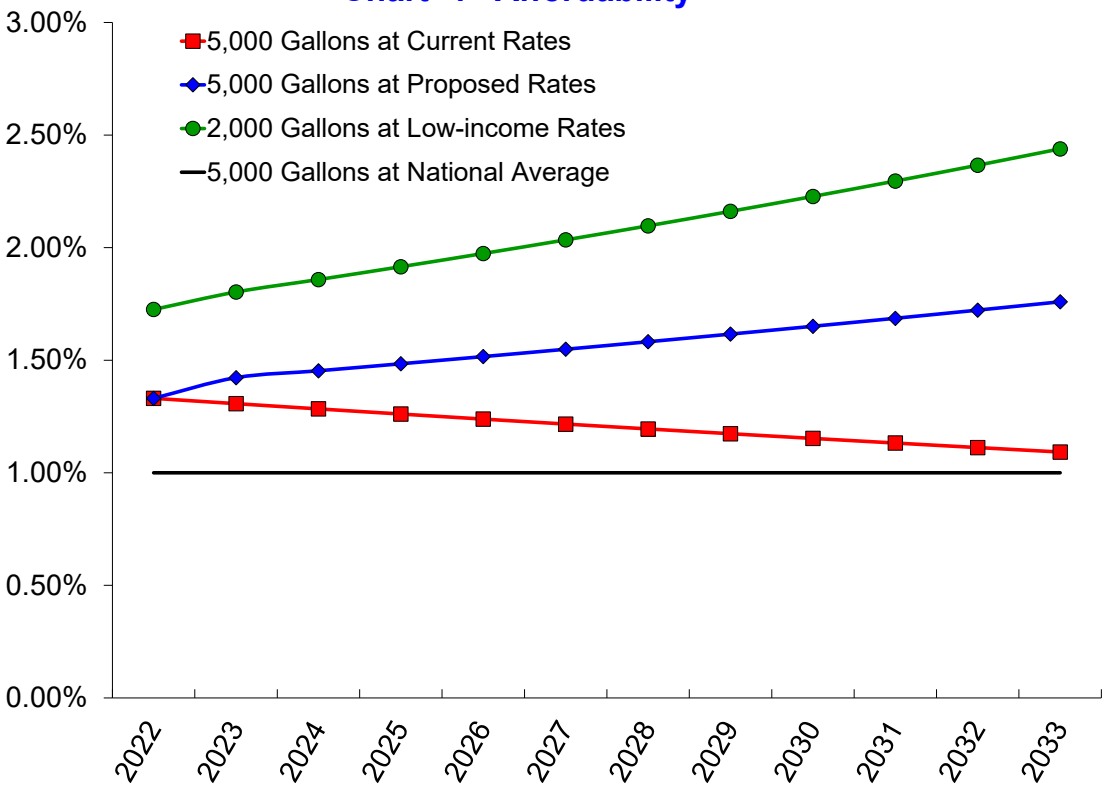

Chart 5 - Working Capital vs Goal

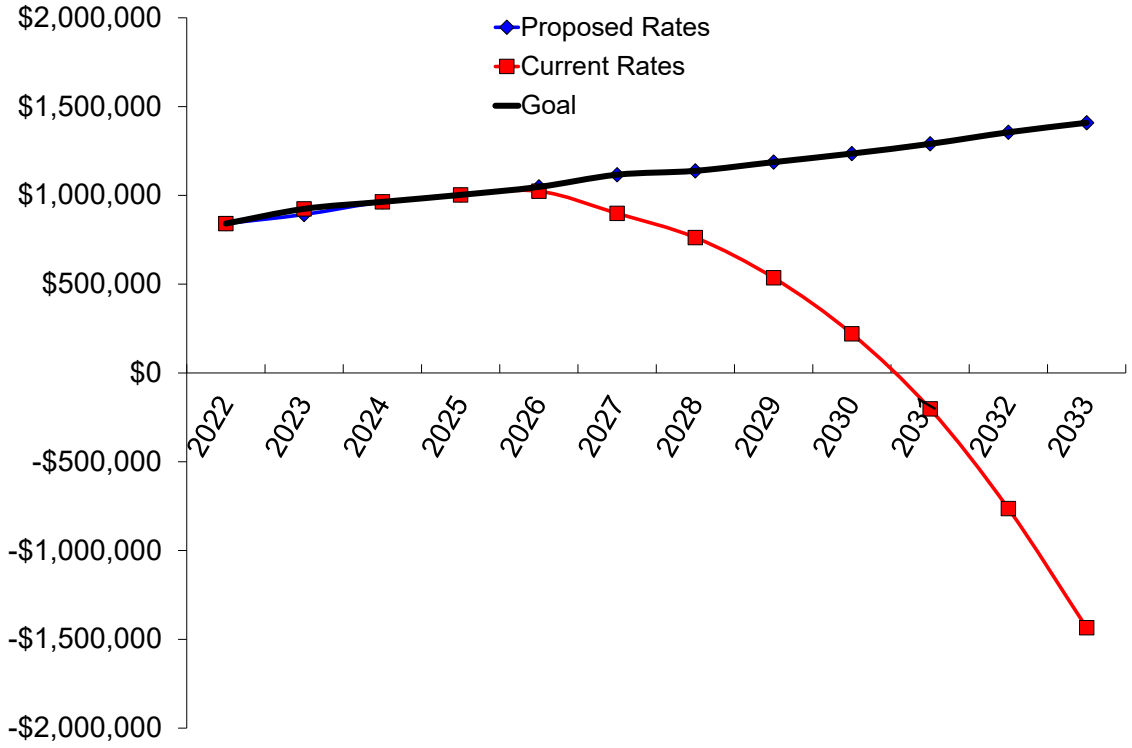

Chart 6 - Value of Cash Assets Before Inflation

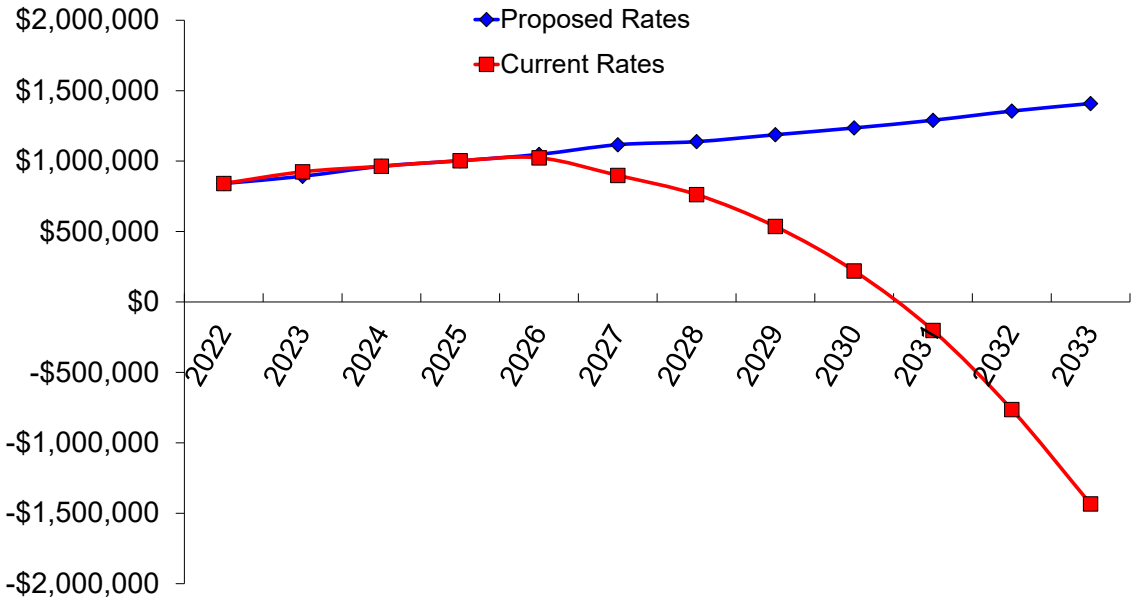

Chart 7 - Value of Cash Assets After Inflation

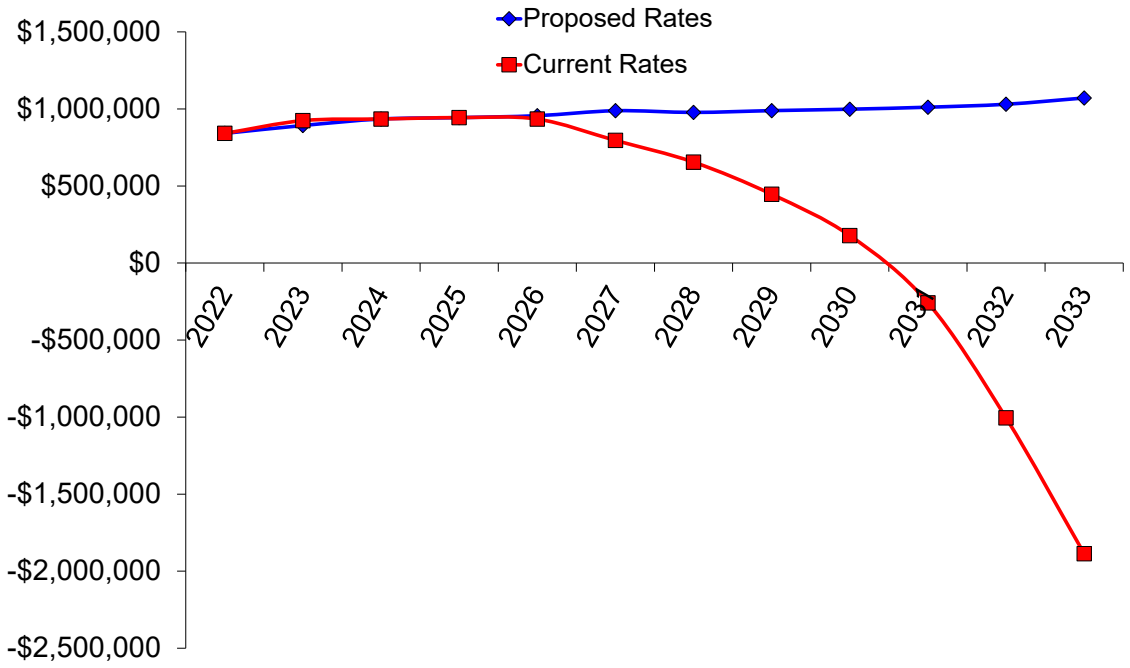

Chart 8 - Sum of All Reserves