

April 4, 2018

The Honorable Bill Kolas, Mayor
City of Higginsville
P. O. Box 110
Higginsville, MO 64037

Subject: Water User Charge Rate Analysis Report

Dear Mr. Kolas:

Attached is your rate analysis report package. Before I address the report package, I have some important housekeeping to do.

Rate analysis is data intensive, using large volumes of information and many kinds of data. I did not gather much of that data myself. Mark Epperson, Jeanette Dobson and Jessica McCormick did the lion's share of that. I'm sure other staff supported, too. To the three I worked directly with, and others I did not, I must say a big, "Thank you." I really appreciate the great help your staff gave us. That makes this work fun. But more important, it makes it accurate.

As to the report package, it contains lots of detail. I always want to uncover every possible stone to make sure I discover everything that is likely to be important in each case. Please read through the report but do not feel like you must understand everything just by reading it. When the Board is ready to consider the results and my recommendations, I will attend a Board meeting to go over everything. At that meeting, you, the Board, staff and the public will probably learn many things about what needs to happen to your water rates and why. I look forward to that.

Finally, I am sure you and the Board members know of other cities and districts that also need rate setting help. As you run into these folks at municipal league and rural water association meetings, and other venues, I hope you will tell them about my services. I get much of my business by referrals from past clients and I hope to be able to trace several future clients back to my work with Higginsville.

Best regards,
GettingGreatRates.com



Carl E. Brown
President

Enclosure

Water Rate Analysis Report for the City of Higginsville, Missouri

Prepared April 4, 2018

Carl Brown, President
GettingGreatRates.com, LLC

Executive Summary

This report covers the water rate analysis done for the City of Higginsville. Analysis determined that to pay for current and soon to be incurred costs, overall, water rate revenues need to go up modestly. Due to very significant rate restructuring, to establish rates that are much closer to a cost-to-serve, fair rate structure, some customers' bills would go down while others would go up, some quite markedly.

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Introduction

Higginsville, Missouri, later called “the City” or “you,” hired GettingGreatRates.com, later called “me,” “we” or “I,” to perform rate analysis of its water utility, produce a report of my findings and recommendations and provide you with guidance on rate setting.

Overall rate revenues need to go up modestly. Adequate rates are job one in rate setting so that part is not difficult, in your case.

Job two is setting rates in a fair structure, generally in a cost-to-serve structure (described later). Such a structure will have the minimum charges go up markedly, even with a uniform fee reduction to blunt the degree of change in minimum charges. Quite simply, your minimum charges are not nearly high enough to recover the fixed costs. Unit charges paid all customers except those using extremely high volumes will go down. For very high volumes of use, those unit charges would go up.

As to the analysis methodology, this report is the culmination of a process where I submitted information and data inquiries to City staff. Staff replied. We went through several iterations of this step. I subsequently modeled the City’s finances and rates using that data and submitted those items for review and feedback. City staff reviewed those draft submittals to assure accuracy, and in some instances, they corrected data. With that feedback, I prepared and submitted a draft full report. Again, staff reviewed and gave me feedback, from which I revised the full report slightly to arrive at this final report.

The report is in two parts. The first is this narrative report that tells readers what should be done to the utility’s rates and why. The second is a printout of the scenario spreadsheet model, later called the “Model.” The Model is a set of integrated calculations that mathematically depict the utility’s situation to arrive at the recommended rates.

As you read this report, please keep this in mind. The report does not *direct* the City 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 then make well-informed decisions about actions to take. And the report and model are not legal recommendations. For legal issues consult your attorney.

Finally, a note about meter sizes and the rates.

I am recommending meter size-based system development fees and minimum charges from a five-eighths inch water meter up to a ten-inch meter. I recommend you adopt the full slate of meter size-based rates. That way, if you have a large business or plant that wants to locate in an area you serve, you will have appropriate rates in place for them. Then, if they want to negotiate less than full price for the six-inch meter they need, for example, you will be on firm footing to stand your ground, if that is what you want to do. And if you are willing to “give,” you will be able to show the prospective new customer, and all other ratepayers, just how much you are giving to get them to locate in your service area. If you start off with no adopted fee for a six-inch meter, you place yourself at a disadvantage when a prospect tries to negotiate fees.

Cost-based Rate Calculations

To give you the “bigger picture” 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.

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 results in rates that are overly complex.

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 larger utilities 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.

When I analyze rates for government-owned water-based utilities, 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. The cost-needs approach is a static (one year) rate calculation. I enhance that approach by projecting costs and revenues into the future.

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 time period, usually in the near future, are classified as “fixed,” “variable,” “capacity to serve” or some combination of the three. Fixed costs are converted to a 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 minimum charge.

The first cut of this classification process is done in Table 8, page 40. Your rates situation is somewhat complex so the “Average Fixed Cost/User/Month” from Table 8 of the Model is used for calculating the base minimum charge. Also, from that table, the “Average Variable Cost to Produce/1,000 gallons” is the basis for calculating unit charges.

The second cut at rate structuring is to arrive at capacity costs. These were calculated in Table 11, page 48, and distributed to system development (tap-on) fees and surcharges to the minimum charge in Tables 12, page 50, and 13, page 51, respectively. The capacity “share” of costs of each meter size is based upon the calculated shares in Table 11B, page 49.

The third cut is to project costs ten years into the future. Generally, this is done by applying an expected inflationary factor to each cost.

The fourth cut is to set reserve goals and project those 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.

The fifth cut is to arrive at the full suite of rates needed to fully fund the utility. This is a dynamic set of calculations, too complex to completely explain here. I will leave out some details. The "Cliff's Notes" version is this:

- The calculated bases for fixed costs and variable costs (Table 8) establish a ratio of the revenues that each rate component would generate.
- To increase overall revenues to a target, each revenue stream is increased by the same percentage. Thus, the revenue streams remain in the same ratio to each other.
- Once the overall revenue increase need is established, the base minimum charge is "back calculated" from the minimum charge revenue stream. The unit charge is "back calculated" from the unit charge revenue stream. The resulting rates are the starting rates, what you will (hopefully) adopt initially. In later years, you will increase these starter rates and fees across-the-board by an inflationary factor.
- Of course, system development fees, minimum charge surcharges, investment earnings, penalties and other income sources generate smaller revenues, which are added to rate revenues. And, I assumed future inflationary rate increases, so those revenues are added over the years, as well. Without explaining the details, you should have a sense that, while the math is complex, the rates are calculated to be proportionate to the costs each customer causes and the revenues will be adequate to cover all costs for the next ten years. That is, if our projection of costs and other things turn out to be accurate.

Cost to serve rates are considered by many, including me, to be the most mathematically fair and defensible rate structure. However, there are often good reasons to adopt rates that are at least somewhat different from true cost-to-serve rates. Thus, a cost-based rate analysis often is just the starting point for calculating the rates that a utility may eventually decide to adopt.

I usually recommend 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, "fixed costs." 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, and related concepts, I use catch phrases. For this type of cost, the phrase is: *These costs are related to the fact that you have customers.* For every customer you have, you incur one increment, or "share," of this cost type.

- The other part of the minimum charge is a surcharge intended to recover all or part of excess 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.* The surcharges calculated for each meter size are added to the base minimum charge to arrive at the surcharged minimum charge.

With this structure, the smallest meter size customers end up paying the lowest minimum charge. As meter size goes up, a larger capacity surcharge is added to the base minimum charge resulting in ever higher total minimum charges for larger meter size customers. Remember: It's not just how much water such customers use that determines how much they cost the utility. It's how big and robust they cause the utility to be built, because it has to be built robust enough to handle their maximum demand should they someday draw it. (For sewer systems, water meter size is also a good indicator of peak flow capacity. Unless a sewer customer has on-site water storage, or has serious inflow and infiltration, wastewater effluent discharge will occur almost immediately after the water flows through the water meter and it will be only the amount that flowed through the water meter.)

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 actually use. There are three main unit charge structures that I recommend in different situations:

- 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 utilities that are bumping up against their capacity to produce water.
- 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, everyone is assessed unit charges at the average unit cost. 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. I like to tell most of my clients that if they 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 water and almost all sewer service is assessed using level unit charges.

The City currently assesses very aggressive declining rates. I recommend you switch to a minimum charge plus a level unit charge rate structure.

- The last major unit charge structure, which the City currently uses, 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 a high concentration of high water using industry or in an area where folks want to attract such users.

To complicate the aforesaid just a bit, rate setting is, indeed, 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), refurbishment and replacement; 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 take into account 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 model 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 system development fees are assessed, the utility’s other charges can be lower. Such modeling enables me to do dynamic “what-if” scenario calculations. That enables me to arrive quickly at the “best fit” rates for the utility.

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 larger utilities 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.

Coincidentally, such a dynamic model makes it easy to calculate rate and other changes over the next two or three years, too. Consider this example:

- I made the assumption that the City will not get any grants to help the City fund some improvements. Fast forward a year or two from now. At that time, you are informed that you WILL get a grant. Thus, you would not need to loan finance the entire amount after all. It is a simple matter for me to go back to the original model, change the grant and loan ratios and re-run new rates. Then I can apply the inflationary rate increase factor to bring all rates and fees forward to the then current year and those will be the rates you need to adopt to pay for the new funding scenario.

As long as a change does not affect the cost structure drastically, I can do the same for almost any other change. That may be helpful to you as time goes by.

Two final thoughts on this topic:

- Almost always, rate adjustments include bill increases. Thus, time is money, often very 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.
- You will get complaints about customers' bills going up. 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 the current rates are unfairly structured.

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. As you read the report and model, keep in mind that my recommendations have been weighed against these principles:

1. Water, sewer and all other utilities are businesses, regardless of who owns them. Businesses must cash flow properly. Otherwise, they go out of business and your customers do not want that.
2. In addition to functioning in a business-like manner, a utility has a responsibility to its customers to strive to guarantee its long-term prosperity for their benefit. The customers expect the service to be there whenever they want to use it. Thus, a utility must err on the conservative side by building and maintaining strong reserves that will enable it to weather financial storms.

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 by paying commensurate system development fees. Likewise, service users should pay for what they use. Each user or class of users should pay their fair share of service costs.
4. Sometimes contradicting point 3 above, if adjusting a rate, fee or policy will turn currently "good" customers into "bad" customers, or discourage development that the community desires, consider the necessity of the change carefully before making 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 actually 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 forces existing customers to pay all the costs of the utility rather than sharing them with new customers.

General Issues

Concerning construction of the Model, it was built to match the system's actual financial statements as much as possible. However, the intent of rate modeling is to see to it that the resulting rates are adequate to pay all system expenses for the next ten years, build and maintain responsible reserves and collect fees from customers on a fair basis. Because incomes and expenses in your financial statements were not always grouped in such a way as to enable the required rate calculation methodology, the Model do not always match your 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 fund, etc. Therefore, the Model accounts for funds in a more simplified way than you probably will. When it comes to segregating funds, staff knows best how to do that, so the Model does little in this regard and leave 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 **recommended** 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 the Model 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 decide to keep your current rates. If either line is headed down toward zero, that is a very bad thing that needs to change by reducing costs, if you prudently can, or increasing rates.

In contrast to Chart 8, Charts 3 and 4 in the Model depict user rates. When the Chart 3 and 4 blue lines go up, meaning rates are going up, customers don't like that. But, the utility will be better funded as a result of those higher rates and that benefits ratepayers because it makes their utility more resilient and able to make improvements that will serve them better.

One thing you will notice in viewing the charts in the Model is this. Sometimes, only one of the lines shows up. When that occurs, it means that all the lines are taking the same path (one line is covering up the others). For example, sometimes Chart 5 shows only one line – the working capital goal amount. When that happens both the current rates and the modeled rates' net revenues are adequate to satisfy the goal, so those two lines are hidden by the line for 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. When that happens, rest assured, the other two lines are underneath the goal line and that is a good thing.

Charts 6 and 7 can do the same thing, making it seem like the current rates are "just as good as" the modeled rates. But, Chart 8 will spell the difference between the two sets of rates. The Modeled rates will generate more revenue and, thus, produce stronger total reserves. Since the working capital reserve gets truncated at a certain level, the differences in the total reserves show up in the CIP and Debt Service fund balances. These balances appear near the bottom of Table 6, page 38, and they are included in the Chart 8 amounts on the last page.

As you set and later reset rates I suggest you follow the guidance I give in my book, "How to Get Great Rates." I gave a copy to Connie Hargis so check with her about reviewing it. You may also want to consider using the "Replacement Scheduler[®]" spreadsheet for future equipment replacement scheduling. Send me an e-mail request and I will e-mail one to you.

Action Recommendations for Policy and General Issues

Use the following as a checklist of "to-do" tasks. Many if not all these things you are already doing but they bear repeating:

1. The City owns and manages several kinds of utilities. Only the water utility is covered by this report. The way you should think of the utilities' funds is this. There are different utilities. Each needs to make sure its own management, operations, CIP, R&R, financial tracking, rate setting, billing, etc. are taken care of. It just so happens that all of them "hired" the City to do all those functions for them. That means that the City should do all management and financial tracking functions for the utility in a compartmentalized way and be "paid" for providing those services to the utility. You have one set of staff that serves all the utilities. You have one accounting program with which you do accounting for all the utilities. You have one billing program that tabulates volume usage and calculates bills for customers of each utility, and so on. Each of these kinds of costs should be divvied out fairly to each utility. That can be done as follows.
 - a. For each administration-type cost category, sum up its total annual cost. Then, proportionately assess that cost category (usually by proportion of bill count) to each utility.

- b. However, some costs, like debt service incurred on behalf of a certain utility, are directly attributable to that utility. Pass them directly to that utility. Of course, City staff spend time paying that debt, managing and tracking the account and so on. Those costs should also be attributed directly to the subject utility.
 - c. In a similar way, incomes of all kinds should be “credited” to the utility that generated them. For example, rental is paid by a cell phone company to place a cell phone repeater on a water tower. That rental income may be paid to the City at-large, but it should be credited to the water utility “account.” User charge fees, system development fees (tap-on fees) and all other fees and charges should be credited to the subject account.
2. Periodically determine how long, on average, it takes to perform the various services you provide in the field, such as after-hours service, meter disconnects and reconnects, special meter readings, etc. Be sure to include all the time you actually pay staff for performing these services. Then determine how much it costs the utility per hour, on average, to have staff perform these services. This includes benefits, taxes, use of utility vehicles, tools and minor equipment, etc. It should also include a fair amount to cover the time that office staff devotes to working on these services to track them, bill for them, etc. This should be the hourly rate or a set fee you will charge for these services. In addition, set a minimum that you will charge for showing up, whether the service takes an hour to perform or 10 minutes. 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 functions is important, do not make the process burdensome. For many functions you likely can just estimate your 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 conduct a full rate analysis again when the actual financial performance and my projection of future performance for the utility dramatically diverges. Conditions should dictate rate analysis frequency.
5. Fully adopt management strategies that are included in what is most commonly called, “advanced asset management.” These strategies can yield better service and reduced costs for utilities, especially those looking to build new facilities or replace existing facilities soon, which is a critical issue for your utilities.
6. Track volume usage, incomes and expenses on a regular basis, segregating them by utility, so the data and information you generate will support future rate analyses.
7. As a reminder, check with your attorney for language and legality of all charges and issues discussed.

Rate Setting Issues

Making Rate Adjustments to Account for Future Unknown Expenses

Costs will change in the future. They will generally go up with inflation. The Model assumed a set of costs, including CIP and R&R costs, for the next ten years. If those assumptions turn out to be fairly accurate, you should adopt future inflationary-style across-the-board increases as described later in this report.

However, CIP and R&R costs can be quite large, vary dramatically and occur with little lead time. Following is a description of how to deal with that situation.

Because CIP and R&R costs can vary dramatically, we prepared a “what-if” scenario that assumed CIP would be \$1,000,000 more expensive than assumed in the Model. From that, we were able to determine how much you would need to increase the minimum and unit charge rates by to account for this cost increase. Table A shows those fee increases.

Table A: Rate Adjustments to Account for Higher CIP Costs

Table A: To Account for a CIP Cost Increase of \$1,000,000, Increase the Then Existing Rates by These Amounts.		
Increase Minimum Charge by:	Increase Unit Charge by:	Increase Snow Bird Fee by:
\$0.62	\$0.15	\$0.53
Notes:		
For a cost increase of less than \$1,000,000, calculate the percentage of \$1,000,000 that increase amounts to and reduce the above adjustments accordingly.		
For out of City rate adjustments, increase the above adjustments by the out of City factor of 50%.		

In reference to Table A, if CIP costs were going to be half the assumed increase – at \$500,000 – you would halve the increases in the table. Costs could go higher, too, but I believe it would be risky to adjust rates higher for total cost increases that exceeded \$1,500,000. If that circumstance arises, I suggest you call me to discuss the situation. I probably can adjust the original model to arrive at the appropriate rates more accurately.

The Model assumed CIP project costs would be paid for with a SRF loan

over 20 years at 2.0 percent interest. The difference between the assumed \$3,000,000 project cost and a \$4,000,000 project cost, on an annual loan payment or cost basis, would be \$62,686.

Therefore, you could also make these rate adjustments based on the annual cost increase rather than a CIP project cost increase.

Of course, in future years you will need to do inflationary-style increases, as well. To accomplish that and the CIP-related increases during a year when both need to be done, calculate the inflationary increases first. Then, add the above increases to the resulting rates, or whatever portion of these increases that are needed.

Payment in Lieu of Taxes

The City itself incurs costs in support of the utility. The City recovers some of those costs from the utility in the form of numerous "Water Council..." costs. But, there are other, unenumerated costs, too. The City desires to recover those through a common vehicle, called in the Model, "Payment in Lieu of Taxes." Figured at six percent of water sales from the previous year, this dollar amount should be transferred to the City.

Debt, System Development Fees and Capacity Surcharges

As shown in Table 5, page 37, I assumed you would build a new water treatment plant and loan fund its cost, thus acquiring new debt repayment costs. To pay for part of the coming CIP and debt costs, and on-going replacement of systems and components, I assumed you would assess and collect system development fees and minimum charge surcharges. These fees should be based upon water meter size, as further described in the following:

1. You should assess system development fees that recover as much of the peak capacity costs as possible, but at the same time they should be at least somewhat competitive with system development fees of nearby, similar utilities. (In your case, the latter is probably controlling so I calculated your system development fees so that the fee for five-eighths and three-quarter inch water meters, the most common residential meter sizes, would be the same as the current new connection fees. (That means, no change for most new connections.)
2. Larger meter sizes would be assessed higher system development fees based upon the maximum sustainable flow rate of each meter as determined by flow studies done by the American Water Works Association.
3. Assess out of City connections 50 percent more in capacity costs than in-City new connections. Table 12, page 50, reflects that difference.

System Development Fees

In this report and elsewhere, you will see the terms "tap fee," "tap-on fee" and "connection charges." There are other names for these and similar fees. I call them, "system development fees."

Most small systems set such fees anecdotally, and almost always too low, as well. They almost never attempt to recover the full cost of the infrastructure capacity they dedicate to each customer when they authorize them to "tap on." Rarely do they even have much of an idea what that capacity costs.

Failing to assess development costs to development is a problem because with each dedication of capacity to customers, the capacity of the utility gets "used up." That hastens the day when new capacity must be built. If that capacity cost is not assessed to those who cause it, it will be assessed by default to all customers. That forces existing customers to subsidize development, and that is a rate structure fairness issue.

I recommend you handle system development costs with a combination of system development fees and surcharges to minimum charges based upon meter size. **And, in your ordinances and elsewhere: call new connection charges by the name, "system development fees."** This descriptively tells developers and new customers what they are paying for. It is not just an arbitrary fee. They are actually buying something of great value. Then, **assess as much of the full cost of system development as you can and still be competitive with comparable systems.**

Later in this report when you see "tap-on fee" and those other terms, think, "system development fee." And when you talk with customers and others about this fee, make sure they know this is not just "government assessing another kind of tax." This is a utility having customers fairly pay for what they are buying – capacity to serve them.

4. Revenue generation is one reason for assessing system development fees. But the important reason for moving closer to full-cost system development fees is to charge each new customer or developer proportionately for what they get from the utility. That is capacity to serve the property. That is related to the size of the meter. In addition, you should be *seen* by all ratepayers as attempting to recover costs from each based upon the costs that each causes the utility to incur.

The Model calculated system development fees from the smallest customer meter to a 10-inch meter. While only a small part of the costs to develop and redevelop the system will be recovered by system development fees and surcharges, I recommend you adopt this set of fees and, as a matter of policy, you should let the standard fees for all meter sizes below a chosen size be controlling. In other words, let City staff handle the “retail stuff” of small meter new connections. I suggest that all connections with meters of two inches or less be paid for off the system development fees table of the utility. Almost all larger meter connections should be handled that way, as well.

However, the Board has the authority and should, when warranted, exercise its prerogative to accept (grant a variance for) new connections for some other system development fee amount and/or for other considerations offered by a potential new customer. Most commonly, the issue will be economic development and job creation by a new customer needing a large meter size. There can be City-wide benefits to allowing such new customers to build or expand in the service area that outweigh the possible loss in system development fee revenues. Job creation often causes growth in the customer base. Just be careful about giving too much in the hope that it will bring greater benefits to all other customers, and the City. Often, the discounting-for-economic-development strategy does not pan out.

I recommend you assess the same system development fee to five-eighths and three-quarter inch meters because these are the most common meter sizes for residential customers in most systems and almost all these meters are in use by residential customers. Setting the same system development fee for these meter sizes will simplify administration of the system development fee program. To make minimum charges consistent with the system development fee structure, you should assess the same minimum charge for these meter sizes, as well.

Equipment Repair and Replacement

Equipment repair and replacement (R&R) costs were not sent to me as a separate set of costs. I suspect R&R is simply handled on an annual, as-needed basis during the budgeting process. Lacking specific R&R scheduling and funding data, I assumed R&R annual costs will average 15 percent of operating costs, as shown in Table 6, page 38. That is a common rate for R&R for water and sewer systems with a few decades of age on them.

The annual annuity, or annual deposit amount needed to fund the R&R schedule, is calculated in Table 7, page 39.

However, if you build a new water treatment plant and replace many components of the current plant that need to be replaced right now, your R&R costs may actually go down, at least for several years. If that occurs, you could use the process in the subsection above called, “Making Rate Adjustments to Account for Future Unknown Expenses” to reduce rates proportionately. My recommendation, however, is that you not decrease rates. Instead, slow down future rate increases and allow inflation to “eat away” at your reserves until they are back down to the recommended level. I suspect neither action will be needed. Usually, when a system has no formal R&R schedule, it also does not repair and replace equipment as rapidly or as well as it should. Once you have the funds to do complete R&R, I suspect you will do complete R&R.

Recommended Rate Structure

The City currently assesses a remarkably low “service charge;” what most people call a minimum charge. In fact, I must go back to my SRF loan administrator days with the State of Missouri, around 1992, to have seen minimum charges that even approached how low yours are. In the interest of rate structure fairness, adequacy of utility funding and dependability of revenues, the minimum charges need to go up drastically.

I recommend surcharges to the base minimum charge to recover some capacity costs. Those surcharges should be based on water meter size.

You assess unit charges in a declining rate structure. I recommend unit charges in situations like yours be on a level basis, so they will recover variable costs on an average cost basis. That means rates for low volumes of use will be lower and rates for high volumes of use will be higher.

These structure changes will result in quite different bill changes depending upon each customer’s use of the system and the meter size that serves them. Table 15, page 53, shows the effects of such changes, excluding the effect of meter size-based surcharges.

Special Customer Sales

The City sells water on a wholesale basis to a water district, a couple of small towns and the Higginsville Habitation Center. It may now, or it may in the future, sell water on such a basis to other wholesale customers, too.

If special supply agreements dictate how such water sales are priced, contact me for special pricing calculations for those. Otherwise, I recommend you change these rates to a marginal cost plus profit margin basis. I will explain that.

In Table 8, page 40, I classified the overall cost structure of the water system. This calculation determined the average base minimum charge and the average unit charge, with no usage allowance.

In Table 9, page 42, I reclassified those same costs on a marginal cost basis. (Please refer to the definition of marginal costs in the Definitions section of the Model.)

Stated simply, marginal cost just means, as compared to the average of all customers, the special customers cause the utility to incur each category of variable costs at the same (100 percent) rate, or at some lower rate. (This only applies to variable costs – unit charges – because the minimum charges are calculated on a different basis, as already described.) I then totaled up the marginal variable costs in the right-most column of Table 9 and calculated the overall ratio (percentage) of marginal costs compared to the average variable cost. That percentage shows in the bottom right corner of Table 9, page 42. That percentage is then used for calculating the special customers' unit charge in Table 10, page 44.

In Table 10, I calculated the base minimum charge for all customers. I also calculated the unit charge for each customer class. The unit charge for special customers, called, "PWSD, Towns, Hig Hab (18, 19, 20)" and "Wholesale (5, 7, 8 10, 11)" in Table 10 and elsewhere, were priced this way:

- First, the unit charge for "In City Residential (16 & 9)" customers was calculated.
- The special customers' base unit charge was calculated at 60 percent of the In City... unit charge, finally,
- The special customers' unit charge was increased by 25 percent to allow for a marginal cost "profit."

Many will ask, "Why should the water utility make a "profit" on water sales to these customers.

From all other customers the water utility recovers its costs plus additional sums to pay for CIP and to build adequate reserves. The last two "costs" are somewhat analogous to making a "profit."

However, the special customers' variable costs were calculated at the break-even level. If that price was set at one penny less, the water utility would lose money on those sales. To guard against losing money, the utility should aim at making a profit on a marginal cost basis. Even with this profit margin, the unit charge for special customers will still be 25 percent lower than the rate for regular customers.

Rural Customer Sales

Pricing for "rural," or out of City customers should be done somewhat like the special customers, as described above.

There is at least an implied obligation on the part of the City to supply water to in-City properties. When water is made available to such properties, those property owners are also obligated to pay for at least the capacity costs the City incurred on their behalf to build the water system, even if they do not use the system. And, in-City properties are subject to Ad Valorem taxes that could be authorized to pay for water system construction and improvements. These are significant obligations that in-City customers cannot escape.

The relationship between out of City property owners and the City is different. Out of City properties are not obligated to hook up to the City's water system. And, the City is not obligated to serve out of City customers. Aside from specific State laws that govern such sales, the relationship between the City and out of City customers is, essentially, the "willing seller and willing buyer" relationship. The parties come together and agree upon service to be rendered and a price for that service.

The City's primary obligation is to serve its in-City customers well. It would not serve them well if the City sold water to out of City customers below cost. That would shift costs to the in-City customers. (Generally, it costs more to serve out of City customers than in-City customers.) It would serve in-City customers well if water sales outside of the City made a "profit." In Missouri and elsewhere around the U.S., I find this profit margin to range from 10 percent on the low side to 200 percent on the high side for out of City sales versus in-City retail sales.

Higginsville currently assesses a premium of 50 percent for out of City, or "rural" sales. I find that premium to be quite common and I consider it to be reasonable. Therefore, I recommend you continue that premium and I modeled it that way.

"No Charge" Customers

There is a class of customers called, "No Charge." They get free water. I have been told the water utility itself is this class of customers, using water in the process of maintaining the water system. No charge for such water use is the normal practice.

Other City Water Use

Other City buildings and other facilities get water at \$1.00 per 100 cubic feet, with no minimum charge. That rate seems arbitrary to me. And, it seems that the City, other than for system maintenance, should pay for water at no less than the marginal cost, plus 25 percent profit rate that similar customer would pay. Therefore, I modeled such use at the wholesale rate.

"Bulk Sales"

The City has a fill station for those who bring their own container or tank to purchase water. These are "bulk sales." The fill station "cash register" is a vending machine system. City staff have told me that the vending machine is very old and may not have the capability of being recalibrated, to allow volume dispensed, or the price charged to be adjusted.

If the vending machine can be adjusted, I recommend that bulk sales be priced higher by the same overall initial rate increase I calculated for all customers. That is 20.6 percent, as shown at the top of Table 15, page 53. You can achieve that repricing by either reducing the volume dispensed by 20.6 percent and keep the price increments the same. Or, you can do it by increasing the minimum and unit charge prices for the same volumes by 20.6 percent. I suggest you round to the nearest gallon or tens of gallons, or to the nearest quarter, respectively.

If the vending machine will not accept repricing or recalibration, leave it as-is. You sell very little bulk water so whether you reprice that water or not, it will have no discernible effect on revenues.

“Snow Bird” Billing

If you have no, or only a few “snow birds,” you can ignore this subsection. Otherwise, consider this approach with snow birds.

Some customers, commonly called “snow birds,” only live in an area for part of the year. It is common for such customers to discontinue water and other services while they are gone, if you allow them to. That eliminates their water bills during their time away, which is good for them. However, that is not good for full-year customers because they end up paying the unavoidable fixed costs for snow birds while the snow birds are away.

While it is true that snow birds are not using any volume during their time away, they still cause the City to incur various fixed and capacity-related costs. Prominent among these are the costs of debt service paid to build system capacity to serve them and the cost of basic administration and maintenance required to keep the systems in working order so when these customers return there will be water and sewer service available for them to resume using.

The analogy of home mortgage payments and property taxes applies to a utility’s unavoidable fixed costs. The banker and the county do not forgive debt and taxes during the time the homeowner is not in the house. Neither should the City forgive its unavoidable fixed and capital costs while the customer is away.

Many systems require snow birds to continue paying the full minimum charge. If that is your policy and you want to continue that way, you need not read the rest of this subsection. Otherwise, continue.

In my view assessing the full minimum charge to snow birds is excessive because snow birds do not cause the system to incur a full share of fixed costs while they are away; only the unavoidable fixed costs.

Therefore, I recommend the City assess relevant fixed costs to snow birds as a capacity maintenance fee, which will be only part of the minimum charge. That fee was calculated as follows.

In Table 8, page 40, I establish the base fixed cost for all customers. That is done in the “Fixed Cost Percentage” column. The resulting dollar amounts are shown in the “Average Fixed Cost” column. I arrive at the “Average Fixed Cost per User per Month During Basis Year” in the bottom left corner of that table by summing these costs and dividing by the number of bills sent during the year. This is the “starting place” for calculating the base minimum charge for each customer.

In Table 9, page 42, I establish the degree by which snow birds share in each fixed cost category. (Snow birds use no volume while they are away so the “Marginal Variable Cost” calculations in this table do not apply to them. They apply to water districts and wholesale customers.) That is done in the “Marginal Fixed Cost Percentage” column. As was done in Table 8, I arrive at the “Marginal Fixed Cost” at the bottom of Table 9, by summing these costs and dividing by the number of bills sent during the year. This is the “starting place” for calculating the base snow bird fee.

As the modeled base minimum charge rises or falls compared to its “starting place,” the base snow bird fee is also increased or decreased, staying in the same ratio to the base minimum charge.

Finally, there are capacity costs to recover. Capacity costs arise simply because a customer is connected to the system. It does not matter whether the customer is there using the service or not, or how much volume they use, capacity has been dedicated to that service connection. That capacity allocation costs money. Therefore, snow birds need to pay a full share of those costs. That is done in Table 13, page 51, by adding to the base snow bird fee the relevant amount from the “Final Capacity Cost per Meter per Billing Period” column for each meter size. The resulting snow bird fee for each meter size shows in the last column of Table 13.

These calculations are complex and hard to follow. The important point is this. Snow birds cause certain fixed costs to occur. They also cause a full share of capacity costs to occur. In fairness, snow birds should pay for these costs.

You have choices about how to recover costs incurred on behalf of snow birds.

If a snow bird simply goes away and returns but does not notify you that they will be away, they simply have not identified themselves as snow birds. Thus, their account would remain in active status and they would continue to be billed like usual. Almost all snow birds handle their utility accounts in this way.

But, if a snow bird notifies you they will be away, you can offer them this billing service:

- You can disconnect their meter, for which they would pay a disconnect fee, and place their account in “snow bird” status while they are gone.
- They would be assessed the appropriate snow bird fee each billing period and pay that fee, if they give you the address to which you would send their snow bird bills. Otherwise, if you allow this option, their bills would accrue until they return.
- When they return, you would reconnect their meter, assess the meter reconnection fee plus all accrued bills and resume billing them as an active customer.

Unless water line freeze-up is a concern, I suspect the simplest and cheapest alternative for most customers would be to remain in active customer status. For small meter customers, the minimum charge is only slightly higher than the snow bird fee. But by remaining in active status, they would avoid the cost of meter disconnection and reconnection and come out ahead if they are not gone for long. This status also makes billing and administration simpler because City staff would not have to change the customer's status in the billing program, disconnect their meter and reconnect it again when they return.

Target Reserve Levels

Your current utility reserves are far below the target reserves based on your current level of costs. And, many costs will rise markedly soon so reserves need to go up to match. Fortunately, you can do that gradually over the next ten years.

Most systems serving fewer than 5,000 connections, including yours, should have reserves at least as high as the sum of the following:

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. I recommend 35 percent in your case, as well;
2. A 20-year repair and replacement (R&R) schedule reserve, in the 20th year equal to at least one average year's cost of R&R. In your case, you do not have detailed R&R schedules, so I assumed annual R&R costs at 15 percent of annual operating costs, excluding debt service and general administration costs; and
3. Capital improvement reserves at the end of the tenth year, after debt is paid, equal to that year's debt payments.

I modeled the utility's rates to generate slightly more than these reserve levels ten years from now. The lines on the bottom of Table 14, page 52, and several of the charts at the end of the Model show your reserve balances expected for the next ten years. The last line of Table 14, the "Sum of All Reserves," is the critical one. By the seventh year you should exceed the targeted reserves level goal for the utility and stay above the goal through the tenth year.

A caution: Projecting budgets and ending balances for next year is difficult. 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. What 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 bring you back on course.

A Technical Note About How Reserves Are Shown in the Model

In Table 14, you will see some negative reserves. Here's why.

The repair and replacement reserve, which covers replacement of rolling stock, pumps, motors, water tower repaints and the like, will be negative for a few years. That is because (I assumed) no starting balance for such a reserve and the cost of doing replacements will be greater than the annual payment into these reserves during the early years. Thus, the repair and replacement reserves will be in the "red" for a few years but then go positive. Do not be alarmed. Other system reserves are ample to cover these temporary shortfalls.

The take-away is this. The "Sum of All Reserves" at the bottom of Table 14, is the key balance to track. That balance will remain positive and grow strong in a few years.

Rate Affordability

Rate affordability, often measured by the Affordability Index, is an important indicator to which you should pay attention.

In Table 14, near the top, I show the estimated Affordability Index for the current rates in the first column and the modeled rates in the following columns. The same thing is shown graphically in Chart 4 of the Model.

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 a primary factor in determining grant and loan eligibility and grant amount.

A major use of the Affordability Index is qualification for needs-based grants. From my analysis, it appears needs-based grants are probably not an option for the water system unless a small part of the City (a low-income area) could qualify for a grant.

In rate affordability terms, the Affordability Index will go up slightly with the initial rate adjustments. As time passes and you make inflationary increases, those increases will be slightly less than the increase in incomes, so rates will become ever so slightly more affordable over time.

The affordability index is useful, but it does not depict how new rates will affect customers using different volumes or the rates to be assessed for different water meter sizes. Table 15, page 53, shows how certain customers' bills at different volumes of use will be affected by the recommended rates. This table should give ratepayers a good idea of what will happen to their bills. This table is one of the few from of the Model that I recommend you copy and bring to the Board meeting(s) where you or we discuss rates. Because most customers are concerned about what will happen to their bills, you should give this table to everyone who wants a copy.

Recommendations for Adjusting Water Rates

The Model contains all my rates-related recommendations and shows what they are built upon. However, the Model is complex, plus it does not cover policy issues. Therefore, I have summarized most of my recommendations as follows:

1. You should assess the system development fees, monthly minimum charges, unit charge and snow bird charges shown in Table B, that follows this list.
2. As to system development fees:
 - a) I recommend that almost all new connections, especially all those made with water meters two inches in diameter or less, be paid for at the rates included in the new system development fee rate table you will adopt. Ideally, larger meter system development fees would be paid for in that way, too. However, the Board retains the authority to waive the standard system development fee or adjust that charge for certain larger meter size customers that, due to other offsetting values they would bring to the service area (primarily economic development) that would substantially benefit the City and its customers.
 - b) Continue to bill for equipment and services that the City provides to facilitate making new connections. Call these whatever you want but be clear that these charges are separate from system development fees that pay for capacity dedicated to new customers.
3. The calculations assumed you would have made these adjustments early enough to enable you to collect at these rates for the July 1, 2018, billing. You would need to satisfy all Statutory requirements for making rate adjustments in advance of the adjustment date.
4. If you do not already do so, assess a late payment fee of \$10.00 or ten percent of the outstanding total bill amount owed to the City, whichever is greater, each month.
5. If balances do not accrue as rapidly as shown at the bottom of Table 14, page 52, follow the instructions in Chapter 9 of the book, "How to Get Great Rates" for how to make inflationary increases correctly.

Table B: Recommended Fees and Charges

Table B: City of Higginsville, Missouri, Water System Rates and Fees. Upper Section - In-City Customers. Lower Section - Special customers. Out of City Customers, Assess 50 Percent More for the Unit Charge.						
Water Meter Size in Inches	Meter Type	One-time System Development Fee	Minimum Charge per Month	Usage Allowance in Gallons	Unit Charge per 100 Cu. Ft.	Snow Bird Fee per Month
0.625	Displacement	\$550	\$13.87	0	\$3.57	\$11.84
0.750	Displacement	\$550	\$13.87	0	\$3.57	\$11.84
1.000	Displacement	\$1,150	\$15.73	0	\$3.57	\$13.71
1.500	Displacement	\$2,151	\$18.83	0	\$3.57	\$16.81
2.000	Displacement	\$3,351	\$22.56	0	\$3.57	\$20.53
2.500	Displacement	\$5,151	\$28.14	0	\$3.57	\$26.12
3.000	Singlet	\$6,552	\$32.49	0	\$3.57	\$30.46
3.000	Compound, Class I	\$6,552	\$32.49	0	\$3.57	\$30.46
3.000	Turbine, Class I	\$7,152	\$34.35	0	\$3.57	\$32.32
4.000	Singlet	\$10,153	\$43.66	0	\$3.57	\$41.63
4.000	Compound, Class I	\$10,153	\$43.66	0	\$3.57	\$41.63
4.000	Turbine, Class I	\$12,553	\$51.11	0	\$3.57	\$49.08
6.000	Singlet	\$20,155	\$74.69	0	\$3.57	\$72.67
6.000	Compound, Class I	\$20,155	\$74.69	0	\$3.57	\$72.67
6.000	Turbine, Class I	\$26,157	\$93.31	0	\$3.57	\$91.29
8.000	Compound, Class I	\$32,158	\$111.93	0	\$3.57	\$109.91
8.000	Turbine, Class I	\$56,164	\$186.41	0	\$3.57	\$184.38
10.000	Turbine, Class II	\$84,171	\$273.30	0	\$3.57	\$271.27
Special Customers						
Rural (4, 17) (Includes Out of City Surcharge)		Table 12	Table 13	0	\$5.36	Table 13
PWSD, Towns, Hig Hab (18, 19, 20) (Out of City Surcharge N.A.)		Table 12	Table 13	0	\$2.66	Table 13
Wholesale (5, 7, 8 10, 11) (In-City Unit Charge Listed Here, Out of City - 25 Percent More)		Table 12	Table 13	0	\$2.66	Table 13
Note: This section lists special customer unit charges. Other charges depend upon customer location and meter size. Refer to the noted tables for those.						

Closing

I recommend you adopt the rates calculated in the Model and shown in the table immediately above. Bill increases for low-volume customers are fairly large because the current minimum charge is markedly too low. The current structure is far from being in a cost-to-serve rate structure.

The rates I recommend are adequate and in a cost-to-serve structure, with the exception of an across-the-board \$12.50 per month minimum charge reduction to reduce the degree by which low-volume customers' bills would increase initially. These rates will enable you to build appropriately strong reserves, cover increasing costs, especially CIP, be prepared for contingencies and do so using a structure that is markedly fairer than the current structure.

As you address issues raised in this report and the analyses, you will have questions. Ask them. Our goal and measure of success is helping you set adequate and fairly structured rates. Until you are satisfied that you are "there" as solidly as you care to be, we will keep at it until that job is done.

At the beginning of the project, you elected to receive one on-site visit. On that visit, during a Board meeting, I will inform the Board and the public about my results and recommendations and answer questions. That will be a great opportunity for everyone to learn what this all means to them. Most will find that it's not that big a deal after all.

Consider the report carefully and when you are ready to move to the next steps, keep the following in mind.

Everyone impacted by new 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.
- Give the media the full report so they can quote it directly and accurately rather than be forced to "figure things out." There is a lot to figure out. Much of it is very complex. Few people know how to, or have the time to, calculate utility rates. Make it easy for everyone to get the information I produced.
- For most customers, what would happen to their bills is as much as they will care to know about the analysis. To satisfy those information needs, the City can publicize the current and recommended rates and/or the bill comparisons, likely on your Web site.
- A few customers will want to know more, especially high-volume customers. Give them the full report, if that is what they want.

The bottom line is this. Inform ratepayers and others about the rate analysis as much as they care to absorb. That will not make you or the new rates popular with most folks. But, they will at least appreciate that you are being transparent and that you went the extra mile to get them fully informed.

City of Higginsville, Missouri; Water Rates Scenario 2018-2

Rate Modeling Results With \$3,000,000 Water Plant Project

April 2, 2018

This rate analysis scenario was produced by
Carl E. Brown, GettingGreatRates.com
1014 Carousel Drive, Jefferson City, Missouri 65101
(573) 619-3411
www.gettinggreatrates.com
carl1@gettinggreatrates.com

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.

CBGreatRates© Version 7.7

Index of Tables and Charts

Note: When a numbered table or chart is not described below and it is missing from this model package, that was not a mistake. It simply means that

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 calculated and recommended in this model for each user class are on the left, the current rates are on the right
Table 2 - Test Year Usage	Compilation of actual volume of service used by customers during the test year
Table 3 - User Base 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 be adopted
Table 4 - Operating Costs and Net Income	Operating costs projected for 10 years
Table 5 - Capital Improvement Program (CIP)	Capital improvements and how they will be paid over next 10 years, including debt service
Table 6 - Equipment Replacement Schedule (R&R)	Detailed schedule of equipment replacements for next 20 years, if applicable
Table 7 - Equipment Replacement Annuity Calculation	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
Table 9 - Marginal Cost Classification	Calculation of costs incurred to serve a specified type of customer, if applicable
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 - Capacity Costs	Calculation of the various cost to build base and peak flow capacity to serve customers, if applicable
Table 11B - Safe Operating Capacities by Meter Size	This table calculates the meter equivalent ratio, which is used for calculating peak flow capacity-based system development fees and system development surcharges in Tables 12 and 13.
Table 12 - System Development Fees Based on Meter Size	Calculation of meter size-based system development fees (hook-up fees) to recover costs calculated in Table 11, if applicable
#REF!	Calculation of meter sized-based capacity surcharges (to the minimum charge) to recover costs calculated in Table 11, if applicable
Table 14 - 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 15 - Comparison of Bills Before and After Rate Adjustments	Bills at the modeled rates are compared to those under the current rates
Table 16 - User Statistics	For volume ranges within each rate class, this table shows volumes and percentages of use, revenue generated and other statistics
Chart 1 - Operating Ratio	<i>Graph of operating ratio for 10 years as a result of the modeled rates and the current rates</i>
Chart 2 - Coverage Ratio	<i>Graph of coverage ratios for 10 years of the modeled rates and the current rates</i>
Chart 3 - 5,000 Gallon Residential User's Bill	<i>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</i>
Chart 4 - Affordability Index	<i>Graph of the affordability index for 10 years of the benchmark residential user's bill (used in grant and loan eligibility determinations)</i>
Chart 5 - Working Capital vs Goal	<i>Graph for 10 years of total (unobligated) cash assets at modeled rates compared to the goal for total cash assets</i>
Chart 6 - Value of Cash Assets Before Inflation	<i>Graph for 10 years of unobligated cash assets NOT adjusted for inflation at modeled rates and current rates</i>
Chart 7 - Value of Cash Assets After Inflation	<i>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.</i>
Chart 8 - Sum of All Reserves	<i>Graph of all reserves of all kinds at the modeled rates and at the current rates</i>

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 initial 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."
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 <u>average</u> cost to produce. In a proportional to use rate structure, this is the unit charge. See "Cost Calculations" at the bottom of Chart 19.
Cost to Serve Rates	Rates where fixed and variable costs generated by each user class are paid by that class with minimum and unit charges, respectively. Similar to and sometimes the same as "proportional to use" rates.
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. Most systems should have a CR of 1.25 or higher.
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 is a good measure of overall financial health.
Declining Rates	Rates where unit charges go down as the volume used goes up
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)	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 EDU. All other types of customers are then compared on this measuring basis and the EDUs are calculated. Generally the purpose of this exercise is to calculate fees that each EDU must pay.
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 to meet reserve targets. Rate structure fairness is a small issue, if it is an issue at all. Such increases are usually small, in the two to five percent per year range.
Initial Rate Adjustments	Rate adjustments done in follow up 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.

Definitions

Life-cycle Cost	The total cost to design, build, operate, maintain and eventually dispose of 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.
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.
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 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 to return that investment through increased user and other fees
Potential Demand	The volume of service that a user could demand for a short period of time at full volume use. The potential demand limiting factor is usually the size of the customer's meter or service line.
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, 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.
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, to many thousands of dollars for a large industrial customer with capacity costs included. 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, which is usually the last completed fiscal year. See related "analysis year."
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. Does not system development charges, late payment penalties or other types of charges.
Water Loss	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.
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 of \$0 is "break even." Related to "current position."
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.

Return on Investment

City of Higginsville, Missouri; Water Rates Scenario 2018-2

The rates depicted in this model will produce various returns on investment or paybacks. Usually the most important payback, at least to ratepayers, is a rate structure that is demonstrably fair. For the system, however, making sure that revenue will be adequate to pay all expected, expectable and many unexpectable costs is the the most important return. If revenue will increase as a result of this analysis, which is almost always the case, one can calculate a dollar and percentage return on investment.

The following calculations show what was invested and what the returns will be over two periods; five years and 10 years. Five years is a reasonable period for return projections. Ten years is a good basic planning horizon but you should not bank on amounts or returns projected that far out. Besides, most systems should have their analyses redone long before then.

Consider these key points about return on investment. Higher rates will fund more improvements, better repair and replacement and more. Most increases in revenue end up being used for such expenses. Thus, few systems end up with a dramatic increase in their cash reserves but they do markedly improve their financial position. In addition, fairer and higher rates generally enable systems to qualify for grant and loan funding that they otherwise would not. That increases the importation of "other people's money," which is a drain on the state and federal funds, where the money comes from, but it is very desirable at the utility level. The calculation below ignores any "outside" funds the utility may capture.

Also note that rates in this model have been modeled to be adjusted during the year following the test year or even later. That year is included in the first five-year return on investment calculation. Thus, the first year of returns calculated below include most or all of one year where rates will not have been changed yet. Thus, the real rate of return will be greater than the calculation reflects.

Calculations

\$9,383 Fees to GettingGreatRates.com

\$500 Estimated value of system staff time and incidentals to assemble needed information

\$9,883 Total Investment for This Analysis

\$2,520,812 Five-year Increase in Revenue Due at Least Partly to This Analysis

25,507% Five-year Return on Investment (increase in revenues / investment)

\$6,779,778 Ten-year Improvement in Cash Position Due at Least Partly to This Analysis

68,600% Ten-year Return on Investment (increase in revenues / investment)

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Table 1 - Rates

City of Higginsville, Missouri; Water Rates Scenario 2018-2

Unless rates were recently changed, these are the current rates. At the least, these rates were in effect at the end of the test year. If 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

Customer Type, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Billing Cycle Minimum Charge	Usage Allowance in 100 Cu Ft	Unit Charge per 100 Cu Ft
In City Residential (16 & 9)	0	\$2.75	0.000	\$4.18
	2,500	\$2.75	0.000	\$4.18
	3,000	\$2.75	0.000	\$3.03
	50,000	\$2.75	0.000	\$3.03
	70,000	\$2.75	0.000	\$2.98
	2,000,000	\$2.75	0.000	\$2.98
In City Non Residential (1, 2, 3, 13, 14, 15, 21)	0	\$2.75	6.000	\$4.18
	2,500	\$2.75	6.000	\$4.18
	3,000	\$2.75	6.000	\$3.03
	50,000	\$2.75	6.000	\$3.03
	70,000	\$2.75	6.000	\$2.98
	2,000,000	\$2.75	6.000	\$2.98
City (6)	0	\$0.00	0.000	\$1.00
	2,000,000	\$0.00	0.000	\$1.00
No Charge (12)	0	\$0.00	0.000	\$0.00
	2,000,000	\$0.00	0.000	\$0.00
Rural (4, 17)	0	\$2.75	0.000	\$6.27
	2,500	\$2.75	0.000	\$6.27
	3,000	\$2.75	0.000	\$4.54
	50,000	\$2.75	0.000	\$4.54
	70,000	\$2.75	0.000	\$4.47
	2,000,000	\$2.75	0.000	\$4.47
PWSD, Towns, Hig Hab (18, 19, 20)	0	\$16.50	0.000	\$2.86
	500,000	\$16.50	0.000	\$2.86
	666,668	\$16.50	0.000	\$1.46
	700,000	\$16.50	0.000	\$1.46
	833,333	\$16.50	0.000	\$1.26
	2,000,000	\$16.50	0.000	\$1.26
Wholesale (5, 7, 8 10, 11)	0	\$2.75	0.000	\$2.86
	50,000	\$2.75	0.000	\$2.86
	70,000	\$2.75	0.000	\$1.46
	500,000	\$2.75	0.000	\$1.46
	666,668	\$2.75	0.000	\$1.26
	2,000,000	\$2.75	0.000	\$1.26

Table 2 - Test Year Usage
City of Higginsville, Missouri; Water Rates Scenario 2018-2

This table shows usage by all customers during the test year.				Residential meter readings per year: 12				Date this scenario created: 2/7/2018			
Test year = the one-year period being analyzed starts: 10/1/2016				Other customer meter readings per year: 12				Bills sent per year: 12			
Customer or Rate Class, or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Conversion Factor for Billable Units	Avg. Use in Each Volume Range in 100 Cu Ft in Each Range	Count of Bills With ANY Volume in Each Range	Total Annual Use in Each Volume Range in Cu Ft	Count of Bills Where Volume "Maxed Out" in Each Range	Volume of Bills Where Volume "Maxed Out" in Each Range	# of Customers With Volume That "Maxed Out" in Each Range	% of Customers Averaged This Volume of Use	% of Total Use at This Average Volume
In City Residential (16 & 9)	0	99	100	0.916	20,364	1,865,884	2,416	71,084	201	9.7%	5.8%
	100	199	100	0.931	17,948	1,670,327	2,373	350,127	198	9.5%	5.2%
	200	499	100	2.190	15,575	3,410,612	8,147	2,811,612	679	32.7%	10.6%
	500	799	100	1.853	7,428	1,376,684	4,791	2,981,084	399	19.2%	4.3%
	800	999	100	1.432	2,637	377,523	1,260	1,110,123	105	5.1%	1.2%
	1,000	1,499	100	2.798	1,377	385,277	940	1,106,777	78	3.8%	1.2%
	1,500	1,999	100	3.368	437	147,180	227	382,680	19	0.9%	0.5%
	2,000	2,499	100	3.611	210	75,837	97	213,337	8	0.4%	0.2%
	2,500	2,999	100	3.765	113	42,544	48	130,044	4	0.2%	0.1%
	3,000	4,999	100	11.475	65	74,590	45	169,590	4	0.2%	0.2%
	5,000	7,499	100	15.331	20	30,661	11	63,161	1	0.0%	0.1%
	7,500	9,999	100	20.744	9	18,670	2	16,170	0	0.0%	0.1%
	10,000	19,999	100	68.786	7	48,150	4	58,150	0	0.0%	0.2%
	20,000	29,999	100	52.633	3	15,790	2	45,790	0	0.0%	0.0%
	30,000	49,999	100	14.700	1	1,470	1	31,470	0	0.0%	0.0%
Monthly and Annual Subtotals:					66,194	9,541,199	20,364	9,541,199	1,697	81.7%	29.7%
In City Non Residential (1, 2, 3, 13, 14, 15, 21)	0	99	100	0.769	3,684	283,481	1,240	39,081	103	5.0%	0.9%
	100	199	100	0.881	2,444	215,308	496	70,108	41	2.0%	0.7%
	200	499	100	2.390	1,948	465,662	652	207,262	54	2.6%	1.5%
	500	799	100	2.596	1,296	336,491	308	194,091	26	1.2%	1.0%
	800	999	100	1.847	988	182,515	147	131,915	12	0.6%	0.6%
	1,000	1,499	100	4.267	841	358,882	211	254,882	18	0.8%	1.1%
	1,500	1,999	100	4.472	630	281,711	134	234,711	11	0.5%	0.9%
	2,000	2,499	100	4.495	496	222,966	100	224,966	8	0.4%	0.7%
	2,500	2,999	100	4.632	396	183,420	59	162,420	5	0.2%	0.6%
	3,000	4,999	100	15.846	337	534,006	118	450,006	10	0.5%	1.7%
	5,000	7,499	100	20.878	219	457,231	64	389,731	5	0.3%	1.4%
	7,500	9,999	100	21.758	155	337,256	44	389,756	4	0.2%	1.1%
	10,000	19,999	100	60.290	111	669,216	70	959,216	6	0.3%	2.1%
	20,000	29,999	100	75.680	41	310,289	14	320,289	1	0.1%	1.0%
	30,000	49,999	100	161.974	27	437,329	10	397,329	1	0.0%	1.4%
	50,000	69,999	100	182.300	17	309,910	4	249,910	0	0.0%	1.0%
	70,000	99,999	100	297.046	13	386,160	1	96,160	0	0.0%	1.2%
	100,000	299,999	100	626.067	12	751,280	12	1,951,280	1	0.0%	2.3%
Monthly and Annual Subtotals:					13,655	6,723,113	3,684	6,723,113	307	14.8%	21.0%

Table 2 - Test Year Usage

Customer or Rate Class, or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Conversion Factor for Billable Units	Avg Use in Each Volume Range in 100 Cu Ft in Each Range	Count of Bills With ANY Volume Range in Each Range	Total Annual Use in Each Volume Range in Cu Ft	Count of Bills Where Volume "Maxed Out" in Each Range	Volume of Bills Where Volume "Maxed Out" in Each Range	# of Customers With Volume That "Maxed Out" in Each Range	% of Customers Averaged This Volume of Use	% of Total Use at This Average Volume
City (6)	0	99	100	0.516	228	11,770	135	2,470	11	0.5%	0.0%
	100	199	100	0.857	93	7,968	23	3,268	2	0.1%	0.0%
	200	499	100	2.023	70	14,162	35	10,662	3	0.1%	0.0%
	500	799	100	2.483	35	8,692	14	9,392	1	0.1%	0.0%
	800	999	100	1.843	21	3,870	2	1,670	0	0.0%	0.0%
	1,000	1,499	100	4.479	19	8,510	3	3,510	0	0.0%	0.0%
	1,500	1,999	100	4.775	16	7,640	1	1,640	0	0.0%	0.0%
	2,000	2,499	100	5.000	15	7,500	0	0	0	0.0%	0.0%
	2,500	2,999	100	4.467	15	6,700	3	8,200	0	0.0%	0.0%
	3,000	4,999	100	19.242	12	23,090	4	19,090	0	0.0%	0.1%
	5,000	7,499	100	12.350	8	9,880	7	42,380	1	0.0%	0.0%
	7,500	9,999	100	25.000	1	2,500	0	0	0	0.0%	0.0%
	10,000	19,999	100	100.000	1	10,000	0	0	0	0.0%	0.0%
	20,000	29,999	100	38.300	1	3,830	1	23,830	0	0.0%	0.0%
Monthly and Annual Subtotals:					535	126,112	228	126,112	19	0.9%	0.4%
No Charge (12)	0	99	100	0.844	36	3,040	6	40	1	0.0%	0.0%
	100	199	100	0.990	30	2,970	1	170	0	0.0%	0.0%
	200	499	100	2.452	29	7,110	11	3,910	1	0.0%	0.0%
	500	799	100	2.383	18	4,290	11	7,690	1	0.0%	0.0%
	800	999	100	0.829	7	580	6	5,180	1	0.0%	0.0%
	1,000	1,499	100	1.700	1	170	1	1,170	0	0.0%	0.0%
Monthly and Annual Subtotals:					121	18,160	36	18,160	3	0.1%	0.1%
Rural (4, 17)	0	99	100	0.867	456	39,540	72	1,140	6	0.3%	0.1%
	100	199	100	0.949	384	36,440	35	5,040	3	0.1%	0.1%
	200	499	100	2.254	349	78,666	157	52,466	13	0.6%	0.2%
	500	799	100	2.114	192	40,582	100	62,982	8	0.4%	0.1%
	800	999	100	1.677	92	15,432	27	24,032	2	0.1%	0.0%
	1,000	1,499	100	3.677	65	23,902	26	30,402	2	0.1%	0.1%
	1,500	1,999	100	4.446	39	17,340	9	15,840	1	0.0%	0.1%
	2,000	2,499	100	4.010	30	12,031	11	24,531	1	0.0%	0.0%
	2,500	2,999	100	4.283	19	8,137	6	16,637	1	0.0%	0.0%
	3,000	4,999	100	11.474	13	14,916	9	33,916	1	0.0%	0.0%
	5,000	7,499	100	21.575	4	8,630	1	6,130	0	0.0%	0.0%
	7,500	9,999	100	25.000	3	7,500	0	0	0	0.0%	0.0%
	10,000	19,999	100	30.867	3	9,260	3	39,260	0	0.0%	0.0%
Monthly and Annual Subtotals:					1,649	312,376	456	312,376	38	1.8%	1.0%

Table 2 - Test Year Usage

Customer or Rate Class, or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Conversion Factor for Billable Units	Avg. Use in Each Volume Range in 100 Cu Ft in Each Range	Count of Bills With ANY Volume in Each Range	Total Annual Use in Each Volume Range in Cu Ft	Count of Bills Where Volume		# of Customers With Volume That "Maxed Out" in Each Range	% of Customers Averaged This Volume of Use	% of Total Use at This Average Volume
							"Maxed Out" in Each Range	"Maxed Out" in Each Range			
PWSD, Towns, Hig Hab (18, 19, 20)	0	99	100	0.125	96	1,200	84	0	7	0.3%	0.0%
	100	199	100	1.000	12	1,200	0	0	0	0.0%	0.0%
	200	499	100	3.000	12	3,600	0	0	0	0.0%	0.0%
	500	799	100	3.000	12	3,600	0	0	0	0.0%	0.0%
	800	999	100	2.000	12	2,400	0	0	0	0.0%	0.0%
	1,000	1,499	100	5.000	12	6,000	0	0	0	0.0%	0.0%
	1,500	1,999	100	5.000	12	6,000	0	0	0	0.0%	0.0%
	2,000	2,499	100	5.000	12	6,000	0	0	0	0.0%	0.0%
	2,500	2,999	100	5.000	12	6,000	0	0	0	0.0%	0.0%
	3,000	4,999	100	20.000	12	24,000	0	0	0	0.0%	0.1%
	5,000	7,499	100	25.000	12	30,000	0	0	0	0.0%	0.1%
	7,500	9,999	100	25.000	12	30,000	0	0	0	0.0%	0.1%
	10,000	19,999	100	100.000	12	120,000	0	0	0	0.0%	0.4%
	20,000	29,999	100	100.000	12	120,000	0	0	0	0.0%	0.4%
	30,000	49,999	100	200.000	12	240,000	0	0	0	0.0%	0.7%
	50,000	69,999	100	200.000	12	240,000	0	0	0	0.0%	0.7%
	70,000	99,999	100	300.000	12	360,000	0	0	0	0.0%	1.1%
	100,000	299,999	100	2,000.000	12	2,400,000	0	0	0	0.0%	7.5%
	300,000	499,999	100	2,000.000	12	2,400,000	0	0	0	0.0%	7.5%
	500,000	666,667	100	1,666.678	12	2,000,014	0	0	0	0.0%	6.2%
	666,668	699,999	100	305.026	12	366,031	2	1,366,045	0	0.0%	1.1%
	700,000	833,332	100	1,051.113	10	1,051,113	4	3,051,115	0	0.0%	3.3%
	833,333	899,999	100	475.553	6	285,332	4	3,485,330	0	0.0%	0.9%
	900,000	1,099,999	100	924.100	2	184,820	2	1,984,820	0	0.0%	0.6%
Monthly and Annual Subtotals:					354	9,887,310	96	9,887,310	8	0.4%	30.8%
Wholesale (5, 7, 8 10, 11)	0	99	100	0.600	60	3,600	24	0	2	0.1%	0.0%
	100	199	100	1.000	36	3,600	0	0	0	0.0%	0.0%
	200	499	100	3.000	36	10,800	0	0	0	0.0%	0.0%
	500	799	100	3.000	36	10,800	0	0	0	0.0%	0.0%
	800	999	100	2.000	36	7,200	0	0	0	0.0%	0.0%
	1,000	1,499	100	5.000	36	18,000	0	0	0	0.0%	0.1%
	1,500	1,999	100	5.000	36	18,000	0	0	0	0.0%	0.1%
	2,000	2,499	100	5.000	36	18,000	0	0	0	0.0%	0.1%
	2,500	2,999	100	5.000	36	18,000	0	0	0	0.0%	0.1%
	3,000	4,999	100	20.000	36	72,000	0	0	0	0.0%	0.2%
	5,000	7,499	100	25.000	36	90,000	0	0	0	0.0%	0.3%
	7,500	9,999	100	25.000	36	90,000	0	0	0	0.0%	0.3%
	10,000	19,999	100	100.000	36	360,000	0	0	0	0.0%	1.1%
	20,000	29,999	100	100.000	36	360,000	0	0	0	0.0%	1.1%
	30,000	49,999	100	186.586	36	671,708	8	351,708	1	0.0%	2.1%
	50,000	69,999	100	178.058	28	498,562	4	218,562	0	0.0%	1.6%
	70,000	99,999	100	240.933	24	578,240	9	758,240	1	0.0%	1.8%
	100,000	299,999	100	1,555.787	15	2,333,680	7	1,433,680	1	0.0%	7.3%
	300,000	499,999	100	385.688	8	308,550	8	2,708,550	1	0.0%	1.0%
Monthly and Annual Subtotals:					639	5,470,740	60	5,470,740	5	0.2%	17.1%
Grand Totals:					83,147	32,079,010	24,924		2,077	100%	100%

**Table 3 - Operating Incomes
(and User Base Data)**
City of Higginsville, Missouri; Water Rates Scenario 2018-2

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)

\$50,033 Census Bureau estimate of AMHI for the year: 2016
\$31,497 Census Bureau estimate of AMHI for the year: 2000
\$18,536 AMHI growth during this time period
3.68% Simple annual income growth rate during this time period (used to project incomes into the future)

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

2 Number of new connections made during the test year
\$550 Average tap or installation fee assessed during the test year

This model is programmed to assume that rates will be reset in the "Analysis (This) 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. The change-over from the current rates to new rates is modeled to happen on the date near the top of Table 10. Thus, the revenues shown in the last column of that 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.

User (Customer) Basic Data

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

User (Customer) Basic Data			Years Following the Analysis Year (for Which Results Have Been Projected)										
(First year balances and incomes are actual , subsequent years are projected)	Inflation or Deflation (-) Factor	Test Year	Analysis (This) Year	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year
		Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting
		10/1/16	10/1/17	10/1/18	10/1/19	10/1/20	10/1/21	10/1/22	10/1/23	10/1/24	10/1/25	10/1/26	10/1/27
Average Number of Customers for the Year	N.A.	2,077	2,079	2,081	2,083	2,085	2,087	2,089	2,091	2,093	2,095	2,097	2,099
Actual and Projected Volumes for the Year, in Cu Ft	N.A.	32,079,010	32,109,900	32,140,790	32,171,679	32,202,569	32,233,459	32,264,349	32,295,238	32,326,128	32,357,018	32,387,908	32,418,797
Customers Added or Lost (-) During the Year	N.A.	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Customer Growth or Loss (-) Rate	N.A.	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Rate Increases Projected for Future Years	N.A.	N.A.	N.A.	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%

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.

How User Charge Fees Were Calculated, Accounting for New Customers and Future Rate Increases

Actual or Calculated Sales Revenues	\$1,084,962	\$1,154,720	\$1,409,376	\$1,460,106	\$1,512,663	\$1,567,108	\$1,623,511	\$1,681,942	\$1,742,475	\$1,805,185	\$1,870,150	\$1,937,452
Additional Sales Revenues From New Customers	\$280	\$1,355	\$1,403	\$1,451	\$1,502	\$1,554	\$1,609	\$1,665	\$1,723	\$1,784	\$1,846	\$1,909
Total Calculated Revenues (User Charge Fees)	\$1,084,962	\$1,155,000	\$1,410,731	\$1,461,510	\$1,514,114	\$1,568,609	\$1,625,065	\$1,683,551	\$1,744,140	\$1,806,909	\$1,871,934	\$1,939,258

Operating Incomes

3000 WATER SALES	N.A.	\$1,132,769	\$1,205,893	\$1,472,892	\$1,525,909	\$1,580,830	\$1,637,727	\$1,696,671	\$1,757,734	\$1,820,993	\$1,886,527	\$1,954,417	\$2,024,750
Late Payment Charge	N.A.	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
New Taps or Connections (Current Rate Structure)	% Above	\$1,100	\$823	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1	\$2
Meter Size-based System Development Fees (Table 12)	% Above	\$0	\$413	\$1,695	\$1,754	\$1,816	\$1,879	\$1,945	\$2,013	\$2,084	\$2,157	\$2,232	\$2,310
3010 BANK INTEREST INCOME	N.A.	\$1,425	\$2,435	\$2,788	\$3,632	\$4,467	\$5,322	\$5,466	\$5,629	\$5,838	\$5,973	\$6,155	\$6,387
3001 HYDRANT SALES	N.A.	\$175	\$175	\$175	\$175	\$175	\$175	\$175	\$175	\$175	\$175	\$175	\$175
3015 LAKE PERMITS	N.A.	\$5,208	\$5,208	\$5,208	\$5,208	\$5,208	\$5,208	\$5,208	\$5,208	\$5,208	\$5,208	\$5,208	\$5,208
3020 EQUIPMENT RENTALS	N.A.	-\$136	-\$136	-\$136	-\$136	-\$136	-\$136	-\$136	-\$136	-\$136	-\$136	-\$136	-\$136
3030 SERVICE CHARGES	N.A.	\$10,436	\$10,436	\$10,436	\$10,436	\$10,436	\$10,436	\$10,436	\$10,436	\$10,436	\$10,436	\$10,436	\$10,436
3090 MISCELLANEOUS	N.A.	\$9,877	\$9,877	\$9,877	\$9,877	\$9,877	\$9,877	\$9,877	\$9,877	\$9,877	\$9,877	\$9,877	\$9,877
Total Operating Incomes		\$1,160,856	\$1,235,124	\$1,502,936	\$1,556,856	\$1,612,674	\$1,670,490	\$1,729,643	\$1,790,937	\$1,854,476	\$1,920,218	\$1,988,366	\$2,059,010

Table 4 - Operating Costs (and Net Income)

City of Higginsville, Missouri; Water Rates Scenario 2018-2

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.)

	Inflation or Deflation (+/-) Factor	Test Year Starting 10/1/16	Analysis (This Year) Starting 10/1/17	Years Following the Analysis Year (for Which Results Have Been Projected)									
				1st Year Starting 10/1/18	2nd Year Starting 10/1/19	3rd Year Starting 10/1/20	4th Year Starting 10/1/21	5th Year Starting 10/1/22	6th Year Starting 10/1/23	7th Year Starting 10/1/24	8th Year Starting 10/1/25	9th Year Starting 10/1/26	10th Year Starting 10/1/27
WATER PRODUCTION 400-4000 SALARIES	3.0%	\$175,227	\$180,484	\$185,898	\$191,475	\$197,219	\$203,136	\$209,230	\$215,507	\$221,972	\$228,631	\$235,490	\$242,555
WATER PRODUCTION 400-4001 OVERTIME	3.0%	\$8,412	\$8,664	\$8,924	\$9,192	\$9,468	\$9,752	\$10,044	\$10,346	\$10,656	\$10,976	\$11,305	\$11,644
WATER PRODUCTION 400-4011 UTILITIES	3.0%	\$45,052	\$46,448	\$47,888	\$49,372	\$50,902	\$52,479	\$54,105	\$55,782	\$57,510	\$59,292	\$61,129	\$63,023
WATER PRODUCTION 400-4012 NATURAL GAS HEATING	3.0%	\$3,442	\$3,545	\$3,651	\$3,761	\$3,874	\$3,990	\$4,110	\$4,233	\$4,360	\$4,491	\$4,625	\$4,764
WATER PRODUCTION 400-4020 SUPPLIES	3.0%	\$1,609	\$1,658	\$1,707	\$1,759	\$1,811	\$1,866	\$1,922	\$1,979	\$2,039	\$2,100	\$2,163	\$2,228
WATER PRODUCTION 400-4023 CHEMICALS	3.0%	\$137,500	\$141,761	\$146,155	\$150,684	\$155,353	\$160,167	\$165,130	\$170,247	\$175,522	\$180,960	\$186,567	\$192,347
WATER PRODUCTION 400-4025 UNIFORMS	3.0%	\$624	\$642	\$662	\$681	\$702	\$723	\$745	\$767	\$790	\$814	\$838	\$863
WATER PRODUCTION 400-4026 GAC FILTERS	3.0%	\$27,400	\$28,249	\$29,125	\$30,027	\$30,958	\$31,917	\$32,906	\$33,926	\$34,977	\$36,060	\$37,178	\$38,329
WATER PRODUCTION 400-4040 FICA	3.0%	\$12,956	\$13,345	\$13,745	\$14,158	\$14,583	\$15,020	\$15,471	\$15,935	\$16,413	\$16,905	\$17,412	\$17,935
WATER PRODUCTION 400-4050 LAGERS	3.0%	\$23,686	\$24,397	\$25,129	\$25,882	\$26,659	\$27,459	\$28,282	\$29,131	\$30,005	\$30,905	\$31,832	\$32,787
WATER PRODUCTION 400-4060 MEDICAL BENEFITS	6.0%	\$51,664	\$54,763	\$58,049	\$61,532	\$65,224	\$69,137	\$73,286	\$77,683	\$82,344	\$87,284	\$92,521	\$98,073
WATER PRODUCTION 400-4071 SAFETY EQUIPMENT	3.0%	\$1,150	\$1,184	\$1,220	\$1,256	\$1,294	\$1,333	\$1,373	\$1,414	\$1,457	\$1,500	\$1,545	\$1,592
WATER PRODUCTION 400-4080 EQUIP MAINT	3.0%	\$21,535	\$22,181	\$22,846	\$23,532	\$24,238	\$24,965	\$25,714	\$26,485	\$27,280	\$28,098	\$28,941	\$29,809
WATER PRODUCTION 400-4081 LABORATORY MAINT	3.0%	\$9,088	\$9,361	\$9,641	\$9,931	\$10,229	\$10,535	\$10,851	\$11,177	\$11,512	\$11,858	\$12,213	\$12,580
WATER PRODUCTION 400-4082 BUILDING MAINT	3.0%	\$1,578	\$1,625	\$1,674	\$1,724	\$1,776	\$1,829	\$1,884	\$1,941	\$1,999	\$2,059	\$2,121	\$2,185
WATER PRODUCTION 400-4083 PUMPING MAINT	3.0%	\$402	\$414	\$427	\$441	\$454	\$468	\$483	\$498	\$513	\$529	\$545	\$562
WATER PRODUCTION 400-4084 LAKE MAINT	3.0%	\$1,439	\$1,484	\$1,530	\$1,577	\$1,626	\$1,676	\$1,728	\$1,782	\$1,837	\$1,894	\$1,953	\$2,013
WATER PRODUCTION 400-4086 RIVER PUMP MAINT	3.0%	\$14,893	\$15,354	\$15,830	\$16,321	\$16,827	\$17,348	\$17,886	\$18,440	\$19,011	\$19,600	\$20,207	\$20,833
WATER PRODUCTION 400-4090 VEHICLE FUEL	3.0%	\$322	\$332	\$342	\$352	\$363	\$374	\$385	\$396	\$408	\$420	\$433	\$446
WATER PRODUCTION 400-4110 TRAINING	3.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
WATER DISTRIBUTION 401-4000 SALARIES	3.0%	\$129,926	\$133,823	\$137,838	\$141,973	\$146,232	\$150,619	\$155,138	\$159,792	\$164,586	\$169,524	\$174,609	\$179,847
WATER DISTRIBUTION 401-4001 OVERTIME	3.0%	\$24,462	\$25,196	\$25,952	\$26,730	\$27,532	\$28,358	\$29,209	\$30,085	\$30,988	\$31,917	\$32,875	\$33,861
WATER DISTRIBUTION 401-4011 UTILITIES	3.0%	\$4,457	\$4,595	\$4,738	\$4,884	\$5,036	\$5,192	\$5,353	\$5,519	\$5,690	\$5,866	\$6,048	\$6,235
WATER DISTRIBUTION 401-4020 SUPPLIES	3.0%	\$2,674	\$2,754	\$2,837	\$2,922	\$3,010	\$3,100	\$3,193	\$3,289	\$3,388	\$3,489	\$3,594	\$3,702
WATER DISTRIBUTION 401-4021 TOOLS	3.0%	\$1,260	\$1,298	\$1,336	\$1,377	\$1,418	\$1,460	\$1,504	\$1,549	\$1,596	\$1,644	\$1,693	\$1,744
WATER DISTRIBUTION 401-4025 UNIFORMS	3.0%	\$948	\$977	\$1,006	\$1,036	\$1,067	\$1,099	\$1,132	\$1,166	\$1,201	\$1,237	\$1,274	\$1,313
WATER DISTRIBUTION 401-4040 FICA	3.0%	\$11,038	\$11,369	\$11,710	\$12,062	\$12,423	\$12,796	\$13,180	\$13,575	\$13,983	\$14,402	\$14,834	\$15,279
WATER DISTRIBUTION 401-4050 LAGERS	3.0%	\$22,774	\$23,457	\$24,160	\$24,885	\$25,632	\$26,401	\$27,193	\$28,009	\$28,849	\$29,714	\$30,606	\$31,524
WATER DISTRIBUTION 401-4060 MEDICAL BENEFITS	6.0%	\$40,727	\$43,171	\$45,761	\$48,506	\$51,417	\$54,502	\$57,772	\$61,238	\$64,913	\$68,807	\$72,936	\$77,312
WATER DISTRIBUTION 401-4071 SAFETY EQUIPMENT	3.0%	\$640	\$659	\$678	\$699	\$720	\$741	\$764	\$787	\$810	\$834	\$859	\$885
WATER DISTRIBUTION 401-4080 EQUIP MAINT	3.0%	\$3,703	\$3,814	\$3,928	\$4,046	\$4,167	\$4,292	\$4,421	\$4,554	\$4,690	\$4,831	\$4,976	\$5,125
WATER DISTRIBUTION 401-4081 TOWER & CLEARWELL MAINT	3.0%	\$420	\$433	\$446	\$460	\$474	\$489	\$504	\$520	\$536	\$552	\$569	\$587
WATER DISTRIBUTION 401-4082 BUILDING MAINT	3.0%	\$2,802	\$2,886	\$2,972	\$3,061	\$3,153	\$3,248	\$3,345	\$3,446	\$3,549	\$3,656	\$3,765	\$3,878
WATER DISTRIBUTION 401-4083 MAINS MAINT	3.0%	\$17,445	\$17,969	\$18,508	\$19,063	\$19,635	\$20,224	\$20,831	\$21,456	\$22,099	\$22,762	\$23,445	\$24,148
WATER DISTRIBUTION 401-4084 HYDRANTS MAINT	3.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
WATER DISTRIBUTION 401-4085 VEHICLE MAINT	3.0%	\$3,903	\$4,020	\$4,141	\$4,265	\$4,393	\$4,525	\$4,660	\$4,800	\$4,944	\$5,092	\$5,245	\$5,403
WATER DISTRIBUTION 401-4086 METER MAINT	3.0%	\$6,354	\$6,545	\$6,741	\$6,944	\$7,152	\$7,366	\$7,587	\$7,815	\$8,050	\$8,291	\$8,540	\$8,796
WATER DISTRIBUTION 401-4087 SERVICE MAINT	3.0%	\$2,905	\$2,992	\$3,082	\$3,175	\$3,270	\$3,368	\$3,469	\$3,573	\$3,680	\$3,791	\$3,904	\$4,021
WATER DISTRIBUTION 401-4090 VEHICLE FUEL	3.0%	\$4,152	\$4,276	\$4,404	\$4,537	\$4,673	\$4,813	\$4,957	\$5,106	\$5,259	\$5,417	\$5,579	\$5,747
WATER DISTRIBUTION 401-4110 TRAINING	3.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
WATER COUNCIL 402-4000 SALARIES	3.0%	\$62,777	\$64,660	\$66,600	\$68,598	\$70,656	\$72,776	\$74,959	\$77,208	\$79,524	\$81,910	\$84,367	\$86,898
WATER COUNCIL 402-4001 OVERTIME	3.0%	\$496	\$511	\$526	\$542	\$559	\$575	\$593	\$610	\$629	\$647	\$667	\$687
WATER COUNCIL 402-4002 MAYOR & BOARD	3.0%	\$2,118	\$2,181	\$2,246	\$2,314	\$2,383	\$2,455	\$2,528	\$2,604	\$2,682	\$2,763	\$2,846	\$2,931

**Table 4 - Operating Costs
(and Net Income)**

	Inflation or Deflation (-) Factor	Test Year Starting 10/1/16	Analysis (This) Year Starting 10/1/17	1st Year Starting 10/1/18	2nd Year Starting 10/1/19	3rd Year Starting 10/1/20	4th Year Starting 10/1/21	5th Year Starting 10/1/22	6th Year Starting 10/1/23	7th Year Starting 10/1/24	8th Year Starting 10/1/25	9th Year Starting 10/1/26	10th Year Starting 10/1/27
WATER COUNCIL 402-4003 LAKE SALARIES	3.0%	\$8,904	\$9,172	\$9,447	\$9,730	\$10,022	\$10,323	\$10,632	\$10,951	\$11,280	\$11,618	\$11,967	\$12,326
WATER COUNCIL 402-4013 TELEPHONE	3.0%	\$6,349	\$6,539	\$6,735	\$6,937	\$7,146	\$7,360	\$7,581	\$7,808	\$8,042	\$8,284	\$8,532	\$8,788
WATER COUNCIL 402-4020 SUPPLIES	3.0%	\$1,711	\$1,762	\$1,815	\$1,869	\$1,925	\$1,983	\$2,043	\$2,104	\$2,167	\$2,232	\$2,299	\$2,368
WATER COUNCIL 402-4024 POSTAGE	3.0%	\$2,685	\$2,768	\$2,854	\$2,942	\$3,033	\$3,127	\$3,224	\$3,324	\$3,427	\$3,533	\$3,643	\$3,756
WATER COUNCIL 402-4030 INSURANCE (MIRMA)	3.0%	\$54,905	\$56,552	\$58,249	\$59,996	\$61,796	\$63,650	\$65,559	\$67,526	\$69,552	\$71,639	\$73,788	\$76,001
WATER COUNCIL 402-4040 FICA	3.0%	\$5,627	\$5,796	\$5,970	\$6,149	\$6,333	\$6,523	\$6,719	\$6,921	\$7,128	\$7,342	\$7,562	\$7,789
WATER COUNCIL 402-4050 LAGERS	3.0%	\$10,604	\$10,922	\$11,249	\$11,587	\$11,934	\$12,292	\$12,661	\$13,041	\$13,432	\$13,835	\$14,250	\$14,678
WATER COUNCIL 402-4060 MEDICAL BENEFITS	6.0%	\$15,002	\$15,902	\$16,857	\$17,868	\$18,940	\$20,076	\$21,281	\$22,558	\$23,911	\$25,346	\$26,867	\$28,479
WATER COUNCIL 402-4080 EQUIP MAINT - CH	3.0%	\$6,743	\$6,945	\$7,153	\$7,368	\$7,589	\$7,817	\$8,051	\$8,293	\$8,541	\$8,798	\$9,062	\$9,334
WATER COUNCIL 402-4082 BUILDING MAINT-CH	3.0%	\$1,665	\$1,715	\$1,766	\$1,819	\$1,874	\$1,930	\$1,988	\$2,047	\$2,109	\$2,172	\$2,237	\$2,304
WATER COUNCIL 402-4087 RADIO MAINT	3.0%	\$89	\$91	\$94	\$97	\$100	\$103	\$106	\$109	\$112	\$115	\$119	\$123
WATER COUNCIL 402-4093 ONE-CALL	3.0%	\$183	\$189	\$194	\$200	\$206	\$212	\$219	\$225	\$232	\$239	\$246	\$253
WATER COUNCIL 402-4094 DISPATCHING	3.0%	\$6,000	\$6,180	\$6,365	\$6,556	\$6,753	\$6,956	\$7,164	\$7,379	\$7,601	\$7,829	\$8,063	\$8,305
WATER COUNCIL 402-4095 PROFESSIONAL FEES	3.0%	\$11,274	\$11,613	\$11,961	\$12,320	\$12,689	\$13,070	\$13,462	\$13,866	\$14,282	\$14,710	\$15,152	\$15,606
WATER COUNCIL 402-4096 LEGAL	3.0%	\$1,265	\$1,303	\$1,342	\$1,383	\$1,424	\$1,467	\$1,511	\$1,556	\$1,603	\$1,651	\$1,700	\$1,751
WATER COUNCIL 402-4097 ENGINEERING	3.0%	\$11,880	\$12,236	\$12,603	\$12,982	\$13,371	\$13,772	\$14,185	\$14,611	\$15,049	\$15,501	\$15,966	\$16,445
WATER COUNCIL 402-4110 TRAINING	3.0%	\$5,413	\$5,575	\$5,743	\$5,915	\$6,092	\$6,275	\$6,464	\$6,657	\$6,857	\$7,063	\$7,275	\$7,493
WATER COUNCIL 402-4113 ECONOMIC DIRECTOR	3.0%	\$18,318	\$18,868	\$19,434	\$20,017	\$20,617	\$21,236	\$21,873	\$22,529	\$23,205	\$23,901	\$24,618	\$25,357
WATER COUNCIL 402-4114 BUILDING OFFICIAL	3.0%	\$15,946	\$16,424	\$16,917	\$17,424	\$17,947	\$18,485	\$19,040	\$19,611	\$20,199	\$20,805	\$21,430	\$22,072
WATER COUNCIL 402-4115 MAPPING	3.0%	\$16,873	\$17,379	\$17,900	\$18,438	\$18,991	\$19,560	\$20,147	\$20,752	\$21,374	\$22,015	\$22,676	\$23,356
WATER COUNCIL 402-4299 AUDIT	3.0%	\$3,314	\$3,413	\$3,516	\$3,621	\$3,730	\$3,842	\$3,957	\$4,076	\$4,198	\$4,324	\$4,454	\$4,587
WATER COUNCIL 402-4300 BAD DEBT	3.0%	\$2,293	\$2,364	\$2,437	\$2,512	\$2,590	\$2,670	\$2,753	\$2,839	\$2,926	\$3,017	\$3,111	\$3,207
WATER COUNCIL 402-4310 BOND INTEREST/FEES	3.0%	\$936	\$964	\$992	\$1,022	\$1,053	\$1,085	\$1,117	\$1,151	\$1,185	\$1,221	\$1,257	\$1,295
WATER COUNCIL 402-4555 MISCELLANEOUS	3.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Payment in Lieu of Taxes, 6% of Previous Years' Water Sales	0.0%	\$0	\$17,131	\$17,354	\$17,584	\$17,819	\$18,059	\$18,304	\$18,554	\$18,809	\$19,069	\$19,334	\$19,604
One-time Reduction of R&R Annuity	0.0%	-\$180,530	-\$135,398	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Annual Payment to Repair & Replacement (Table 7)	0.0%	\$180,530	\$180,530	\$180,530	\$180,530	\$180,530	\$180,530	\$180,530	\$180,530	\$180,530	\$180,530	\$180,530	\$180,530
User Charge Analysis Services	5.0%	\$0	\$9,383	\$0	\$0	\$10,345	\$0	\$0	\$11,405	\$0	\$0	\$12,574	\$0
CIP Spending Plan	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		\$1,091,935	\$1,199,796	\$1,418,534	\$1,473,392	\$1,527,146	\$1,561,769	\$1,608,358	\$1,668,036	\$1,706,657	\$1,758,504	\$1,824,820	\$1,867,960
Net Income (or Loss)		\$68,921	\$35,328	\$84,403	\$83,464	\$85,528	\$108,721	\$121,285	\$122,901	\$147,819	\$161,714	\$163,546	\$191,049
Working Capital Goal: 35%		In Dollars, That is:	\$382,177	\$419,928	\$496,487	\$515,687	\$534,501	\$546,619	\$562,925	\$583,813	\$597,330	\$615,476	\$638,687

Notes: The yellow highlighted cost items above are expected to rise due to inflation and due to the additional cost of serving new customers. Medical insurance is also expected to rise faster than the average rate of inflation.

Table 5 - Capital Improvement Program (CIP)

City of Higginsville, Missouri; Water Rates Scenario 2018-2

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

This table depicts capital improvements and their funding. Costs reflect inflation.			Years Following the Analysis Year (for Which Improvement Projects, Costs, Funding, etc. Have Been Projected)											
CIP Spending Plan	Test Year	Analysis (This Year	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year		
	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting		
	10/1/16	10/1/17	10/1/18	10/1/19	10/1/20	10/1/21	10/1/22	10/1/23	10/1/24	10/1/25	10/1/26	10/1/27		
Debt-paid Capital Improvements			(The portion of improvements that will be funded with loans are shown in this section. The balance of each of these improvements will be funded with grants and/or utility reserves. That is shown in the next section.)											
New Water Plant (Placekeeper) Project			\$0	\$0	\$0	\$0	\$0	\$3,000,000	\$0	\$0	\$0	\$0	\$0	
Loan Closing Costs at 2.5%			\$0	\$0	\$0	\$0	\$0	\$75,000	\$0	\$0	\$0	\$0	\$0	
Total Capital Improvements to be Paid With Debt			\$0	\$0	\$0	\$0	\$0	\$3,075,000	\$0	\$0	\$0	\$0	\$0	
Cash and Grant-paid Capital Improvements			(This section includes the grant and reserves-funded portion of each improvement project. The actual grant amounts expected are shown in the CIP Funding Plan section that follows.)											
New Water Plant (Placekeeper) Project			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Loan Closing Costs at 2.5%			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Total Cash and Grant-paid Capital Improvements			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Total CIP Planned Spending			\$0	\$0	\$0	\$0	\$0	\$3,075,000	\$0	\$0	\$0	\$0	\$0	
CIP Funding Plan														
Cash Reserves (Internal Funds)														
Debt Service and CIP Reserves Starting Balance			\$0	\$0	\$0	\$0	\$0	\$94,305	\$201,171	\$119,151	\$67,779	\$24,645	-\$22,584	
Working Capital Transferred to Debt Service and CIP Reserves			\$0	\$0	\$0	\$0	\$94,305	\$104,979	\$102,013	\$134,302	\$143,567	\$140,335	\$175,951	
Debt Service and CIP Reserves Interest Earned (or Paid)			\$0	\$0	\$0	\$0	\$0	\$1,886	\$4,023	\$2,383	\$1,356	\$493	-\$452	
Cash Total			\$0	\$0	\$0	\$0	\$0	\$94,305	\$201,171	\$307,208	\$255,836	\$212,702	\$165,473	\$152,915
Grant and Loan Proceeds (External Funds)														
Grants, None Assumed			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Loan Originated in 5th Year								\$3,075,000	\$0	\$0	\$0	\$0	\$0	
Grant and Loan Proceeds Total			\$0	\$0	\$0	\$0	\$0	\$3,075,000	\$0	\$0	\$0	\$0	\$0	
Total Cash Reserves, Grant and Loan Proceeds			\$0	\$0	\$0	\$0	\$94,305	\$3,276,171	\$307,208	\$255,836	\$212,702	\$165,473	\$152,915	
Debt Payment Plan			Payments for future loans assume 100 percent financing for projects, term of: 20 years and 2.000% Interest											
Loan Originated in 5th Year									\$188,057	\$188,057	\$188,057	\$188,057	\$188,057	
Total Debt Payments			\$0	\$0	\$0	\$0	\$0	\$0	\$188,057	\$188,057	\$188,057	\$188,057	\$188,057	
CIP Spending Net of Grant and Loan Proceeds			\$0	\$0	\$0	\$0	\$0	\$0	\$188,057	\$188,057	\$188,057	\$188,057	\$188,057	
Debt Service and CIP Reserves Ending Balance			\$0	\$0	\$0	\$0	\$0	\$94,305	\$201,171	\$119,151	\$67,779	\$24,645	-\$22,584	-\$35,142

Notes: It is assumed the City needs to build a new water treatment plant. For rate setting purposes, assuming the worst-case scenario, it was assumed 100% of that cost will be paid with a SRF loan and the project itself will cost \$3,000,000, plus loan closing costs to be included in the loan.

Table 6 - Equipment Replacement Schedule (R&R)
City of Higginsville, Missouri; Water Rates Scenario 2018-2

1 Year Replacement Cycle

Year Beginning	Average annual R&R cost for operating equipment, estimated at 15 percent of operating costs. Does not include admin, billing, cost of treatment by Byrnes Mill and similar costs.							Total Annual Replacement Costs
10/1/17	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/18	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/19	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/20	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/21	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/22	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/23	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/24	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/25	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/26	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/27	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/28	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/29	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/30	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/31	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/32	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/33	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/34	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/35	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/36	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/37	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/38	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/39	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/40	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785
10/1/41	\$122,785	\$0	\$0	\$0	\$0	\$0	\$0	\$122,785

Replacement Scheduler Version 1.5, copyright 2016. The program itself may not be copied but report output may be so long as credit is ascribed to the developer, Carl E. Brown of GettingGreatRates.com.

Table 7 - Equipment Replacement Annuity Calculation

City of Higginsville, Missouri; Water Rates Scenario 2018-2

This schedule calculates the annual annuity (savings deposit) needed to build "R&R" reserves. This annuity amount should actually be deposited in a savings account. The annuity amount, called the "Annual Payment to Repair & Replacement" in Table 7, 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
10/1/17	Analysis Year	\$122,785	\$122,785	\$0	-\$122,785	\$116,646
10/1/18	1st Year	\$122,785	\$126,469	-\$2,456	-\$71,179	\$120,145
10/1/19	2nd Year	\$122,785	\$130,263	-\$1,424	-\$22,335	\$123,750
10/1/20	3rd Year	\$122,785	\$134,171	-\$447	\$23,578	\$127,462
10/1/21	4th Year	\$122,785	\$138,196	\$472	\$66,384	\$131,286
10/1/22	5th Year	\$122,785	\$142,342	\$1,328	\$105,900	\$135,224
10/1/23	6th Year	\$122,785	\$146,612	\$2,118	\$141,936	\$139,281
10/1/24	7th Year	\$122,785	\$151,010	\$2,839	\$174,295	\$143,460
10/1/25	8th Year	\$122,785	\$155,540	\$3,486	\$202,770	\$147,763
10/1/26	9th Year	\$122,785	\$160,207	\$4,055	\$227,149	\$152,196
10/1/27	10th Year	\$122,785	\$165,013	\$4,543	\$247,210	\$156,762
10/1/28	11th Year	\$122,785	\$169,963	\$4,944	\$262,721	\$161,465
10/1/29	12th Year	\$122,785	\$175,062	\$5,254	\$273,443	\$166,309
10/1/30	13th Year	\$122,785	\$180,314	\$5,469	\$279,128	\$171,298
10/1/31	14th Year	\$122,785	\$185,723	\$5,583	\$279,517	\$176,437
10/1/32	15th Year	\$122,785	\$191,295	\$5,590	\$274,343	\$181,730
10/1/33	16th Year	\$122,785	\$197,034	\$5,487	\$263,326	\$187,182
10/1/34	17th Year	\$122,785	\$202,945	\$5,267	\$246,177	\$192,798
10/1/35	18th Year	\$122,785	\$209,033	\$4,924	\$222,598	\$198,582
10/1/36	19th Year	\$122,785	\$215,304	\$4,452	\$192,275	\$204,539
Starting Account Balance					\$0	\$116,646
Value less Starting Account Balance					\$2,698,451	Minimum Desired Balance in Today's Dollars
Capital Recovery Factor					0.063782	
Minimum Annual Annuity					\$172,112	
Discretionary Annuity					\$8,418	

Notes: There is currently no R&R schedule. Average R&R costs were instead estimated. A Discretionary Annuity amount was added so that at the end of the 20-year modeling period, the balance will equal the average of the annual replacement cost amounts, less interest paid for borrowing during the negative balance years.

Required Annual Deposit (Annuity) to Replacement Account \$180,530

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

Table 8 - Average Cost Classification

City of Higginsville, Missouri; Water Rates Scenario 2018-2

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: 10/1/2023 through 9/30/2024						
Cost Items	Cost During Average Rate Structure Basis Year	Fixed Cost Percentage	Variable Cost Percentage	Average Fixed Cost	Average Variable Cost	
WATER PRODUCTION 400-4000 SALARIES	\$215,507	25.0%	75.0%	\$53,877	\$161,630	
WATER PRODUCTION 400-4001 OVERTIME	\$10,346	25.0%	75.0%	\$2,586	\$7,759	
WATER PRODUCTION 400-4011 UTILITIES	\$55,782	0.0%	100.0%	\$0	\$55,782	
WATER PRODUCTION 400-4012 NATURAL GAS HEATING	\$4,233	25.0%	75.0%	\$1,058	\$3,175	
WATER PRODUCTION 400-4020 SUPPLIES	\$1,979	25.0%	75.0%	\$495	\$1,484	
WATER PRODUCTION 400-4023 CHEMICALS	\$170,247	0.0%	100.0%	\$0	\$170,247	
WATER PRODUCTION 400-4025 UNIFORMS	\$767	25.0%	75.0%	\$192	\$575	
WATER PRODUCTION 400-4026 GAC FILTERS	\$33,926	0.0%	100.0%	\$0	\$33,926	
WATER PRODUCTION 400-4040 FICA	\$15,935	25.0%	75.0%	\$3,984	\$11,951	
WATER PRODUCTION 400-4050 LAGERS	\$29,131	25.0%	75.0%	\$7,283	\$21,848	
WATER PRODUCTION 400-4060 MEDICAL BENEFITS	\$77,683	25.0%	75.0%	\$19,421	\$58,262	
WATER PRODUCTION 400-4071 SAFETY EQUIPMENT	\$1,414	25.0%	75.0%	\$354	\$1,061	
WATER PRODUCTION 400-4080 EQUIP MAINT	\$26,485	25.0%	75.0%	\$6,621	\$19,864	
WATER PRODUCTION 400-4081 LABORATORY MAINT	\$11,177	25.0%	75.0%	\$2,794	\$8,383	
WATER PRODUCTION 400-4082 BUILDING MAINT	\$1,941	25.0%	75.0%	\$485	\$1,456	
WATER PRODUCTION 400-4083 PUMPING MAINT	\$498	0.0%	100.0%	\$0	\$498	
WATER PRODUCTION 400-4084 LAKE MAINT	\$1,782	0.0%	100.0%	\$0	\$1,782	
WATER PRODUCTION 400-4086 RIVER PUMP MAINT	\$18,440	0.0%	100.0%	\$0	\$18,440	
WATER PRODUCTION 400-4090 VEHICLE FUEL	\$396	25.0%	75.0%	\$99	\$297	
WATER PRODUCTION 400-4110 TRAINING	\$0	25.0%	75.0%	\$0	\$0	
WATER DISTRIBUTION 401-4000 SALARIES	\$159,792	25.0%	75.0%	\$39,948	\$119,844	
WATER DISTRIBUTION 401-4001 OVERTIME	\$30,085	25.0%	75.0%	\$7,521	\$22,564	
WATER DISTRIBUTION 401-4011 UTILITIES	\$5,519	0.0%	100.0%	\$0	\$5,519	
WATER DISTRIBUTION 401-4020 SUPPLIES	\$3,289	25.0%	75.0%	\$822	\$2,467	
WATER DISTRIBUTION 401-4021 TOOLS	\$1,549	25.0%	75.0%	\$387	\$1,162	
WATER DISTRIBUTION 401-4025 UNIFORMS	\$1,166	25.0%	75.0%	\$292	\$875	
WATER DISTRIBUTION 401-4040 FICA	\$13,575	25.0%	75.0%	\$3,394	\$10,182	
WATER DISTRIBUTION 401-4050 LAGERS	\$28,009	25.0%	75.0%	\$7,002	\$21,006	
WATER DISTRIBUTION 401-4060 MEDICAL BENEFITS	\$61,238	25.0%	75.0%	\$15,310	\$45,929	
WATER DISTRIBUTION 401-4071 SAFETY EQUIPMENT	\$787	25.0%	75.0%	\$197	\$590	
WATER DISTRIBUTION 401-4080 EQUIP MAINT	\$4,554	25.0%	75.0%	\$1,138	\$3,415	
WATER DISTRIBUTION 401-4081 TOWER & CLEARWELL MAINT	\$520	0.0%	100.0%	\$0	\$520	
WATER DISTRIBUTION 401-4082 BUILDING MAINT	\$3,446	25.0%	75.0%	\$861	\$2,584	
WATER DISTRIBUTION 401-4083 MAINS MAINT	\$21,456	25.0%	75.0%	\$5,364	\$16,092	
WATER DISTRIBUTION 401-4084 HYDRANTS MAINT	\$0	25.0%	75.0%	\$0	\$0	
WATER DISTRIBUTION 401-4085 VEHICLE MAINT	\$4,800	25.0%	75.0%	\$1,200	\$3,600	
WATER DISTRIBUTION 401-4086 METER MAINT	\$7,815	0.0%	100.0%	\$0	\$7,815	
WATER DISTRIBUTION 401-4087 SERVICE MAINT	\$3,573	25.0%	75.0%	\$893	\$2,680	
WATER DISTRIBUTION 401-4090 VEHICLE FUEL	\$5,106	25.0%	75.0%	\$1,276	\$3,829	
WATER DISTRIBUTION 401-4110 TRAINING	\$0	25.0%	75.0%	\$0	\$0	
WATER COUNCIL 402-4000 SALARIES	\$77,208	100.0%	0.0%	\$77,208	\$0	

Table 8 - Average Cost Classification

Cost Items	Cost During Average Rate Structure Basis Year	Fixed Cost Percentage	Variable Cost Percentage	Average Fixed Cost	Average Variable Cost
WATER COUNCIL 402-4001 OVERTIME	\$610	100.0%	0.0%	\$610	\$0
WATER COUNCIL 402-4002 MAYOR & BOARD	\$2,604	100.0%	0.0%	\$2,604	\$0
WATER COUNCIL 402-4003 LAKE SALARIES	\$10,951	100.0%	0.0%	\$10,951	\$0
WATER COUNCIL 402-4013 TELEPHONE	\$7,808	100.0%	0.0%	\$7,808	\$0
WATER COUNCIL 402-4020 SUPPLIES	\$2,104	100.0%	0.0%	\$2,104	\$0
WATER COUNCIL 402-4024 POSTAGE	\$3,324	100.0%	0.0%	\$3,324	\$0
WATER COUNCIL 402-4030 INSURANCE (MIRMA)	\$67,526	100.0%	0.0%	\$67,526	\$0
WATER COUNCIL 402-4040 FICA	\$6,921	100.0%	0.0%	\$6,921	\$0
WATER COUNCIL 402-4050 LAGERS	\$13,041	100.0%	0.0%	\$13,041	\$0
WATER COUNCIL 402-4060 MEDICAL BENEFITS	\$22,558	100.0%	0.0%	\$22,558	\$0
WATER COUNCIL 402-4080 EQUIP MAINT - CH	\$8,293	100.0%	0.0%	\$8,293	\$0
WATER COUNCIL 402-4082 BUILDING MAINT-CH	\$2,047	100.0%	0.0%	\$2,047	\$0
WATER COUNCIL 402-4087 RADIO MAINT	\$109	100.0%	0.0%	\$109	\$0
WATER COUNCIL 402-4093 ONE-CALL	\$225	100.0%	0.0%	\$225	\$0
WATER COUNCIL 402-4094 DISPATCHING	\$7,379	100.0%	0.0%	\$7,379	\$0
WATER COUNCIL 402-4095 PROFESSIONAL FEES	\$13,866	100.0%	0.0%	\$13,866	\$0
WATER COUNCIL 402-4096 LEGAL	\$1,556	100.0%	0.0%	\$1,556	\$0
WATER COUNCIL 402-4097 ENGINEERING	\$14,611	100.0%	0.0%	\$14,611	\$0
WATER COUNCIL 402-4110 TRAINING	\$6,657	100.0%	0.0%	\$6,657	\$0
WATER COUNCIL 402-4113 ECONOMIC DIRECTOR	\$22,529	100.0%	0.0%	\$22,529	\$0
WATER COUNCIL 402-4114 BUILDING OFFICIAL	\$19,611	100.0%	0.0%	\$19,611	\$0
WATER COUNCIL 402-4115 MAPPING	\$20,752	100.0%	0.0%	\$20,752	\$0
WATER COUNCIL 402-4299 AUDIT	\$4,076	100.0%	0.0%	\$4,076	\$0
WATER COUNCIL 402-4300 BAD DEBT	\$2,839	100.0%	0.0%	\$2,839	\$0
WATER COUNCIL 402-4310 BOND INTEREST/FEES	\$1,151	100.0%	0.0%	\$1,151	\$0
WATER COUNCIL 402-4555 MISCELLANEOUS	\$0	25.0%	75.0%	\$0	\$0
Payment in Lieu of Taxes, 6% of Previous Years' Water Sales	\$0	25.0%	75.0%	\$0	\$0
Annual Payment to Repair & Replacement (Table 7)	\$180,530	25.0%	75.0%	\$45,133	\$135,398
User Charge Analysis Services	\$11,405	25.0%	75.0%	\$2,851	\$8,554
CIP Spending Plan (Table 5)	\$188,057	25.0%	75.0%	\$47,014	\$141,043
Grand Total Costs, Weighted Avg Percentages	\$1,754,293	35.4%	64.6%	\$620,209	\$1,134,084

Bases for Cost to Serve Rate Structure		100%	\$1,754,293
Number of Customers During Basis Year =	2,091	Unbilled-for Water is Estimated at	23%
Billed Volume, in Cu Ft, During Basis Year =	32,295,238	Unbilled-for Water is Estimated at This Percentage of Average Cost	60%
Average Fixed Cost per User per Month During Basis Year =	\$24.72	Resulting Cost of Unbilled-for Water	\$200,861
Average Variable Cost to Produce per 100 Cu Ft During Basis Year =	\$3.51	Test Year Customer Metered Volume, in Cu Ft	32,079,010
Cu Ft per Billing Cycle Used by Average Residential Customer =	469	+ Test Year Unbilled-for Water, in Cu Ft	9,527,006
		Total Test Year Volume, in Cu Ft, From Master Meter Readings	41,606,016

Table 9 - Marginal Cost Classification

City of Higginsville, Missouri; Water Rates Scenario 2018-2

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.

In the calculations below, it is assumed that marginal fixed costs are being calculated for: **Snowbirds**

and, marginal variable costs are being calculated for: **Water Districts and Wholesale Customers**

The marginal rate structure basis year runs from: 10/1/2023 through 9/30/2024

Cost Items	Average Fixed Cost	Average Variable Cost	Marginal Fixed Cost Percentage	Marginal Variable Cost Percentage	Marginal Fixed Cost	Marginal Variable Cost
WATER PRODUCTION 400-4000 SALARIES	\$53,877	\$161,630	100%	33.3%	\$53,877	\$53,871
WATER PRODUCTION 400-4001 OVERTIME	\$2,586	\$7,759	100%	33.3%	\$2,586	\$2,586
WATER PRODUCTION 400-4011 UTILITIES	\$0	\$55,782	100%	100.0%	\$0	\$55,782
WATER PRODUCTION 400-4012 NATURAL GAS HEATING	\$1,058	\$3,175	100%	100.0%	\$1,058	\$3,175
WATER PRODUCTION 400-4020 SUPPLIES	\$495	\$1,484	100%	100.0%	\$495	\$1,484
WATER PRODUCTION 400-4023 CHEMICALS	\$0	\$170,247	100%	100.0%	\$0	\$170,247
WATER PRODUCTION 400-4025 UNIFORMS	\$192	\$575	100%	33.3%	\$192	\$192
WATER PRODUCTION 400-4026 GAC FILTERS	\$0	\$33,926	100%	100.0%	\$0	\$33,926
WATER PRODUCTION 400-4040 FICA	\$3,984	\$11,951	100%	33.3%	\$3,984	\$3,983
WATER PRODUCTION 400-4050 LAGERS	\$7,283	\$21,848	100%	33.3%	\$7,283	\$7,282
WATER PRODUCTION 400-4060 MEDICAL BENEFITS	\$19,421	\$58,262	100%	33.3%	\$19,421	\$19,419
WATER PRODUCTION 400-4071 SAFETY EQUIPMENT	\$354	\$1,061	100%	33.3%	\$354	\$354
WATER PRODUCTION 400-4080 EQUIP MAINT	\$6,621	\$19,864	100%	100.0%	\$6,621	\$19,864
WATER PRODUCTION 400-4081 LABORATORY MAINT	\$2,794	\$8,383	100%	100.0%	\$2,794	\$8,383
WATER PRODUCTION 400-4082 BUILDING MAINT	\$485	\$1,456	100%	100.0%	\$485	\$1,456
WATER PRODUCTION 400-4083 PUMPING MAINT	\$0	\$498	100%	100.0%	\$0	\$498
WATER PRODUCTION 400-4084 LAKE MAINT	\$0	\$1,782	100%	100.0%	\$0	\$1,782
WATER PRODUCTION 400-4086 RIVER PUMP MAINT	\$0	\$18,440	100%	100.0%	\$0	\$18,440
WATER PRODUCTION 400-4090 VEHICLE FUEL	\$99	\$297	100%	33.3%	\$99	\$99
WATER PRODUCTION 400-4110 TRAINING	\$0	\$0	100%	33.3%	\$0	\$0
WATER DISTRIBUTION 401-4000 SALARIES	\$39,948	\$119,844	100%	33.3%	\$39,948	\$39,944
WATER DISTRIBUTION 401-4001 OVERTIME	\$7,521	\$22,564	100%	33.3%	\$7,521	\$7,521
WATER DISTRIBUTION 401-4011 UTILITIES	\$0	\$5,519	100%	100.0%	\$0	\$5,519
WATER DISTRIBUTION 401-4020 SUPPLIES	\$822	\$2,467	100%	100.0%	\$822	\$2,467
WATER DISTRIBUTION 401-4021 TOOLS	\$387	\$1,162	100%	100.0%	\$387	\$1,162
WATER DISTRIBUTION 401-4025 UNIFORMS	\$292	\$875	100%	33.3%	\$292	\$292
WATER DISTRIBUTION 401-4040 FICA	\$3,394	\$10,182	100%	33.3%	\$3,394	\$3,394
WATER DISTRIBUTION 401-4050 LAGERS	\$7,002	\$21,006	100%	33.3%	\$7,002	\$7,001
WATER DISTRIBUTION 401-4060 MEDICAL BENEFITS	\$15,310	\$45,929	100%	33.3%	\$15,310	\$15,308
WATER DISTRIBUTION 401-4071 SAFETY EQUIPMENT	\$197	\$590	100%	33.3%	\$197	\$197
WATER DISTRIBUTION 401-4080 EQUIP MAINT	\$1,138	\$3,415	100%	100.0%	\$1,138	\$3,415
WATER DISTRIBUTION 401-4081 TOWER & CLEARWELL MAINT	\$0	\$520	100%	100.0%	\$0	\$520
WATER DISTRIBUTION 401-4082 BUILDING MAINT	\$861	\$2,584	100%	100.0%	\$861	\$2,584
WATER DISTRIBUTION 401-4083 MAINS MAINT	\$5,364	\$16,092	100%	100.0%	\$5,364	\$16,092
WATER DISTRIBUTION 401-4084 HYDRANTS MAINT	\$0	\$0	100%	0.0%	\$0	\$0
WATER DISTRIBUTION 401-4085 VEHICLE MAINT	\$1,200	\$3,600	100%	33.3%	\$1,200	\$1,200
WATER DISTRIBUTION 401-4086 METER MAINT	\$0	\$7,815	100%	100.0%	\$0	\$7,815
WATER DISTRIBUTION 401-4087 SERVICE MAINT	\$893	\$2,680	100%	33.3%	\$893	\$893
WATER DISTRIBUTION 401-4090 VEHICLE FUEL	\$1,276	\$3,829	100%	33.3%	\$1,276	\$1,276
WATER DISTRIBUTION 401-4110 TRAINING	\$0	\$0	100%	33.3%	\$0	\$0

Table 9 - Marginal Cost Classification

Cost Items	Average Fixed Cost	Average Variable Cost	Marginal Fixed Cost Percentage	Marginal Variable Cost Percentage	Marginal Fixed Cost	Marginal Variable Cost
WATER COUNCIL 402-4000 SALARIES	\$77,208	\$0	50%	100.0%	\$38,604	\$0
WATER COUNCIL 402-4001 OVERTIME	\$610	\$0	50%	100.0%	\$305	\$0
WATER COUNCIL 402-4002 MAYOR & BOARD	\$2,604	\$0	50%	100.0%	\$1,302	\$0
WATER COUNCIL 402-4003 LAKE SALARIES	\$10,951	\$0	50%	100.0%	\$5,476	\$0
WATER COUNCIL 402-4013 TELEPHONE	\$7,808	\$0	100%	100.0%	\$7,808	\$0
WATER COUNCIL 402-4020 SUPPLIES	\$2,104	\$0	100%	100.0%	\$2,104	\$0
WATER COUNCIL 402-4024 POSTAGE	\$3,324	\$0	100%	100.0%	\$3,324	\$0
WATER COUNCIL 402-4030 INSURANCE (MIRMA)	\$67,526	\$0	100%	100.0%	\$67,526	\$0
WATER COUNCIL 402-4040 FICA	\$6,921	\$0	50%	100.0%	\$3,460	\$0
WATER COUNCIL 402-4050 LAGERS	\$13,041	\$0	50%	100.0%	\$6,520	\$0
WATER COUNCIL 402-4060 MEDICAL BENEFITS	\$22,558	\$0	50%	100.0%	\$11,279	\$0
WATER COUNCIL 402-4080 EQUIP MAINT - CH	\$8,293	\$0	100%	100.0%	\$8,293	\$0
WATER COUNCIL 402-4082 BUILDING MAINT-CH	\$2,047	\$0	100%	100.0%	\$2,047	\$0
WATER COUNCIL 402-4087 RADIO MAINT	\$109	\$0	100%	100.0%	\$109	\$0
WATER COUNCIL 402-4093 ONE-CALL	\$225	\$0	100%	100.0%	\$225	\$0
WATER COUNCIL 402-4094 DISPATCHING	\$7,379	\$0	100%	100.0%	\$7,379	\$0
WATER COUNCIL 402-4095 PROFESSIONAL FEES	\$13,866	\$0	100%	100.0%	\$13,866	\$0
WATER COUNCIL 402-4096 LEGAL	\$1,556	\$0	100%	100.0%	\$1,556	\$0
WATER COUNCIL 402-4097 ENGINEERING	\$14,611	\$0	100%	100.0%	\$14,611	\$0
WATER COUNCIL 402-4110 TRAINING	\$6,657	\$0	50%	100.0%	\$3,329	\$0
WATER COUNCIL 402-4113 ECONOMIC DIRECTOR	\$22,529	\$0	50%	100.0%	\$11,265	\$0
WATER COUNCIL 402-4114 BUILDING OFFICIAL	\$19,611	\$0	50%	100.0%	\$9,806	\$0
WATER COUNCIL 402-4115 MAPPING	\$20,752	\$0	100%	100.0%	\$20,752	\$0
WATER COUNCIL 402-4299 AUDIT	\$3,516	\$0	100%	100.0%	\$3,516	\$0
WATER COUNCIL 402-4300 BAD DEBT	\$2,437	\$0	100%	100.0%	\$2,437	\$0
WATER COUNCIL 402-4310 BOND INTEREST/FEES	\$992	\$0	100%	100.0%	\$992	\$0
WATER COUNCIL 402-4555 MISCELLANEOUS	\$0	\$0	100%	100.0%	\$0	\$0
Payment in Lieu of Taxes, 6% of Previous Years' Water Sales	\$0	\$0	100%	100.0%	\$0	\$0
Annual Payment to Repair & Replacement (Table 7)	\$45,133	\$135,398	100%	50.0%	\$45,133	\$67,699
User Charge Analysis Services	\$0	\$0	100%	100.0%	\$0	\$0
CIP Spending Plan (Table 5)	\$0	\$0	100%	100.0%	\$0	\$0
Grand Total All Costs	\$569,223	\$984,488			\$477,878	\$587,118
	\$1,553,711				\$1,064,995	
Marginal Fixed and Variable Cost Bases (For the Customer Type Listed Above)					Monthly Marginal Fixed Cost per Customer	Marginal Variable Cost per 100 Cu Ft
					\$19.05	
					Marginal Fixed Cost as a Percent of Total Fixed Cost:	
Marginal Variable Cost as a Percent of Total Variable Cost:						60%

Table 10 - Initial Rate Adjustments and Resulting Revenues

City of Higginsville, Missouri; Water Rates Scenario 2018-2

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

Out of City Multiplier	150%	Conservation Rate Block Multiplier	100%	Profit Multiplier	125%
7/1/18	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	\$25.13	Monthly, and the unit charge is	\$3.57	per 100 Cu Ft.	
After rate adjustments are made, customers will be billed monthly.					
Sales to be billed this year: 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 if the modeled rates are adopted. The grand total "blended" sales revenues are the total revenues generated by the two different sets of rates. Those revenues show in the right-most column.					

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Sales This Year at Current Rates	Customers at or Above This Volume and Below Next	Minimum Charge Base Rate Only1	New Usage Allowance in 100 Cu Ft	New Unit Charge per 100 Cu Ft	Sales This Year at Modeled Rates	Grand Total "Blended" Sales This Year
In City Residential (16 & 9)	0	99	\$63,305	201	\$12.63	0.000	\$3.57	\$24,480	\$87,785
	100	199	\$57,102	198	\$12.63	0.000	\$3.57	\$22,584	\$79,686
	200	499	\$123,387	679	\$12.63	0.000	\$3.57	\$56,622	\$180,009
	500	799	\$52,895	399	\$12.63	0.000	\$3.57	\$27,638	\$80,533
	800	999	\$14,395	105	\$12.63	0.000	\$3.57	\$7,408	\$21,802
	1,000	1,499	\$13,979	78	\$12.63	0.000	\$3.57	\$6,459	\$20,438
	1,500	1,999	\$5,068	19	\$12.63	0.000	\$3.57	\$2,047	\$7,115
	2,000	2,499	\$2,570	8	\$12.63	0.000	\$3.57	\$991	\$3,562
	2,500	2,999	\$1,429	4	\$12.63	0.000	\$3.57	\$536	\$1,964
	3,000	4,999	\$1,783	4	\$12.63	0.000	\$3.57	\$814	\$2,597
	5,000	7,499	\$717	1	\$12.63	0.000	\$3.57	\$311	\$1,028
	7,500	9,999	\$427	0	\$12.63	0.000	\$3.57	\$174	\$602
	10,000	19,999	\$1,099	0	\$12.63	0.000	\$3.57	\$446	\$1,545
	20,000	29,999	\$362	0	\$12.63	0.000	\$3.57	\$148	\$510
	30,000	49,999	\$35	0	\$12.63	0.000	\$3.57	\$16	\$52
	2,000,000	2,000,000	\$0	0	\$12.63	0.000	\$3.57	\$0	\$0
In City Non Residential (1, 2, 3, 13, 14, 15, 21)	0	99	\$11,413	103	\$12.63	0.000	\$3.57	\$6,498	\$17,911
	100	199	\$7,752	41	\$12.63	0.000	\$3.57	\$3,516	\$11,268
	200	499	\$15,900	54	\$12.63	0.000	\$3.57	\$6,266	\$22,165
	500	799	\$11,154	26	\$12.63	0.000	\$3.57	\$4,008	\$15,162
	800	999	\$6,009	12	\$12.63	0.000	\$3.57	\$2,110	\$8,119
	1,000	1,499	\$11,654	18	\$12.63	0.000	\$3.57	\$3,901	\$15,555
	1,500	1,999	\$9,083	11	\$12.63	0.000	\$3.57	\$2,961	\$12,045
	2,000	2,499	\$7,177	8	\$12.63	0.000	\$3.57	\$2,325	\$9,501
	2,500	2,999	\$5,856	5	\$12.63	0.000	\$3.57	\$1,838	\$7,694
	3,000	4,999	\$12,345	10	\$12.63	0.000	\$3.57	\$5,181	\$17,526
	5,000	7,499	\$10,494	5	\$12.63	0.000	\$3.57	\$4,318	\$14,812
	7,500	9,999	\$7,734	4	\$12.63	0.000	\$3.57	\$3,175	\$10,908
	10,000	19,999	\$15,310	6	\$12.63	0.000	\$3.57	\$6,245	\$21,555
	20,000	29,999	\$7,061	1	\$12.63	0.000	\$3.57	\$2,837	\$9,897
	30,000	49,999	\$9,932	1	\$12.63	0.000	\$3.57	\$3,967	\$13,899
	50,000	69,999	\$7,032	0	\$12.63	0.000	\$3.57	\$2,801	\$9,833
	70,000	99,999	\$8,609	0	\$12.63	0.000	\$3.57	\$3,478	\$12,087
	100,000	299,999	\$16,770	1	\$12.63	0.000	\$3.57	\$6,798	\$23,568
	2,000,000	2,000,000	\$0	0	\$12.63	0.000	\$3.57	\$0	\$0

Table 10 - Initial Rate Adjustments and Resulting Revenues

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Sales This Year at Current Rates	Customers at or Above This Volume and Below Next	Minimum Charge Base Rate Only1	New Usage Allowance in 100 Cu Ft	New Unit Charge per 100 Cu Ft	Sales This Year at Modeled Rates	Grand Total "Blended" Sales This Year
City (6)	0	99	\$88	11	\$0.00	0.000	\$2.66	\$79	\$167
	100	199	\$60	2	\$0.00	0.000	\$2.66	\$53	\$113
	200	499	\$106	3	\$0.00	0.000	\$2.66	\$95	\$201
	500	799	\$65	1	\$0.00	0.000	\$2.66	\$58	\$123
	800	999	\$29	0	\$0.00	0.000	\$2.66	\$26	\$55
	1,000	1,499	\$64	0	\$0.00	0.000	\$2.66	\$57	\$121
	1,500	1,999	\$57	0	\$0.00	0.000	\$2.66	\$51	\$108
	2,000	2,499	\$56	0	\$0.00	0.000	\$2.66	\$50	\$106
	2,500	2,999	\$50	0	\$0.00	0.000	\$2.66	\$45	\$95
	3,000	4,999	\$173	0	\$0.00	0.000	\$2.66	\$155	\$328
	5,000	7,499	\$74	1	\$0.00	0.000	\$2.66	\$66	\$140
	7,500	9,999	\$19	0	\$0.00	0.000	\$2.66	\$17	\$35
	10,000	19,999	\$75	0	\$0.00	0.000	\$2.66	\$67	\$142
	20,000	29,999	\$29	0	\$0.00	0.000	\$2.66	\$26	\$54
	2,000,000	2,000,000	\$0	0	\$0.00	0.000	\$2.66	\$0	\$0
No Charge (12)	0	99	\$0	1	\$0.00	0.000	\$0.00	\$0	\$0
	100	199	\$0	0	\$0.00	0.000	\$0.00	\$0	\$0
	200	499	\$0	1	\$0.00	0.000	\$0.00	\$0	\$0
	500	799	\$0	1	\$0.00	0.000	\$0.00	\$0	\$0
	800	999	\$0	1	\$0.00	0.000	\$0.00	\$0	\$0
	1,000	1,499	\$0	0	\$0.00	0.000	\$0.00	\$0	\$0
	2,000,000	2,000,000	\$0	0	\$0.00	0.000	\$0.00	\$0	\$0
Rural (4, 17)	0	99	\$2,002	6	\$12.63	0.000	\$5.36	\$763	\$2,765
	100	199	\$1,781	3	\$12.63	0.000	\$5.36	\$603	\$2,384
	200	499	\$4,012	13	\$12.63	0.000	\$5.36	\$1,562	\$5,574
	500	799	\$2,109	8	\$12.63	0.000	\$5.36	\$866	\$2,975
	800	999	\$779	2	\$12.63	0.000	\$5.36	\$294	\$1,073
	1,000	1,499	\$1,174	2	\$12.63	0.000	\$5.36	\$405	\$1,580
	1,500	1,999	\$832	1	\$12.63	0.000	\$5.36	\$263	\$1,094
	2,000	2,499	\$587	1	\$12.63	0.000	\$5.36	\$197	\$784
	2,500	2,999	\$394	1	\$12.63	0.000	\$5.36	\$129	\$523
	3,000	4,999	\$525	1	\$12.63	0.000	\$5.36	\$230	\$755
	5,000	7,499	\$295	0	\$12.63	0.000	\$5.36	\$120	\$415
	7,500	9,999	\$255	0	\$12.63	0.000	\$5.36	\$101	\$356
	10,000	19,999	\$321	0	\$12.63	0.000	\$5.36	\$135	\$455
	2,000,000	2,000,000	\$0	0	\$12.63	0.000	\$5.36	\$0	\$0

Table 10 - Initial Rate Adjustments and Resulting Revenues

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Sales This Year at Current Rates	Customers at or Above This Volume and Below Next	Minimum Charge Base Rate Only1	New Usage Allowance in 100 Cu Ft	New Unit Charge per 100 Cu Ft	Sales This Year at Modeled Rates	Grand Total "Blended" Sales This Year
PWSD, Towns, Hig Hab (18, 19, 20)	0	99	\$1,062	7	\$12.63	0.000	\$2.66	\$275	\$1,338
	100	199	\$26	0	\$12.63	0.000	\$2.66	\$8	\$34
	200	499	\$77	0	\$12.63	0.000	\$2.66	\$24	\$101
	500	799	\$77	0	\$12.63	0.000	\$2.66	\$24	\$101
	800	999	\$51	0	\$12.63	0.000	\$2.66	\$16	\$67
	1,000	1,499	\$128	0	\$12.63	0.000	\$2.66	\$40	\$169
	1,500	1,999	\$128	0	\$12.63	0.000	\$2.66	\$40	\$169
	2,000	2,499	\$128	0	\$12.63	0.000	\$2.66	\$40	\$169
	2,500	2,999	\$128	0	\$12.63	0.000	\$2.66	\$40	\$169
	3,000	4,999	\$513	0	\$12.63	0.000	\$2.66	\$161	\$674
	5,000	7,499	\$642	0	\$12.63	0.000	\$2.66	\$201	\$843
	7,500	9,999	\$642	0	\$12.63	0.000	\$2.66	\$201	\$843
	10,000	19,999	\$2,567	0	\$12.63	0.000	\$2.66	\$805	\$3,372
	20,000	29,999	\$2,567	0	\$12.63	0.000	\$2.66	\$805	\$3,372
	30,000	49,999	\$5,134	0	\$12.63	0.000	\$2.66	\$1,610	\$6,744
	50,000	69,999	\$5,134	0	\$12.63	0.000	\$2.66	\$1,610	\$6,744
	70,000	99,999	\$7,701	0	\$12.63	0.000	\$2.66	\$2,415	\$10,116
	100,000	299,999	\$51,339	0	\$12.63	0.000	\$2.66	\$16,099	\$67,438
	300,000	499,999	\$51,339	0	\$12.63	0.000	\$2.66	\$16,099	\$67,438
	500,000	666,667	\$42,783	0	\$12.63	0.000	\$2.66	\$13,416	\$56,199
	666,668	699,999	\$4,022	0	\$12.63	0.000	\$2.66	\$2,462	\$6,483
	700,000	833,332	\$11,528	0	\$12.63	0.000	\$2.66	\$7,064	\$18,591
	833,333	899,999	\$2,738	0	\$12.63	0.000	\$2.66	\$1,927	\$4,665
	900,000	1,099,999	\$1,766	0	\$12.63	0.000	\$2.66	\$1,246	\$3,013
	2,000,000	2,000,000	\$0	0	\$12.63	0.000	\$2.66	\$0	\$0

Table 10 - Initial Rate Adjustments and Resulting Revenues

Customer Class, Rate Class or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Sales This Year at Current Rates	Customers at or Above This Volume and Below Next	Minimum Charge Base Rate Only1	New Usage Allowance in 100 Cu Ft	New Unit Charge per 100 Cu Ft	Sales This Year at Modeled Rates	Grand Total "Blended" Sales This Year
Wholesale (5, 7, 8 10, 11)	0	99	\$126	2	\$12.63	0.000	\$2.66	\$101	\$227
	100	199	\$77	0	\$12.63	0.000	\$2.66	\$24	\$101
	200	499	\$231	0	\$12.63	0.000	\$2.66	\$72	\$303
	500	799	\$231	0	\$12.63	0.000	\$2.66	\$72	\$303
	800	999	\$154	0	\$12.63	0.000	\$2.66	\$48	\$202
	1,000	1,499	\$385	0	\$12.63	0.000	\$2.66	\$121	\$506
	1,500	1,999	\$385	0	\$12.63	0.000	\$2.66	\$121	\$506
	2,000	2,499	\$385	0	\$12.63	0.000	\$2.66	\$121	\$506
	2,500	2,999	\$385	0	\$12.63	0.000	\$2.66	\$121	\$506
	3,000	4,999	\$1,540	0	\$12.63	0.000	\$2.66	\$483	\$2,023
	5,000	7,499	\$1,925	0	\$12.63	0.000	\$2.66	\$604	\$2,529
	7,500	9,999	\$1,925	0	\$12.63	0.000	\$2.66	\$604	\$2,529
	10,000	19,999	\$7,701	0	\$12.63	0.000	\$2.66	\$2,415	\$10,116
	20,000	29,999	\$7,701	0	\$12.63	0.000	\$2.66	\$2,415	\$10,116
	30,000	49,999	\$14,385	1	\$12.63	0.000	\$2.66	\$4,531	\$18,916
	50,000	69,999	\$10,673	0	\$12.63	0.000	\$2.66	\$3,357	\$14,030
	70,000	99,999	\$6,333	1	\$12.63	0.000	\$2.66	\$3,907	\$10,240
	100,000	299,999	\$25,498	1	\$12.63	0.000	\$2.66	\$15,676	\$41,175
	300,000	499,999	\$3,386	1	\$12.63	0.000	\$2.66	\$2,095	\$5,481
	2,000,000	2,000,000	\$0	0	\$12.63	0.000	\$2.66	\$0	\$0
Total Rate Revenue at Current Rates			\$811,492	Total Rate Revenue at Modeled Rates				\$332,929	
Prorated capacity surcharges from Table 13 (minimum charges above do not include them)									\$10,299

Total Blended Rate Revenues for the Year ² \$1,154,720

Note 1, New Minimum Charge Base Rates: If meter or connection 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 or connection size surcharges as calculated in Table 13. Otherwise, use the rates in the "Total Minimum Charge per Billing Period" column of Table 13 when setting minimum charges for each customer when their minimums will be based upon meter or connection size.

Note 2, Blended Rate Revenues: During the year when rates will be adjusted, rate revenues generated will be "blended" revenues - part collected at the current rates and part collected at the adjusted rates. The table above calculates both kinds of revenue and totals them in the right-most column. Therefore, the anticipated timing of rate adjustment shown at the top of this table will cause rates to be charged as follows:

9.0	months at the old user charge rates	and	3.0	months at the new user charge rates.
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Table 11 - Capacity Costs

City of Higginsville, Missouri; Water Rates Scenario 2018-2

System capacity and connection costs WILL be recovered in one way by default, or a combination of ways by design. That could be through regular user fees, in which case existing customers pay the costs to bring on new customers. It could be through system development or connection fees, in which case new customers pay "up front" for the capacity they are granted. It could be through on-going capacity surcharges added to minimum charges, preferably based on meter or connection size, in which case each customer pays for the capacity they are granted over time. Or, it could be by a combination of these. This table shows capacity costs to expect. From these costs, system development fees and surcharges were developed in Table 12 and Table 13, respectively.

Peak and Base Flow Capacity Costs

	Fixed Assets Original Value (Capacity Cost)	% of Value Attributable to Peak Flow Capacity	Peak Flow Capacity Cost	Annual Peak Flow Capacity Cost (40-year Depreciation)	% of Value Attributable to Base Flow Capacity	Base Flow Capacity Cost	Annual Base Flow Capacity Cost (40-year Depreciation)
Totals	\$11,217,487	25.0%	\$2,804,372	\$163,434	75.0%	\$8,413,115	\$490,301

How Capacity Costs Will Be Recovered

These costs are modeled to be recovered from system development fees in Table 12

Peak Flow Capacity Costs to be Recovered by System Development Fees

0.64% Target Percentage of Costs to Recover
 \$1,038 Target Portion of Costs to Recover
 \$400 Resulting Peak Capacity Cost per Share

Base Flow Capacity Costs to be Recovered by System Development Fees

0.0% Target Percentage of Costs to Recover
 \$0 Target Portion of Costs to Recover
 \$0 Resulting Base Capacity Cost per Share

In addition to calculation of the capacity cost for each new connection based on the unit cost above, the system development fee for each new connection should also include recovery of the following costs:

\$100 Average Field Cost per New Connection
 \$50 Average Administration Cost per New Connection
 \$150 Sum of Admin and Field Costs (to Make New Connections)

These costs are modeled to be recovered from minimum charge surcharges in Table 13

Peak Flow Capacity Costs to be Recovered by Minimum Charge Surcharges

25.00% Target Percentage of Costs to Recover
 \$40,858 Target Portion of Costs to Recover
 \$14.90 Resulting Capacity Surcharge per Share of Peak Flow Capacity

Base Flow Capacity Costs to be Recovered by Minimum Charge Surcharges

0.0% Target Percentage of Costs to Recover
 \$0 Target Portion of Costs to Recover
 \$0.00 Resulting Capacity Surcharge per Share of Base Flow Capacity

Note: Non-capital costs, such as field costs for inspection of connections and administration costs, should be recovered by fees charged for providing the services involved. These costs are in addition to peak flow capacity costs.

Table 11B - Safe Operating Capacities by Meter Size

City of Higginsville, Missouri; Water Rates Scenario 2018-2

Data source: Table VII.2-5, page 338, AWWA Manual M1 Principles of Water Rates, Fees and Charges, Seventh Edition

This table calculates the meter equivalent ratio, which is used for calculating peak flow capacity-based system development fees and system development surcharges in Tables 12 and 13.

Meter Size, in Inches	Meter Type	Maximum-Rated Safe Operating Flow, in gallons per minute	Meter Equivalent Ratio (Capacity Shares)
Five Eighths	Displacement	20	1.0
Three Quarters	Displacement	30	1.5
One Inch	Displacement	50	2.5
One & a Half Inch	Displacement	100	5.0
Two Inch	Displacement	160	8.0
Three	Singlet	320	16.0
Three	Compound, Class I	320	16.0
Three	Turbine, Class I	350	17.5
Four	Singlet	500	25.0
Four	Compound, Class I	500	25.0
Four	Turbine, Class I	630	31.0
Six	Singlet	1,000	50.0
Six	Compound, Class I	1,000	50.0
Six	Turbine, Class I	1,300	65.0
Eight	Compound, Class I	1,600	80.0
Eight	Turbine, Class I	2,800	140.0
Ten	Turbine, Class II	4,200	210.0
Twelve	Turbine, Class II	5,300	265.0

Table 12 - System Development Fees Based on Meter Size

City of Higginsville, Missouri; Water Rates Scenario 2018-2

This table calculates system development fees to charge each meter size. Based on growth during the "Analysis Year," (see Table 3), it also calculates total fee revenues that would be generated during one full year at these fees.

Note: Larger meter sizes are available in two of more types that have 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.

		Peak Flow Capacity Fees										Base Flow Capacity, New Customer Hookup Administration and Connection Fees										System Development Fee for Each Meter Size	Grand Total System Development Fees for One Full Year
Meter Size	Meter Type	Meter Size in Inches	Water Size in Square Inches	Max of New Taps in a Typical Year	Water Size in Square Inches	AWWA Capacity "Spill" Factor Compared to 55 inch Meter	Projected Annual Growth in Capacity Shares	Surcharge Rate for Out of City Peak Capacity Costs	Economy of Scale Adjustment to Peak Capacity Costs	Uniform Adjustment to Peak Capacity Cost	Peak Capacity Cost per Share, Including Uniform and Other Adjustments	Total Peak System Development Fees to Collect in One Year, Each Meter Size Class	Peak System Development Fee, Each Meter Size	Sum of Admin and Field Costs (to Make New Connections)	Base Capacity Cost per Share to Recover, Adjusted for Economy of Scale and Out of Service Area Status	Uniform Adjustment to Base Capacity Cost	Base Capacity Cost to Recover With Each New Connection	Total Base Capacity and Field Costs, Each Meter Size Class	Total Admin Costs, Each Meter Size Class	Total System Development Fees to Collect in One Year, Each Meter Size Class			
In-City Customers																							
Five Eighths	Displacement	0.625	0.307	1.8563	0.3	1.0	1.8563	100%	100%	\$0.00	\$400	\$743	\$400	\$150	\$0	\$0.00	\$150	\$278	\$278	\$557	\$550	\$1,300	
Three Quarters	Displacement	0.750	0.442	0.0274	0.4	1.0	0.0274	100%	100%	\$0.00	\$400	\$11	\$400	\$150	\$0	\$0.00	\$150	\$4	\$4	\$8	\$550	\$19	
One Inch	Displacement	1.000	0.785	0.0548	0.8	2.5	0.1371	100%	100%	\$0.00	\$400	\$55	\$1,000	\$150	\$0	\$0.00	\$150	\$8	\$8	\$16	\$1,150	\$71	
One & a Half Inch	Displacement	1.500	1.767	0.0113	1.8	5.0	0.0567	100%	100%	\$0.00	\$400	\$23	\$2,001	\$150	\$0	\$0.00	\$150	\$2	\$2	\$3	\$2,151	\$26	
Two Inch	Displacement	2.000	3.142	0.0378	3.1	8.0	0.3026	100%	100%	\$0.00	\$400	\$121	\$3,201	\$150	\$0	\$0.00	\$150	\$6	\$6	\$11	\$3,351	\$132	
Two & a Half Inch	Displacement	2.500	4.909	0.0000	4.9	12.5	0.0000	100%	100%	\$0.00	\$400	\$0	\$5,001	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$5,151	\$0	
Three Inch	Single	3.000	7.069	0.0104	7.1	16.0	0.1664	100%	100%	\$0.00	\$400	\$67	\$6,402	\$150	\$0	\$0.00	\$150	\$2	\$2	\$3	\$6,552	\$70	
Three Inch	Compound, Class I	3.000	7.069	0.0000	7.1	16.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$6,402	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$6,552	\$0	
Three Inch	Turbine, Class I	3.000	7.069	0.0000	7.1	17.5	0.0000	100%	100%	\$0.00	\$400	\$0	\$7,002	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$7,152	\$0	
Four Inch	Single	4.000	12.566	0.0019	12.6	25.0	0.0473	100%	100%	\$0.00	\$400	\$19	\$10,003	\$150	\$0	\$0.00	\$150	\$0	\$0	\$1	\$10,153	\$19	
Four Inch	Compound, Class I	4.000	12.566	0.0000	12.6	25.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$10,003	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$10,153	\$0	
Four Inch	Turbine, Class I	4.000	12.566	0.0000	12.6	31.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$12,403	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$12,553	\$0	
Six Inch	Single	6.000	28.274	0.0000	28.3	50.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$20,006	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$20,156	\$0	
Six Inch	Compound, Class I	6.000	28.274	0.0000	28.3	50.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$20,006	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$20,156	\$0	
Six Inch	Turbine, Class I	6.000	28.274	0.0000	28.3	65.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$28,007	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$28,157	\$0	
Eight Inch	Compound, Class I	8.000	50.266	0.0000	50.3	80.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$32,006	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$32,156	\$0	
Eight Inch	Turbine, Class I	8.000	50.266	0.0000	50.3	140.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$68,014	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$68,164	\$0	
Ten Inch	Turbine, Class II	10.000	78.540	0.0000	78.5	210.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$84,021	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$84,171	\$0	
Twelve Inch	Turbine, Class II	12.000	113.098	0.0000	113.1	265.0	0.0000	100%	100%	\$0.00	\$400	\$0	\$106,027	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$106,177	\$0	
Subtotals		2.0000					2.5939					\$1,038						\$300	\$300	\$600		\$1,638	
Out of City Customers																							
Five Eighths	Displacement	0.625	0.307	0.0000	0.3	1.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$600	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$750	\$0	
Three Quarters	Displacement	0.750	0.442	0.0000	0.4	1.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$600	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$750	\$0	
One Inch	Displacement	1.000	0.785	0.0000	0.8	2.5	0.0000	150%	100%	\$0.00	\$600	\$0	\$1,600	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$1,650	\$0	
One & a Half Inch	Displacement	1.500	1.767	0.0000	1.8	5.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$3,001	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$3,151	\$0	
Two Inch	Displacement	2.000	3.142	0.0000	3.1	8.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$4,801	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$4,951	\$0	
Two & a Half Inch	Displacement	2.500	4.909	0.0000	4.9	12.5	0.0000	150%	100%	\$0.00	\$600	\$0	\$7,502	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$7,652	\$0	
Three Inch	Single	3.000	7.069	0.0000	7.1	16.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$9,602	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$9,752	\$0	
Three Inch	Compound, Class I	3.000	7.069	0.0000	7.1	16.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$9,602	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$9,752	\$0	
Three Inch	Turbine, Class I	3.000	7.069	0.0000	7.1	17.5	0.0000	150%	100%	\$0.00	\$600	\$0	\$10,503	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$10,653	\$0	
Four Inch	Single	4.000	12.566	0.0000	12.6	25.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$15,004	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$15,154	\$0	
Four Inch	Compound, Class I	4.000	12.566	0.0000	12.6	25.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$15,004	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$15,154	\$0	
Four Inch	Turbine, Class I	4.000	12.566	0.0000	12.6	31.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$18,606	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$18,756	\$0	
Six Inch	Single	6.000	28.274	0.0000	28.3	50.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$30,006	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$30,156	\$0	
Six Inch	Compound, Class I	6.000	28.274	0.0000	28.3	50.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$30,006	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$30,156	\$0	
Six Inch	Turbine, Class I	6.000	28.274	0.0000	28.3	65.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$39,010	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$39,160	\$0	
Eight Inch	Compound, Class I	8.000	50.266	0.0000	50.3	80.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$48,012	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$48,162	\$0	
Eight Inch	Turbine, Class I	8.000	50.266	0.0000	50.3	140.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$84,021	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$84,171	\$0	
Ten Inch	Turbine, Class II	10.000	78.540	0.0000	78.5	210.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$128,032	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$128,182	\$0	
Twelve Inch	Turbine, Class II	12.000	113.098	0.0000	113.1	265.0	0.0000	150%	100%	\$0.00	\$600	\$0	\$159,040	\$150	\$0	\$0.00	\$150	\$0	\$0	\$0	\$159,190	\$0	
Subtotals		0.0000					0.0000											\$0	\$0	\$0		\$0	
Total		2.0000					2.5939					\$1,038						\$300	\$300	\$600		\$1,638	

Notes:

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.

³ Economy of Scale Discount Rate - This factor is used to slow the rate at which connection fees rise relative to the AWWA factors because costs to build capacity for larger facilities do not rise as rapidly as the AWWA volume factors rise. Or, if the system simply wants to slow the rate of fee increases as meter size rises, it is done with this factor.

Because growth rates and meter sizes to be installed in future years cannot be predicted with certainty, tap fee revenues are also uncertain. However, the projections above are based upon historical growth and meter sizes so they should be reasonable estimates. Generally, tap fees should only be used to pay for capital improvements, so as those costs become better known, fees can be adjusted accordingly.

Table 13 - Capacity Surcharges Based on Meter Size

City of Higginsville, Missouri, Water Rates Scenario 2018-2

This table depicts minimum charges that are commensurate with the potential of each customer, based on their connection or meter size, to place flow demands on the system.

Note: Larger meter sizes are available in two of more types that have 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 Type	Meter Size in Inches	Meter Size in Square Inches	AWWA Capacity "Share" Factor Compared to 5/8 Inch Meter	Footcandle	Current Number Meters This Size	Total Capacity Shares Attributable to Each Meter Size Group	Capacity Cost per Meter per Billing Period	Economy of Scale Adjustment to Peak and Base Capacity Costs	Surcharge Rate for Out of City Peak and Base Capacity Costs	Final Capacity Cost per Meter per Billing Period	Uniform Adjustment to Base Minimum Charge	Adjusted Base Minimum Charge	Total Surcharged Minimum Charge per Billing Period ³	Total Annual Capacity Surcharges for Each Meter Size	Snow Bird Fee
In-City Customers																
Five Eighths	Displacement	0.625	0.307	1.0		1,963	1,963	\$1.24	100%	100%	\$1.24	-\$12.50	\$12.63	\$13.87	\$29,240	\$11.84
Three Quarters	Displacement	0.750	0.442	1.0	¹	29	29	\$1.24	100%	100%	\$1.24	-\$12.50	\$12.63	\$13.87	\$432	\$11.84
One Inch	Displacement	1.000	0.785	2.5		58	145	\$3.10	100%	100%	\$3.10	-\$12.50	\$12.63	\$15.73	\$2,160	\$13.71
One & a Half Inch	Displacement	1.500	1.767	5.0		12	60	\$6.21	100%	100%	\$6.21	-\$12.50	\$12.63	\$18.83	\$894	\$16.81
Two Inch	Displacement	2.000	3.142	8.0		40	320	\$9.93	100%	100%	\$9.93	-\$12.50	\$12.63	\$22.56	\$4,767	\$20.53
Two & a Half Inch	Displacement	2.500	4.909	12.5	²	0	0	\$15.52	100%	100%	\$15.52	-\$12.50	\$12.63	\$28.14	\$0	\$26.12
Three Inch	Singlet	3.000	7.069	16.0		11	176	\$19.86	100%	100%	\$19.86	-\$12.50	\$12.63	\$32.49	\$2,622	\$30.46
Three Inch	Compound, Class I	3.000	7.069	16.0		0	0	\$19.86	100%	100%	\$19.86	-\$12.50	\$12.63	\$32.49	\$0	\$30.46
Three Inch	Turbine, Class I	3.000	7.069	17.5		0	0	\$21.72	100%	100%	\$21.72	-\$12.50	\$12.63	\$34.35	\$0	\$32.32
Four Inch	Singlet	4.000	12.566	25.0		2	50	\$31.03	100%	100%	\$31.03	-\$12.50	\$12.63	\$43.66	\$745	\$41.63
Four Inch	Compound, Class I	4.000	12.566	25.0		0	0	\$31.03	100%	100%	\$31.03	-\$12.50	\$12.63	\$43.66	\$0	\$41.63
Four Inch	Turbine, Class I	4.000	12.566	31.0		0	0	\$38.48	100%	100%	\$38.48	-\$12.50	\$12.63	\$51.11	\$0	\$49.08
Six Inch	Singlet	6.000	28.274	50.0		0	0	\$62.06	100%	100%	\$62.06	-\$12.50	\$12.63	\$74.69	\$0	\$72.67
Six Inch	Compound, Class I	6.000	28.274	50.0		0	0	\$62.06	100%	100%	\$62.06	-\$12.50	\$12.63	\$74.69	\$0	\$72.67
Six Inch	Turbine, Class I	6.000	28.274	65.0		0	0	\$80.68	100%	100%	\$80.68	-\$12.50	\$12.63	\$93.31	\$0	\$91.29
Eight Inch	Compound, Class I	8.000	50.266	80.0		0	0	\$99.30	100%	100%	\$99.30	-\$12.50	\$12.63	\$111.93	\$0	\$109.91
Eight Inch	Turbine, Class I	8.000	50.266	140.0		0	0	\$173.78	100%	100%	\$173.78	-\$12.50	\$12.63	\$186.41	\$0	\$184.38
Ten Inch	Turbine, Class II	10.000	78.540	210.0		0	0	\$260.67	100%	100%	\$260.67	-\$12.50	\$12.63	\$273.30	\$0	\$271.27
Twelve Inch	Turbine, Class II	12.000	113.098	265.0		0	0	\$328.94	100%	100%	\$328.94	-\$12.50	\$12.63	\$341.57	\$0	\$339.54
Subtotals						2,115	2,743								\$40,858	
Out of City Customers																
Five Eighths	Displacement	0.625	0.307	1.0		0	0	\$1.24	100%	150%	\$1.86	-\$12.50	\$18.94	\$20.80	\$0	\$17.76
Three Quarters	Displacement	0.750	0.442	1.0	¹	0	0	\$1.24	100%	150%	\$1.86	-\$12.50	\$18.94	\$20.80	\$0	\$17.76
One Inch	Displacement	1.000	0.785	2.5		0	0	\$3.10	100%	150%	\$4.65	-\$12.50	\$18.94	\$23.60	\$0	\$20.56
One & a Half Inch	Displacement	1.500	1.767	5.0		0	0	\$6.21	100%	150%	\$9.31	-\$12.50	\$18.94	\$28.25	\$0	\$25.21
Two Inch	Displacement	2.000	3.142	8.0		0	0	\$9.93	100%	150%	\$14.90	-\$12.50	\$18.94	\$33.84	\$0	\$30.80
Two & a Half Inch	Displacement	2.500	4.909	12.5	²	0	0	\$15.52	100%	150%	\$23.27	-\$12.50	\$18.94	\$42.22	\$0	\$39.18
Three Inch	Singlet	3.000	7.069	16.0		0	0	\$19.86	100%	150%	\$29.79	-\$12.50	\$18.94	\$48.73	\$0	\$45.69
Three Inch	Compound, Class I	3.000	7.069	16.0		0	0	\$19.86	100%	150%	\$29.79	-\$12.50	\$18.94	\$48.73	\$0	\$45.69
Three Inch	Turbine, Class I	3.000	7.069	17.5		0	0	\$21.72	100%	150%	\$32.58	-\$12.50	\$18.94	\$51.53	\$0	\$48.45
Four Inch	Singlet	4.000	12.566	25.0		0	0	\$31.03	100%	150%	\$46.55	-\$12.50	\$18.94	\$65.49	\$0	\$62.45
Four Inch	Compound, Class I	4.000	12.566	25.0		0	0	\$31.03	100%	150%	\$46.55	-\$12.50	\$18.94	\$65.49	\$0	\$62.45
Four Inch	Turbine, Class I	4.000	12.566	31.0		0	0	\$38.48	100%	150%	\$57.72	-\$12.50	\$18.94	\$76.66	\$0	\$73.62
Six Inch	Singlet	6.000	28.274	50.0		0	0	\$62.06	100%	150%	\$93.10	-\$12.50	\$18.94	\$112.04	\$0	\$109.00
Six Inch	Compound, Class I	6.000	28.274	50.0		0	0	\$62.06	100%	150%	\$93.10	-\$12.50	\$18.94	\$112.04	\$0	\$109.00
Six Inch	Turbine, Class I	6.000	28.274	65.0		0	0	\$80.68	100%	150%	\$121.03	-\$12.50	\$18.94	\$139.97	\$0	\$136.93
Eight Inch	Compound, Class I	8.000	50.266	80.0		0	0	\$99.30	100%	150%	\$148.96	-\$12.50	\$18.94	\$167.90	\$0	\$164.86
Eight Inch	Turbine, Class I	8.000	50.266	140.0		0	0	\$173.78	100%	150%	\$260.67	-\$12.50	\$18.94	\$279.61	\$0	\$276.57
Ten Inch	Turbine, Class II	10.000	78.540	210.0		0	0	\$260.67	100%	150%	\$391.01	-\$12.50	\$18.94	\$409.95	\$0	\$406.91
Twelve Inch	Turbine, Class II	12.000	113.098	265.0		0	0	\$328.94	100%	150%	\$493.41	-\$12.50	\$18.94	\$512.36	\$0	\$509.32
Subtotals						0	0								\$0	
Total						2,115	2,743								\$40,858	

Notes

Meter count data did not show how many meters of each size are located in city versus out of city. Therefore, it was assumed, for revenue calculation purposes, that all are in-city and assessed fees at the lower, in-city rates.

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.

³ Economy of Scale Discount Rate - This factor is used to slow the rate at which connection fees rise relative to the AWWA factors because costs to build capacity for larger facilities do not rise as rapidly as the AWWA volume factors rise. Or, if the system simply wants to slow the rate of fee increases as meter size rises, it is done with this factor.

⁴ Total Surcharged Minimum Charge per Billing Period - If minimum charge fees are to be based upon meter size, use the charges in this column if they are different from those in Table 1.

⁵ Total Annual Capacity Surcharges for Each Meter Size - The sum at the bottom of this column is the dollar amount that meter size-based surcharges will generate in one full year.

Table 14 - Financial Capacity Indicators and Reserves
City of Higginsville, Missouri; Water Rates Scenario 2018-2

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.

	Test Year Starting	Analysis (This) 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
	10/1/16	10/1/17	10/1/18	10/1/19	10/1/20	10/1/21	10/1/22	10/1/23	10/1/24	10/1/25	10/1/26	10/1/27
Capacity Indicators												
Equivalent Final Monthly Bill for a 5,000 gal per Month Residential Customer	\$30.69	\$37.73	\$39.05	\$40.42	\$41.84	\$43.30	\$44.82	\$46.38	\$48.01	\$49.69	\$51.43	\$53.23
Annual Median Household Income (AMHI) Within Service Area	\$50,033	\$51,873	\$53,781	\$55,759	\$57,810	\$59,937	\$62,141	\$64,427	\$66,797	\$69,253	\$71,801	\$74,442
Affordability Index:												
Current Rates First Column, Then Proposed Rates	0.74%	0.87%	0.87%	0.87%	0.87%	0.87%	0.87%	0.86%	0.86%	0.86%	0.86%	0.86%

Affordability Index (AI) goes to the willingness and ability of customers to pay. AI is the percent of AMHI needed by a 5,000 gallon per month residential user to pay their bill. Rates near 1.0% are common in the U.S. and are generally considered affordable. Federal grant agencies generally will not consider awarding grants if this indicator is less than 2.0%. The above index is only for a 1 share customers but it should be fairly representative of all residential customers.

Estimated Operating Ratio:	1.06	1.03	1.06	1.06	1.06	1.07	1.08	1.07	1.09	1.09	1.09	1.10
Current Rates First Column, Then Proposed Rates												

Operating ratio (OR) goes to the ability of the utility to pay its operating expenses. 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 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 the OR implies.

Estimated Coverage Ratio:	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	0.54	0.71	0.76	0.75	0.94
Current Rates First Column, Then Proposed Rates												

Coverage Ratio (CR) goes to the ability of the utility to pay its debt payments. CR applies only to years with debt service. 1.0 is break even. Generally, the CR should be at least 1.25. Note: If the utility has or will have reserves (below,) it has more ability to make debt payments than the CR implies.

	Balance Ending on 9/30/16	Balance Ending on 9/30/17	Balance Ending on 9/30/18	Balance Ending on 9/30/19	Balance Ending on 9/30/20	Balance Ending on 9/30/21	Balance Ending on 9/30/22	Balance Ending on 9/30/23	Balance Ending on 9/30/24	Balance Ending on 9/30/25	Balance Ending on 9/30/26	Balance Ending on 9/30/27	Balance Ending on 9/30/28
Reserves													
Cash and Cash Equivalents	\$174,559	\$243,480	\$278,808	\$363,211	\$446,675	\$532,204	\$546,619	\$562,925	\$583,813	\$597,330	\$615,476	\$638,687	\$653,786
Other Liquid Assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Undedicated Cash Assets, Before Inflation	\$174,559	\$243,480	\$278,808	\$363,211	\$446,675	\$532,204	\$546,619	\$562,925	\$583,813	\$597,330	\$615,476	\$638,687	\$653,786
Total Cash Assets Discounted for Inflation (Future Unrestricted Purchasing Power)	\$174,559	\$243,480	\$278,808	\$352,315	\$420,277	\$485,728	\$483,918	\$483,403	\$486,300	\$482,632	\$482,376	\$485,550	\$497,028
Repair & Replacement	\$0	-\$122,785	-\$71,179	-\$22,335	\$23,578	\$66,384	\$105,900	\$141,936	\$174,295	\$202,770	\$227,149	\$247,210	\$262,721
Debt Service and CIP Reserves	\$0	\$0	\$0	\$0	\$0	\$0	\$94,305	\$201,171	\$119,151	\$67,779	\$24,645	-\$22,584	-\$35,142
Sum of All Reserves	\$174,559	\$120,695	\$207,629	\$340,876	\$470,253	\$598,587	\$746,824	\$906,032	\$877,258	\$867,879	\$867,271	\$863,313	\$881,365

Table 15 - Comparison of Bills Before and After Rate Adjustments

City of Higginsville, Missouri; Water Rates Scenario 2018-2

The <u>weighted-average</u> bill increase for all customers combined will be					20.3%		
Bill changes for individual customers and example volumes of use are as shown below.							
Customer or Rate Class, or Meter Size	Cu Ft of Use	Customers at or Above This Volume and Below Next	Cumulative Customers	Current Bill for This Volume	Modeled Bill for This Volume	Bill Increase or Decrease (-)	Percent Increase or Decrease (-)
In City Residential (16 & 9)	0	201	201	\$2.75	\$12.63	\$9.88	359%
	100	198	399	\$6.93	\$16.20	\$9.27	134%
	200	679	1,078	\$11.11	\$19.77	\$8.66	78%
	500	399	1,477	\$23.65	\$30.48	\$6.83	29%
	800	105	1,582	\$36.19	\$41.19	\$5.00	14%
	1,000	78	1,661	\$44.55	\$48.33	\$3.78	8%
	1,500	19	1,680	\$65.45	\$66.18	\$0.73	1%
	2,000	8	1,688	\$86.35	\$84.03	-\$2.32	-3%
	2,500	4	1,692	\$107.25	\$101.88	-\$5.37	-5%
	3,000	4	1,695	\$122.40	\$119.73	-\$2.67	-2%
	5,000	1	1,696	\$183.00	\$191.13	\$8.13	4%
	7,500	0	1,696	\$258.75	\$280.38	\$21.63	8%
	10,000	0	1,697	\$334.50	\$369.63	\$35.13	11%
	20,000	0	1,697	\$637.50	\$726.63	\$89.13	14%
In City Non Residential (1, 2, 3, 13, 14, 15, 21)	0	103	103	\$2.75	\$12.63	\$9.88	359%
	100	41	145	\$2.75	\$16.20	\$13.45	489%
	200	54	199	\$2.75	\$19.77	\$17.02	619%
	500	26	225	\$2.75	\$30.48	\$27.73	1008%
	800	12	237	\$11.11	\$41.19	\$30.08	271%
	1,000	18	255	\$19.47	\$48.33	\$28.86	148%
	1,500	11	266	\$40.37	\$66.18	\$25.81	64%
	2,000	8	274	\$61.27	\$84.03	\$22.76	37%
	2,500	5	279	\$82.17	\$101.88	\$19.71	24%
	3,000	10	289	\$97.32	\$119.73	\$22.41	23%
	5,000	5	294	\$157.92	\$191.13	\$33.21	21%
	7,500	4	298	\$233.67	\$280.38	\$46.71	20%
	10,000	6	304	\$309.42	\$369.63	\$60.21	19%
	20,000	1	305	\$612.42	\$726.63	\$114.21	19%
	30,000	1	306	\$915.42	\$1,083.63	\$168.21	18%
	50,000	0	306	\$1,521.42	\$1,797.63	\$276.21	18%
	70,000	0	306	\$2,117.42	\$2,511.63	\$394.21	19%
	100,000	1	307	\$3,011.42	\$3,582.63	\$571.21	19%

Table 15 - Comparison of Bills Before and After Rate Adjustments

Customer or Rate Class, or Meter Size	Cu Ft of Use	Customers at or Above This Volume and Below Next	Cumulative Customers	Current Bill for This Volume	Modeled Bill for This Volume	Bill Increase or Decrease ()	Percent Increase or Decrease (-)
City (6)	0	11	11	\$0.00	\$0.00	\$0.00	N.A.
	100	2	13	\$1.00	\$2.66	\$1.66	166%
	200	3	16	\$2.00	\$5.32	\$3.32	166%
	500	1	17	\$5.00	\$13.31	\$8.31	166%
	800	0	17	\$8.00	\$21.29	\$13.29	166%
	1,000	0	18	\$10.00	\$26.61	\$16.61	166%
	1,500	0	18	\$15.00	\$39.92	\$24.92	166%
	2,000	0	18	\$20.00	\$53.23	\$33.23	166%
	2,500	0	18	\$25.00	\$66.53	\$41.53	166%
	3,000	0	18	\$30.00	\$79.84	\$49.84	166%
	5,000	1	19	\$50.00	\$133.06	\$83.06	166%
No Charge (12)	0	1	1	\$0.00	\$0.00	\$0.00	N.A.
	100	0	1	\$0.00	\$0.00	\$0.00	N.A.
	200	1	2	\$0.00	\$0.00	\$0.00	N.A.
	500	1	2	\$0.00	\$0.00	\$0.00	N.A.
	800	1	3	\$0.00	\$0.00	\$0.00	N.A.
	1,000	0	3	\$0.00	\$0.00	\$0.00	N.A.
	1,500	0	3	\$0.00	\$0.00	\$0.00	N.A.
	2,000	0	3	\$0.00	\$0.00	\$0.00	N.A.
Rural (4, 17)	0	6	6	\$2.75	\$12.63	\$9.88	359%
	100	3	9	\$9.02	\$17.98	\$8.96	99%
	200	13	22	\$15.29	\$23.34	\$8.05	53%
	500	8	30	\$34.10	\$39.40	\$5.30	16%
	800	2	33	\$52.91	\$55.47	\$2.56	5%
	1,000	2	35	\$65.45	\$66.18	\$0.73	1%
	1,500	1	36	\$96.80	\$92.95	-\$3.85	-4%
	2,000	1	36	\$128.15	\$119.73	-\$8.42	-7%
	2,500	1	37	\$159.50	\$146.50	-\$13.00	-8%
	3,000	1	38	\$182.20	\$173.28	-\$8.92	-5%
	5,000	0	38	\$273.00	\$280.38	\$7.38	3%
	7,500	0	38	\$386.50	\$414.25	\$27.75	7%
	10,000	0	38	\$500.00	\$548.13	\$48.13	10%

Table 15 - Comparison of Bills Before and After Rate Adjustments

Customer or Rate Class, or Meter Size	Cu Ft of Use	Customers at or Above This Volume and Below Next	Cumulative Customers	Current Bill for This Volume	Modeled Bill for This Volume	Bill Increase or Decrease ()	Percent Increase or Decrease (-)
PWSD, Towns, Hig Hab (18, 19, 20)	0	7	7	\$16.50	\$12.63	-\$3.87	-23%
	100	0	7	\$19.36	\$15.29	-\$4.07	-21%
	200	0	7	\$22.22	\$17.95	-\$4.27	-19%
	500	0	7	\$30.80	\$25.93	-\$4.87	-16%
	800	0	7	\$39.38	\$33.92	-\$5.46	-14%
	1,000	0	7	\$45.10	\$39.24	-\$5.86	-13%
	1,500	0	7	\$59.40	\$52.55	-\$6.85	-12%
	2,000	0	7	\$73.70	\$65.85	-\$7.85	-11%
	2,500	0	7	\$88.00	\$79.16	-\$8.84	-10%
	3,000	0	7	\$102.30	\$92.47	-\$9.83	-10%
	5,000	0	7	\$159.50	\$145.69	-\$13.81	-9%
	7,500	0	7	\$231.00	\$212.23	-\$18.77	-8%
	10,000	0	7	\$302.50	\$278.76	-\$23.74	-8%
	20,000	0	7	\$588.50	\$544.89	-\$43.61	-7%
	30,000	0	7	\$874.50	\$811.02	-\$63.48	-7%
	50,000	0	7	\$1,446.50	\$1,343.28	-\$103.22	-7%
	70,000	0	7	\$2,018.50	\$1,875.53	-\$142.97	-7%
	100,000	0	7	\$2,876.50	\$2,673.92	-\$202.58	-7%
	300,000	0	7	\$8,596.50	\$7,996.51	-\$599.99	-7%
	500,000	0	7	\$14,316.50	\$13,319.10	-\$997.40	-7%
	666,668	0	7	\$16,749.85	\$17,754.62	\$1,004.77	6%
	700,000	0	8	\$17,236.50	\$18,641.69	\$1,405.19	8%
	833,333	0	8	\$18,916.50	\$22,190.07	\$3,273.58	17%
	900,000	0	8	\$19,756.50	\$23,964.28	\$4,207.78	21%
	1,100,000	0	8	\$22,276.50	\$29,286.87	\$7,010.37	31%
	1,500,000	0	8	\$27,316.50	\$39,932.05	\$12,615.55	46%
	2,000,000	0	8	\$33,616.50	\$53,238.52	\$19,622.02	58%
Wholesale (5, 7, 8 10, 11)	0	2	2	\$2.75	\$12.63	\$9.88	359%
	100	0	2	\$5.61	\$15.29	\$9.68	173%
	200	0	2	\$8.47	\$17.95	\$9.48	112%
	500	0	2	\$17.05	\$25.93	\$8.88	52%
	800	0	2	\$25.63	\$33.92	\$8.29	32%
	1,000	0	2	\$31.35	\$39.24	\$7.89	25%
	1,500	0	2	\$45.65	\$52.55	\$6.90	15%
	2,000	0	2	\$59.95	\$65.85	\$5.90	10%
	2,500	0	2	\$74.25	\$79.16	\$4.91	7%
	3,000	0	2	\$88.55	\$92.47	\$3.92	4%
	5,000	0	2	\$145.75	\$145.69	-\$0.06	0%
	7,500	0	2	\$217.25	\$212.23	-\$5.02	-2%
	10,000	0	2	\$288.75	\$278.76	-\$9.99	-3%
	20,000	0	2	\$574.75	\$544.89	-\$29.86	-5%
	30,000	1	3	\$860.75	\$811.02	-\$49.73	-6%
	50,000	0	3	\$1,432.75	\$1,343.28	-\$89.47	-6%
	70,000	1	4	\$1,724.75	\$1,875.53	\$150.78	9%
	100,000	1	4	\$2,162.75	\$2,673.92	\$511.17	24%
	300,000	1	5	\$5,082.75	\$7,996.51	\$2,913.76	57%

Table 16 - User Statistics
City of Higginsville, Missouri; Water Rates Scenario 2018-2

This table shows measures of equitability, or "fairness," of the rates as modeled in Table 10. If system development fees or capacity surcharges were also calculated but not included in Table 10, this table does not take those fees into account.

If your rates are absolutely proportional to use on a volumetric basis, your % of usage and % of revenues figures will be the same within all the classes. That is not possible if you have any minimum charge and having no minimum charge is almost unheard of.

Normally, the % of usage figure will be lower than the % of revenue for the lower volumes of use. That will switch for the higher volumes of use. Even for declining rate structures, this switch should occur near the volume of the average residential user, typically near 5,000 gallons/month (668 cu ft).

In urban and suburban areas the average monthly use for residential or general customers can be twice that used by their rural and "old town" counterparts. Use is largely dependent upon who lives in a community. Older people living in longer established neighborhoods tend to use less volume than younger people living in more recently developed areas. As you make comparisons between different customers and customer classes, keep that, and the following in mind:

469 Cu Ft: This is the average residential customer's usage per Monthly billing cycle.

Usage allowance is the volume "given away" with the minimum charge. The higher the allowance, the less volume the utility can sell to generate income.

32,079,010 Cu Ft: This is the volume metered through customer meters that was available to be sold by the utility during the test year.

0 Cu Ft: This is the volume metered through customer meters that was given away as a usage allowance during the test year.

\$0 Loss: At the unit charge rate in effect during the test year, the utility failed to collect this much revenue due to the usage allowance.

\$0 Loss: At the modeled (recommended) unit charge rates and usage allowance (if any), over a full year this is the amount of revenue the utility would fail to collect due to the usage allowance as modeled (if any).

Customer or Rate Class, or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Avg. Use in Each Volume Range in 100 Cu Ft	Total Annual Use in Each Volume Range in Cu Ft	Customers Within This Volume Range	% Users	% Usage	Cumulative Use in This Class From Low to High Volume	Cumulative Use in This Class From High to Low Volume	% Revenue at Current Rates	% Revenue at Modeled Rates
In City Residential (16 & 9)	0	99	0.916	1,865,884.0	201.3	9.7%	5.8%	19.6%	100.0%	7.8%	7.4%
	100	199	0.931	1,670,327.0	197.8	9.5%	5.2%	37.1%	80.4%	7.0%	6.8%
	200	499	2.190	3,410,612.0	678.9	32.7%	10.6%	72.8%	62.9%	15.2%	17.0%
	500	799	1.853	1,376,684.0	399.3	19.2%	4.3%	87.2%	27.2%	6.5%	8.3%
	800	999	1.432	377,523.0	105.0	5.1%	1.2%	91.2%	12.8%	1.8%	2.2%
	1,000	1,499	2.798	385,277.0	78.3	3.8%	1.2%	95.2%	8.8%	1.7%	1.9%
	1,500	1,999	3.368	147,180.0	18.9	0.9%	0.5%	96.8%	4.8%	0.6%	0.6%
	2,000	2,499	3.611	75,837.0	8.1	0.4%	0.2%	97.6%	3.2%	0.3%	0.3%
	2,500	2,999	3.765	42,544.0	4.0	0.2%	0.1%	98.0%	2.4%	0.2%	0.2%
	3,000	4,999	11.475	74,590.0	3.8	0.2%	0.2%	98.8%	2.0%	0.2%	0.2%
	5,000	7,499	15.331	30,661.0	0.9	0.0%	0.1%	99.1%	1.2%	0.1%	0.1%
	7,500	9,999	20.744	18,670.0	0.2	0.0%	0.1%	99.3%	0.9%	0.1%	0.1%
	10,000	19,999	68.786	48,150.0	0.3	0.0%	0.2%	99.8%	0.7%	0.1%	0.1%
	20,000	29,999	52.633	15,790.0	0.2	0.0%	0.0%	100.0%	0.2%	0.0%	0.0%
	30,000	49,999	14.700	1,470.0	0.1	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Totals for Class				9,541,199.0	1,697.0	81.7%	29.7%			41.7%	45.3%

Table 16 - User Statistics

Customer or Rate Class, or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Avg. Use in Each Volume Range in 100 Cu Ft	Total Annual Use in Each Volume Range in Cu Ft	Customers Within This Volume Range	% Users	% Usage	Cumulative Use in This Class From Low to High Volume	Cumulative Use in This Class From High to Low Volume	% Revenue at Current Rates	% Revenue at Modeled Rates
In City Non Residential (1, 2, 3, 13, 14, 15, 21)	0	99	0.769	283,481.0	103.3	5.0%	0.9%	4.2%	100.0%	1.4%	2.0%
	100	199	0.881	215,308.0	41.3	2.0%	0.7%	7.4%	95.8%	1.0%	1.1%
	200	499	2.390	465,662.0	54.3	2.6%	1.5%	14.3%	92.6%	2.0%	1.9%
	500	799	2.596	336,491.0	25.7	1.2%	1.0%	19.4%	85.7%	1.4%	1.2%
	800	999	1.847	182,515.0	12.3	0.6%	0.6%	22.1%	80.6%	0.7%	0.6%
	1,000	1,499	4.267	358,882.0	17.6	0.8%	1.1%	27.4%	77.9%	1.4%	1.2%
	1,500	1,999	4.472	281,711.0	11.2	0.5%	0.9%	31.6%	72.6%	1.1%	0.9%
	2,000	2,499	4.495	222,966.0	8.3	0.4%	0.7%	34.9%	68.4%	0.9%	0.7%
	2,500	2,999	4.632	183,420.0	4.9	0.2%	0.6%	37.6%	65.1%	0.7%	0.6%
	3,000	4,999	15.846	534,006.0	9.8	0.5%	1.7%	45.6%	62.4%	1.5%	1.6%
	5,000	7,499	20.878	457,231.0	5.3	0.3%	1.4%	52.4%	54.4%	1.3%	1.3%
	7,500	9,999	21.758	337,256.0	3.7	0.2%	1.1%	57.4%	47.6%	1.0%	1.0%
	10,000	19,999	60.290	669,216.0	5.8	0.3%	2.1%	67.4%	42.6%	1.9%	1.9%
	20,000	29,999	75.680	310,289.0	1.2	0.1%	1.0%	72.0%	32.6%	0.9%	0.9%
	30,000	49,999	161.974	437,329.0	0.8	0.0%	1.4%	78.5%	28.0%	1.2%	1.2%
	50,000	69,999	182.300	309,910.0	0.3	0.0%	1.0%	83.1%	21.5%	0.9%	0.8%
	70,000	99,999	297.046	386,160.0	0.1	0.0%	1.2%	88.8%	16.9%	1.1%	1.0%
	100,000	299,999	626.067	751,280.0	1.0	0.0%	2.3%	100.0%	11.2%	2.1%	2.0%
	Totals for Class			6,723,113.0	307.0	14.8%	21.0%			22.3%	21.7%
City (6)	0	99	0.516	11,770.0	11.3	0.5%	0.0%	9.3%	100.0%	0.0%	0.0%
	100	199	0.857	7,968.0	1.9	0.1%	0.0%	15.7%	90.7%	0.0%	0.0%
	200	499	2.023	14,162.0	2.9	0.1%	0.0%	26.9%	84.3%	0.0%	0.0%
	500	799	2.483	8,692.0	1.2	0.1%	0.0%	33.8%	73.1%	0.0%	0.0%
	800	999	1.843	3,870.0	0.2	0.0%	0.0%	36.8%	66.2%	0.0%	0.0%
	1,000	1,499	4.479	8,510.0	0.3	0.0%	0.0%	43.6%	63.2%	0.0%	0.0%
	1,500	1,999	4.775	7,640.0	0.1	0.0%	0.0%	49.6%	56.4%	0.0%	0.0%
	2,000	2,499	5.000	7,500.0	0.0	0.0%	0.0%	55.6%	50.4%	0.0%	0.0%
	2,500	2,999	4.467	6,700.0	0.3	0.0%	0.0%	60.9%	44.4%	0.0%	0.0%
	3,000	4,999	19.242	23,090.0	0.3	0.0%	0.1%	79.2%	39.1%	0.0%	0.0%
	5,000	7,499	12.350	9,880.0	0.6	0.0%	0.0%	87.1%	20.8%	0.0%	0.0%
	7,500	9,999	25.000	2,500.0	0.0	0.0%	0.0%	89.0%	12.9%	0.0%	0.0%
	10,000	19,999	100.000	10,000.0	0.0	0.0%	0.0%	97.0%	11.0%	0.0%	0.0%
	20,000	29,999	38.300	3,830.0	0.1	0.0%	0.0%	100.0%	3.0%	0.0%	0.0%
	Totals for Class			126,112.0	19.0	0.9%	0.4%			0.1%	0.3%

Table 16 - User Statistics

Customer or Rate Class, or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Avg. Use in Each Volume Range in 100 Cu Ft	Total Annual Use in Each Volume Range in Cu Ft	Customers Within This Volume Range	% Users	% Usage	Cumulative Use in This Class From Low to High Volume	Cumulative Use in This Class From High to Low Volume	% Revenue at Current Rates	% Revenue at Modeled Rates
No Charge (12)	0	99	0.844	3,040.0	0.5	0.0%	0.0%	16.7%	100.0%	0.0%	0.0%
	100	199	0.990	2,970.0	0.1	0.0%	0.0%	33.1%	83.3%	0.0%	0.0%
	200	499	2.452	7,110.0	0.9	0.0%	0.0%	72.2%	66.9%	0.0%	0.0%
	500	799	2.383	4,290.0	0.9	0.0%	0.0%	95.9%	27.8%	0.0%	0.0%
	800	999	0.829	580.0	0.5	0.0%	0.0%	99.1%	4.1%	0.0%	0.0%
	1,000	1,499	1.700	170.0	0.1	0.0%	0.0%	100.0%	0.9%	0.0%	0.0%
	Totals for Class			18,160.0	3.0	0.1%	0.1%			0.0%	0.0%
Rural (4, 17)	0	99	0.867	39,540.0	6.0	0.3%	0.1%	12.7%	100.0%	0.2%	0.2%
	100	199	0.949	36,440.0	2.9	0.1%	0.1%	24.3%	87.3%	0.2%	0.2%
	200	499	2.254	78,666.0	13.1	0.6%	0.2%	49.5%	75.7%	0.5%	0.5%
	500	799	2.114	40,582.0	8.3	0.4%	0.1%	62.5%	50.5%	0.3%	0.3%
	800	999	1.677	15,432.0	2.3	0.1%	0.0%	67.4%	37.5%	0.1%	0.1%
	1,000	1,499	3.677	23,902.0	2.2	0.1%	0.1%	75.1%	32.6%	0.1%	0.1%
	1,500	1,999	4.446	17,340.0	0.8	0.0%	0.1%	80.6%	24.9%	0.1%	0.1%
	2,000	2,499	4.010	12,031.0	0.9	0.0%	0.0%	84.5%	19.4%	0.1%	0.1%
	2,500	2,999	4.283	8,137.0	0.5	0.0%	0.0%	87.1%	15.5%	0.0%	0.0%
	3,000	4,999	11.474	14,916.0	0.8	0.0%	0.0%	91.9%	12.9%	0.1%	0.1%
	5,000	7,499	21.575	8,630.0	0.1	0.0%	0.0%	94.6%	8.1%	0.0%	0.0%
	7,500	9,999	25.000	7,500.0	0.0	0.0%	0.0%	97.0%	5.4%	0.0%	0.0%
	10,000	19,999	30.867	9,260.0	0.3	0.0%	0.0%	100.0%	3.0%	0.0%	0.0%
	Totals for Class			312,376.0	38.0	1.8%	1.0%			1.9%	1.7%

Table 16 - User Statistics

Customer or Rate Class, or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Avg. Use in Each Volume Range in 100 Cu Ft	Total Annual Use in Each Volume Range in Cu Ft	Customers Within This Volume Range	% Users	% Usage	Cumulative Use in This Class From Low to High Volume	Cumulative Use in This Class From High to Low Volume	% Revenue at Current Rates	% Revenue at Modeled Rates
PWSD, Towns, Hig Hab (18, 19, 20)	0	99	0.125	1,200.0	7.0	0.3%	0.0%	0.0%	100.0%	0.1%	0.1%
	100	199	1.000	1,200.0	0.0	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
	200	499	3.000	3,600.0	0.0	0.0%	0.0%	0.1%	100.0%	0.0%	0.0%
	500	799	3.000	3,600.0	0.0	0.0%	0.0%	0.1%	99.9%	0.0%	0.0%
	800	999	2.000	2,400.0	0.0	0.0%	0.0%	0.1%	99.9%	0.0%	0.0%
	1,000	1,499	5.000	6,000.0	0.0	0.0%	0.0%	0.2%	99.9%	0.0%	0.0%
	1,500	1,999	5.000	6,000.0	0.0	0.0%	0.0%	0.2%	99.8%	0.0%	0.0%
	2,000	2,499	5.000	6,000.0	0.0	0.0%	0.0%	0.3%	99.8%	0.0%	0.0%
	2,500	2,999	5.000	6,000.0	0.0	0.0%	0.0%	0.4%	99.7%	0.0%	0.0%
	3,000	4,999	20.000	24,000.0	0.0	0.0%	0.1%	0.6%	99.6%	0.1%	0.0%
	5,000	7,499	25.000	30,000.0	0.0	0.0%	0.1%	0.9%	99.4%	0.1%	0.1%
	7,500	9,999	25.000	30,000.0	0.0	0.0%	0.1%	1.2%	99.1%	0.1%	0.1%
	10,000	19,999	100.000	120,000.0	0.0	0.0%	0.4%	2.4%	98.8%	0.3%	0.2%
	20,000	29,999	100.000	120,000.0	0.0	0.0%	0.4%	3.6%	97.6%	0.3%	0.2%
	30,000	49,999	200.000	240,000.0	0.0	0.0%	0.7%	6.1%	96.4%	0.6%	0.5%
	50,000	69,999	200.000	240,000.0	0.0	0.0%	0.7%	8.5%	93.9%	0.6%	0.5%
	70,000	99,999	300.000	360,000.0	0.0	0.0%	1.1%	12.1%	91.5%	0.9%	0.7%
	100,000	299,999	2,000.000	2,400,000.0	0.0	0.0%	7.5%	36.4%	87.9%	6.3%	4.8%
	300,000	499,999	2,000.000	2,400,000.0	0.0	0.0%	7.5%	60.7%	63.6%	6.3%	4.8%
	500,000	666,667	1,666.678	2,000,013.7	0.0	0.0%	6.2%	80.9%	39.3%	5.3%	4.0%
	666,668	699,999	305.026	366,031.3	0.2	0.0%	1.1%	84.6%	19.1%	0.5%	0.7%
	700,000	833,332	1,051.113	1,051,113.0	0.3	0.0%	3.3%	95.2%	15.4%	1.4%	2.1%
	833,333	899,999	475.553	285,332.0	0.3	0.0%	0.9%	98.1%	4.8%	0.3%	0.6%
	900,000	1,099,999	924.100	184,820.0	0.2	0.0%	0.6%	100.0%	1.9%	0.2%	0.4%
Totals for Class				9,887,310.0	8.0	0.4%	30.8%			23.7%	20.0%

Table 16 - User Statistics

Customer or Rate Class, or Meter Size	Volume Range Bottom (in Cu Ft)	Volume Range Top (in Cu Ft)	Avg. Use in Each Volume Range in 100 Cu Ft	Total Annual Use in Each Volume Range in Cu Ft	Customers Within This Volume Range	% Users	% Usage	Cumulative Use in This Class From Low to High Volume	Cumulative Use in This Class From High to Low Volume	% Revenue at Current Rates	% Revenue at Modeled Rates
Wholesale (5, 7, 8 10, 11)	0	99	0.600	3,600.0	2.0	0.1%	0.0%	0.1%	100.0%	0.0%	0.0%
	100	199	1.000	3,600.0	0.0	0.0%	0.0%	0.1%	99.9%	0.0%	0.0%
	200	499	3.000	10,800.0	0.0	0.0%	0.0%	0.3%	99.9%	0.0%	0.0%
	500	799	3.000	10,800.0	0.0	0.0%	0.0%	0.5%	99.7%	0.0%	0.0%
	800	999	2.000	7,200.0	0.0	0.0%	0.0%	0.7%	99.5%	0.0%	0.0%
	1,000	1,499	5.000	18,000.0	0.0	0.0%	0.1%	1.0%	99.3%	0.0%	0.0%
	1,500	1,999	5.000	18,000.0	0.0	0.0%	0.1%	1.3%	99.0%	0.0%	0.0%
	2,000	2,499	5.000	18,000.0	0.0	0.0%	0.1%	1.6%	98.7%	0.0%	0.0%
	2,500	2,999	5.000	18,000.0	0.0	0.0%	0.1%	2.0%	98.4%	0.0%	0.0%
	3,000	4,999	20.000	72,000.0	0.0	0.0%	0.2%	3.3%	98.0%	0.2%	0.1%
	5,000	7,499	25.000	90,000.0	0.0	0.0%	0.3%	4.9%	96.7%	0.2%	0.2%
	7,500	9,999	25.000	90,000.0	0.0	0.0%	0.3%	6.6%	95.1%	0.2%	0.2%
	10,000	19,999	100.000	360,000.0	0.0	0.0%	1.1%	13.2%	93.4%	0.9%	0.7%
	20,000	29,999	100.000	360,000.0	0.0	0.0%	1.1%	19.7%	86.8%	0.9%	0.7%
	30,000	49,999	186.586	671,708.0	0.7	0.0%	2.1%	32.0%	80.3%	1.8%	1.4%
	50,000	69,999	178.058	498,562.0	0.3	0.0%	1.6%	41.1%	68.0%	1.3%	1.0%
	70,000	99,999	240.933	578,240.0	0.8	0.0%	1.8%	51.7%	58.9%	0.8%	1.2%
	100,000	299,999	1,555.787	2,333,680.0	0.6	0.0%	7.3%	94.4%	48.3%	3.1%	4.7%
	300,000	499,999	385.688	308,550.0	0.7	0.0%	1.0%	100.0%	5.6%	0.4%	0.6%
	Totals for Class				5,470,740.0	5.0	0.2%	17.1%		10.3%	11.1%
Grand Totals				32,079,010.0		100.00%	100.00%		100.00%	100.00%	

Chart 1 - Operating Ratio

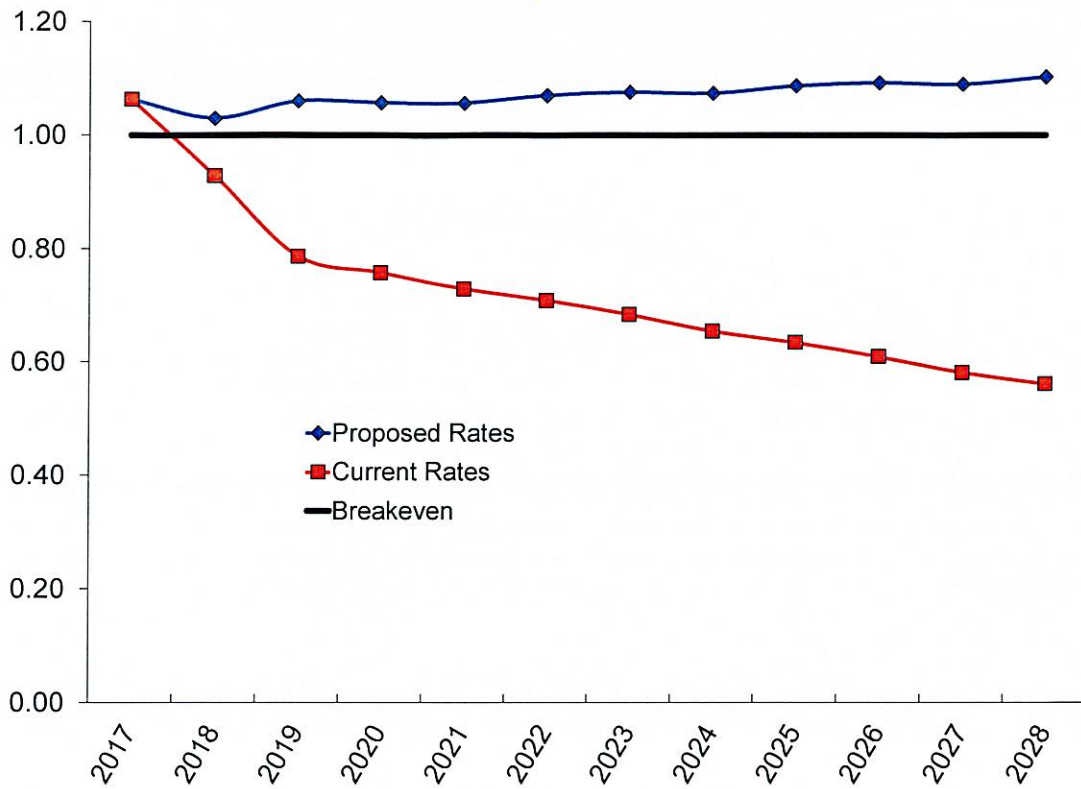


Chart 2 - Coverage Ratio

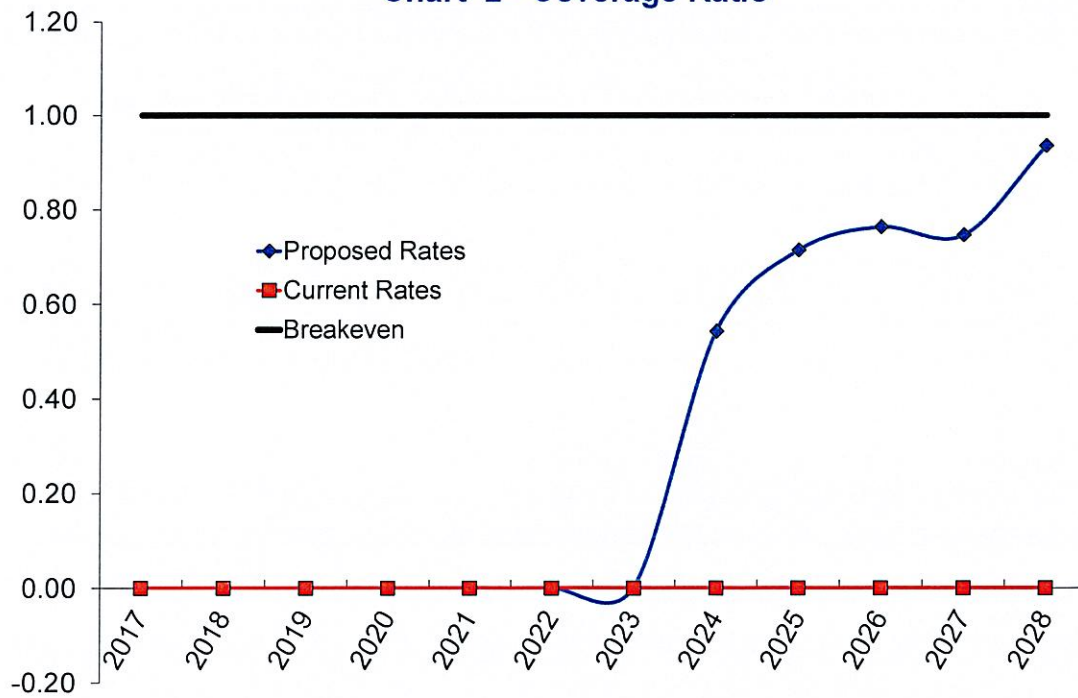


Chart 3 - 5,000 Gal Residential User's Bill

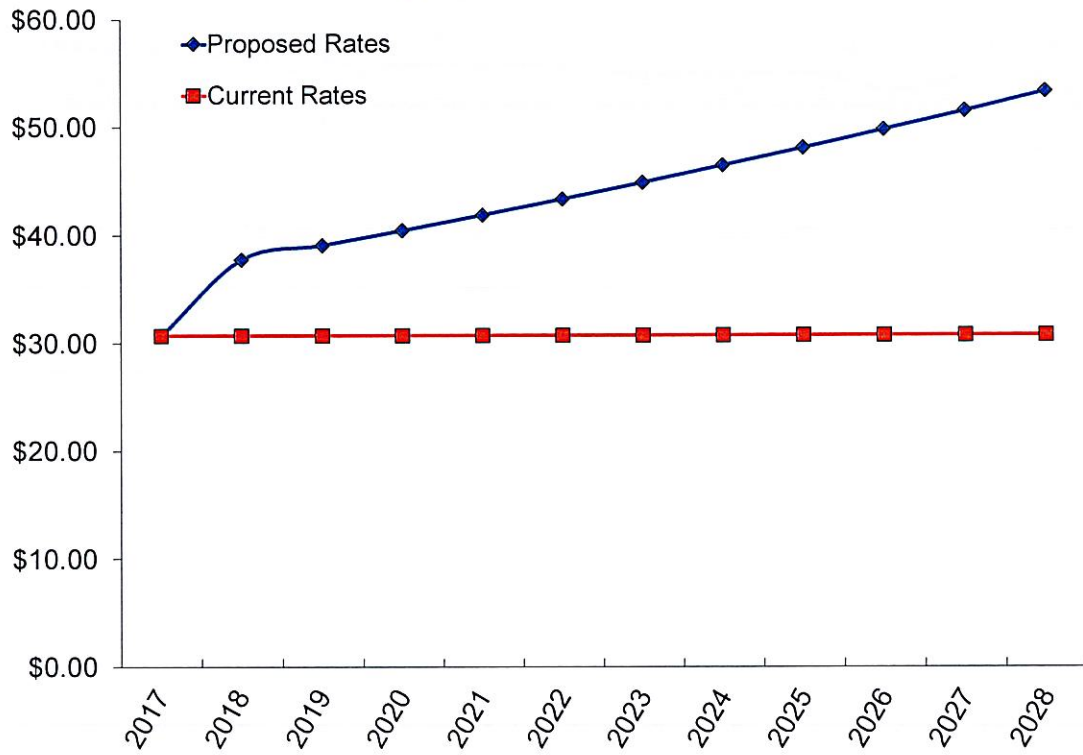


Chart 4 - Affordability Index

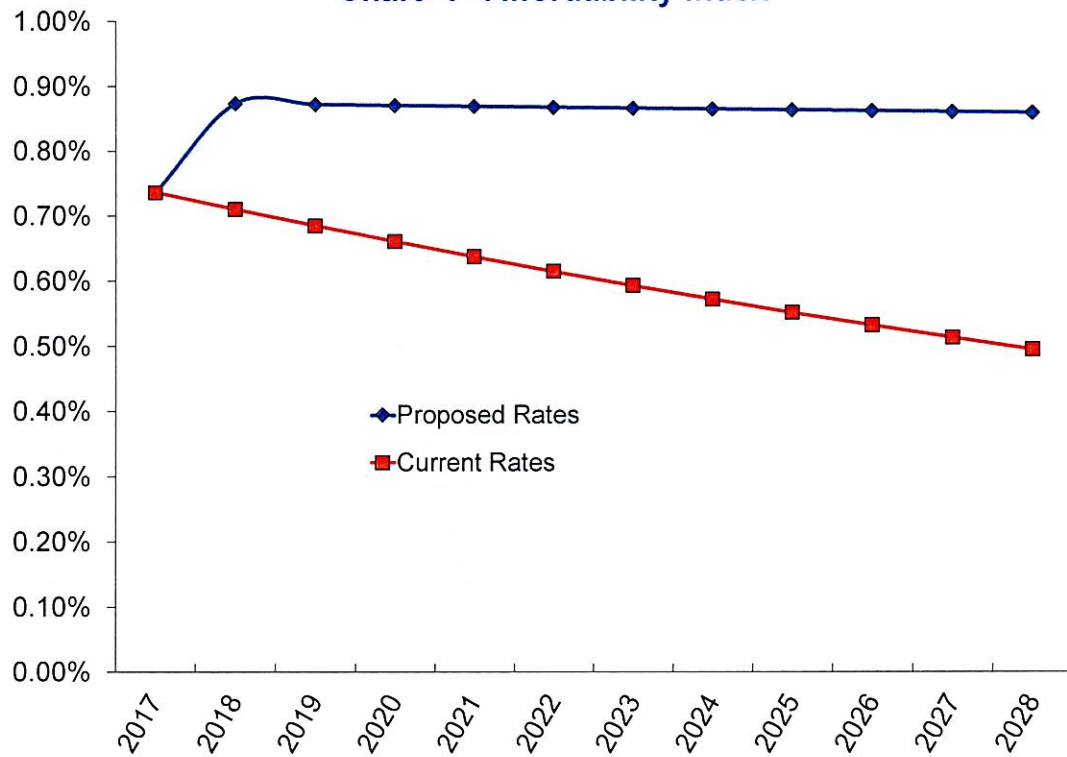


Chart 5 - Working Capital vs Goal

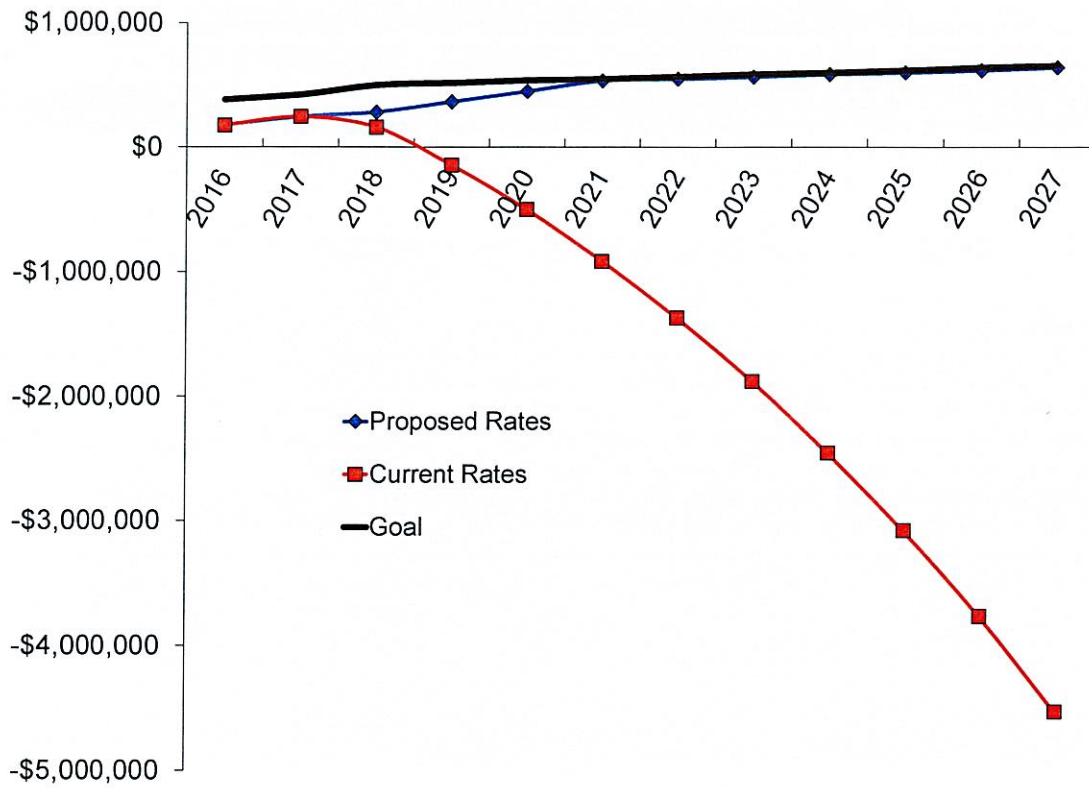


Chart 6 - Value of Cash Assets Before Inflation

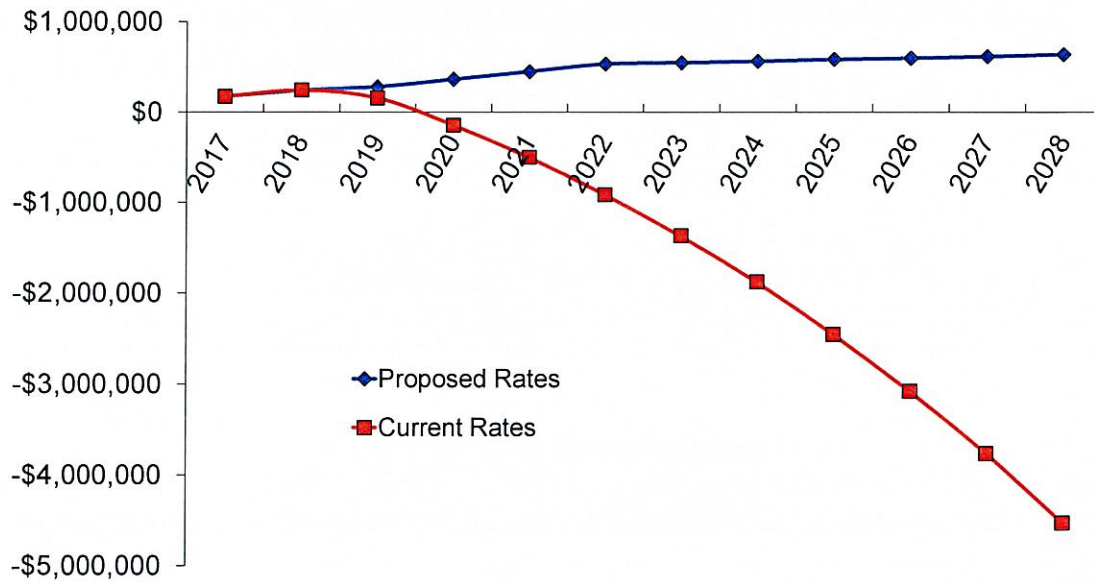


Chart 7 - Value of Cash Assets After Inflation

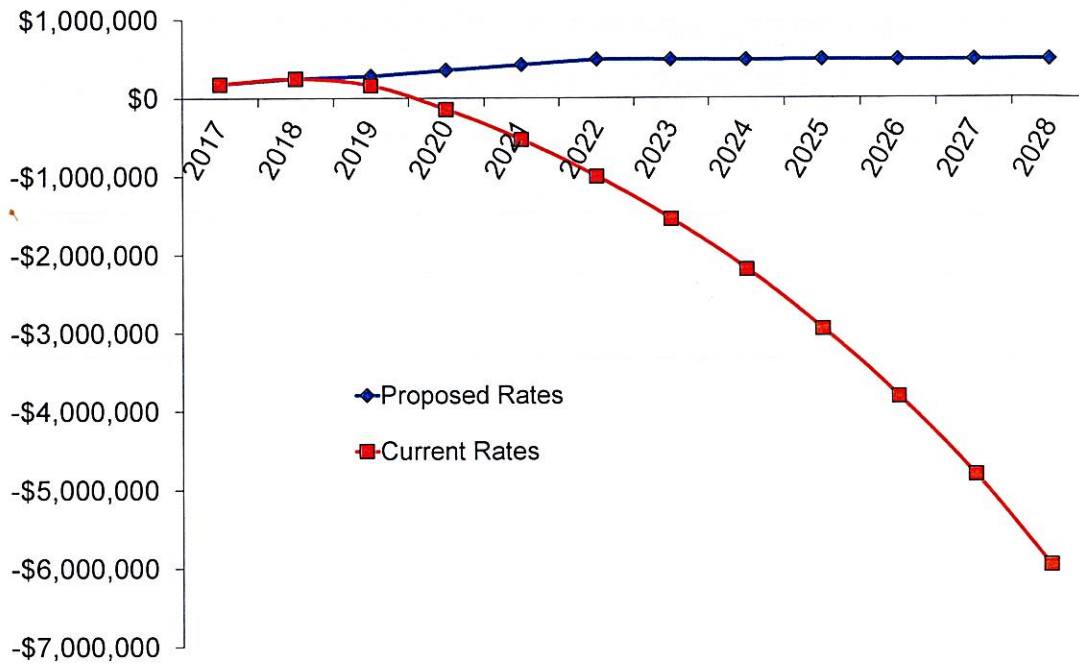


Chart 8 - Sum of All Reserves

