



**BERLIN MAYOR AND COUNCIL**  
**Meeting Agenda**  
**Mayor and Council Work Session**

**Berlin Town Hall**  
**10 William Street**  
**Monday, November 1, 2021**

**6:00 PM            WORK SESSION – Council Chambers**

1. Jean Holloway, SERCAP, INC.: Water and Wastewater Rate Analysis Report
2. Comments from the Council
3. Comments from the Mayor

**\*\*Public Attendance at Meetings**

Per Mayor Zack Tyndall: EFFECTIVE JUNE 7, 2021, Mayor and Council Meetings will be held in-person with masks required and will continue to be streamed live to Facebook for viewing purposes only.

To access the Meeting via live stream on Facebook, please click on the blue Facebook icon at the top of any page on the Town website, [www.berlinmd.gov](http://www.berlinmd.gov), or type @berlinmd in the Facebook search bar. No response will be given to questions and comments submitted via Facebook during any meeting including Public Hearings.

Anyone having questions about the meetings mentioned above or needing special accommodations should contact Town Administrator Jeffrey Fleetwood at (410) 641-4002. Written materials in alternate formats for persons with disabilities are made available upon request. TTY users dial 7-1-1 in the State of Maryland/outside Maryland dial 1-800-735-2258.



Water and Wastewater Rate Analysis Report  
For  
The Town of Berlin, Maryland



Prepared by: Jean S. Holloway  
SERCAP Maryland-Delaware

Presented: September 30, 2021



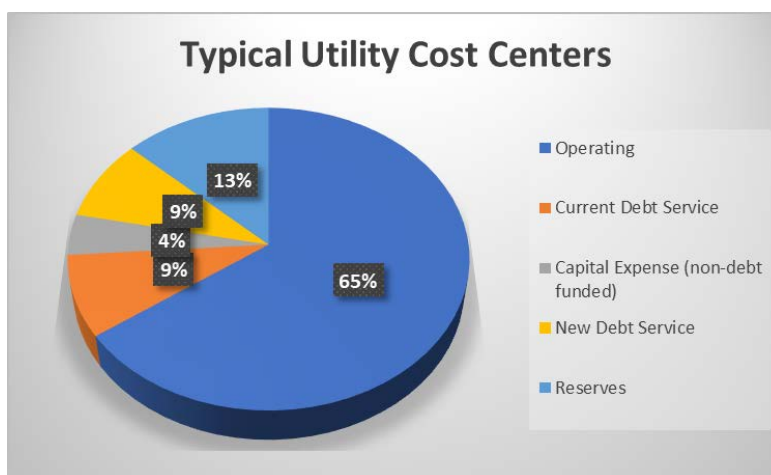
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## *Water Analysis and Recommendations*

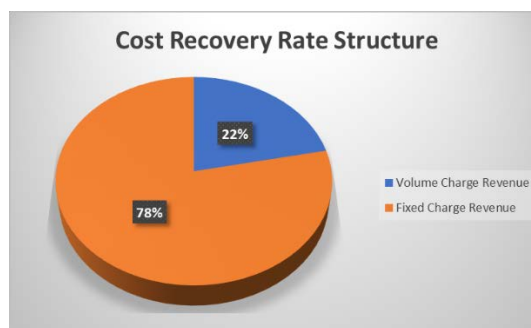
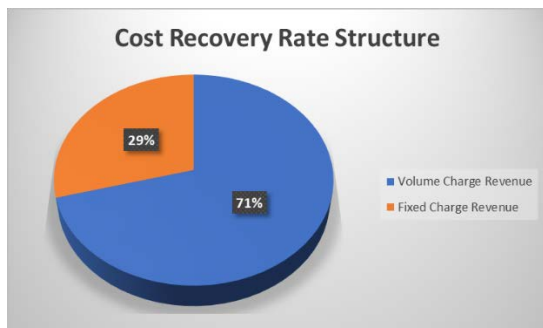
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## Rate Setting and Cost Recovery Principles:

The goal of any sustainable utility is to fully recover its costs of operation, including capital expenditures, both self- and debt-funded, reasonable reserves and general overhead. The way in which these various costs may be recovered is embedded in the rate structure. The level of charges for fixed and variable costs is generally known as “the rates”. If the full costs of owning and operating the utility are viewed as a pie, the rate structure and subsequent charges reflect how that pie is sliced. What doesn’t change in any of these scenarios is the size of the pie itself. What is not in one piece will be in the other, but the pie remains the same. This is illustrated in the figure below.



These costs of operations, “the pie,” can be recovered through fixed charges or volume charges that reflect what each customer uses. Usually it is with a combination of both, with fixed charges covering the utility’s fixed costs, and volumetric charges covering the variable costs that change according to the amount of water (or sewer) used, but again, what isn’t in one piece must be in the other as the two figures below illustrate.



Either structure will recover the utility’s costs, but the structure used will determine *where* the money comes from, how and when it is received.

### **Three Things to Do BEFORE a Rate Change:**

1. If there is a gallon allowance included in a minimum bill, consider reducing or eliminating those gallons, making them subject to the volume charge. If that is politically or practically not feasible, then make sure the charge that includes those gallons is not less than the base cost to produce those gallons. No gallon allowance is preferred, however, if there must be a quantity of water included in a minimum charge it should be as low as possible and not more than 3,000 gallons per month or 9,000 gallons per quarter. If your gallon allowance is too high you may be giving away water in that minimum bill as well as encouraging people to waste water rather than conserve it.
2. Get a handle on non-revenue water. That is water your system produces and which costs to produce, but for which there is no revenue coming back to cover costs. There will always be a certain amount of water that doesn't get billed or paid for, after all, unlike sewer pipes, water pipes hold water all the time. There may also be connections you don't charge for water service, such as your own town buildings or the fire department. Those buildings should still be metered even if you choose not to charge them as a matter of policy. If they are not, consider installing meters and reading them without billing. Otherwise, there is no way to tell how much water is lost or un-billable. A simple calculation or two can give you an idea of how much is non-revenue water. Subtracting billed gallons from gallons produced during the same period, whether month or quarter, will give you a non-revenue figure. That can then be reduced further by deducting known losses, leaks, fire flows, filter backwash, hydrant flushing, etc. When everything has been accounted for, the difference between production and known water consumption should be less than 15%. If it is higher than 15% an evaluation of meters and leak detection may be in order, or at least a more in-depth water audit to drill down on the amount of water not being billed.
3. Get a grip on collections. You should be collecting at least 95% of what you're billing before the next bill is sent out. You can measure that as 95% of the \$\$ billed or 95% of the total number of bills sent, but if you have more than 5% in arrears when the next bill is due, your paying customers are paying more than their share of the operating costs for the system.

These three things are stated in relation to a water utility but, with the possible exception of #2 above, the principles are the same for water or sewer. The difference with a sewer system would be if you see your system is treating more than its average daily flow or substantially more than the water that is produced whenever it rains, there may be an inflow and infiltration problem. That can mean you're treating water that isn't really sewage but runoff.

### **A Word About General Overhead/General Government:**

If you are a municipal system and have other services that are offered from your main office or town hall, it's important to measure the proportion of those general services that are directly related to the water and/or sewer utilities. The cost of a clerk who provides customer service daily, the cost of a town clerk/treasurer, the cost of a town manager/administrator, care and maintenance of the building, insurance, telephone, electricity, etc. are all services that may be

applied to all the town's services, and the costs of these should be allocated in some way to the utility if it is to recover its full cost of operation. Even if the governing body chooses deliberately to forego these costs and let them be paid by the General Fund, there should be some calculation to indicate how much those costs actually are.

### **A Word about Reserves:**

Many systems, small systems in particular, tend to think of reserves as something that is either a "paper number" and a nice thing to have or that should be accumulated outside of the rate structure for a rainy day. Reserves are, in fact, an actual cost of operation and, as such, should be included in whole or in part in the calculation of a *full* cost recovery rate structure. Including reserves as a cost of operation reflects two basic philosophies: 1) current users should pay for the cost to serve them rather than putting the cost burden on future users; and 2) current users should bear some of the costs of the system's eventual replacement as they are the ones causing it to wear out currently by receiving service. That is not to say that every user currently connected should pay a portion of the cost to install the system when it was brand new, but that current users should pay a fair share of the debt service on that installation cost and any upgrades since as long as they remain customers.

In addition to bearing some share of the costs of system installation and repairs in a reserve, users should also pay for accumulating some level of reserve for emergencies. What that level is can be a matter of policy or a matter of simple arithmetic, but some reserve for contingencies is strongly recommended. Also, most lenders require some level of reserve to cover debt service in the event that there's an un-expected drop in revenue or loss of large portions of the customer base. The amount of that reserve depends on the lender and whatever is specified in the loan instruments and conditions but a minimum of 10% per year or one year's debt service payment is required.

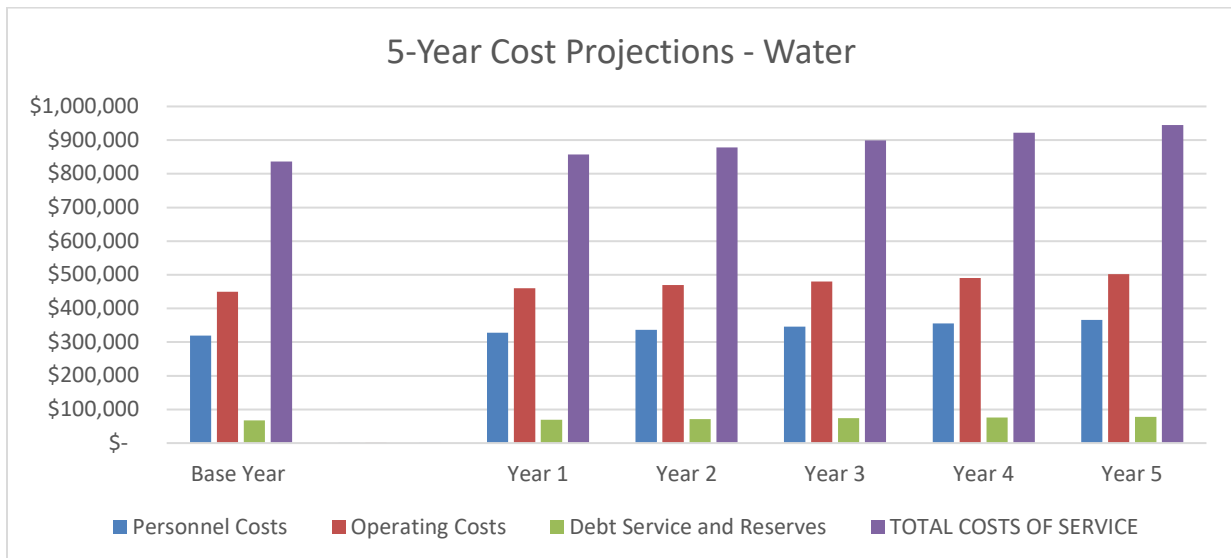
### **In Summary:**

These principles have been used in the course of analyzing your system's rate structure and offering options and recommendations for your consideration. The usual rules of thumb used by our analysis may have been altered or adjusted based on direction from your management team before this final report was presented. Changes from standard procedure, if any, will be duly noted in the applicable section's narrative.

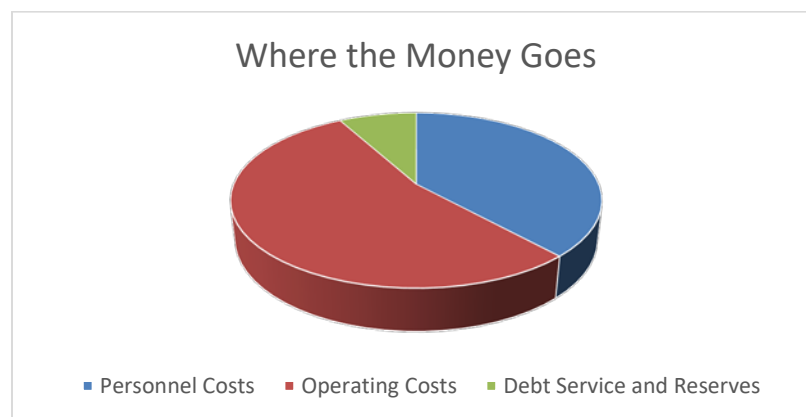
### System Costs and 5-year Cost Projection:

Berlin's expenses for the water system were examined using FY 20 as the test year and expenses were projected for five years forward using a general inflation rate of 2% for most items with a slightly higher rate for specific items like insurance (10%) and reserves (3%). A summary of the results is shown below.

Cost Group	FY 2020	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	\$ 319,310	\$ 327,737	\$ 336,538	\$ 345,739	\$ 355,371	\$ 365,467
Operating	\$ 449,939	\$ 459,673	\$ 469,675	\$ 479,959	\$ 490,537	\$ 501,424
Debt & Reserves	\$ 78,739	\$ 81,101	\$ 83,535	\$ 86,041	\$ 88,622	\$ 91,280
<b>TOTAL</b>	<b>\$ 847,988</b>	<b>\$ 868,512</b>	<b>\$ 889,748</b>	<b>\$ 911,738</b>	<b>\$ 934,530</b>	<b>\$ 958,172</b>



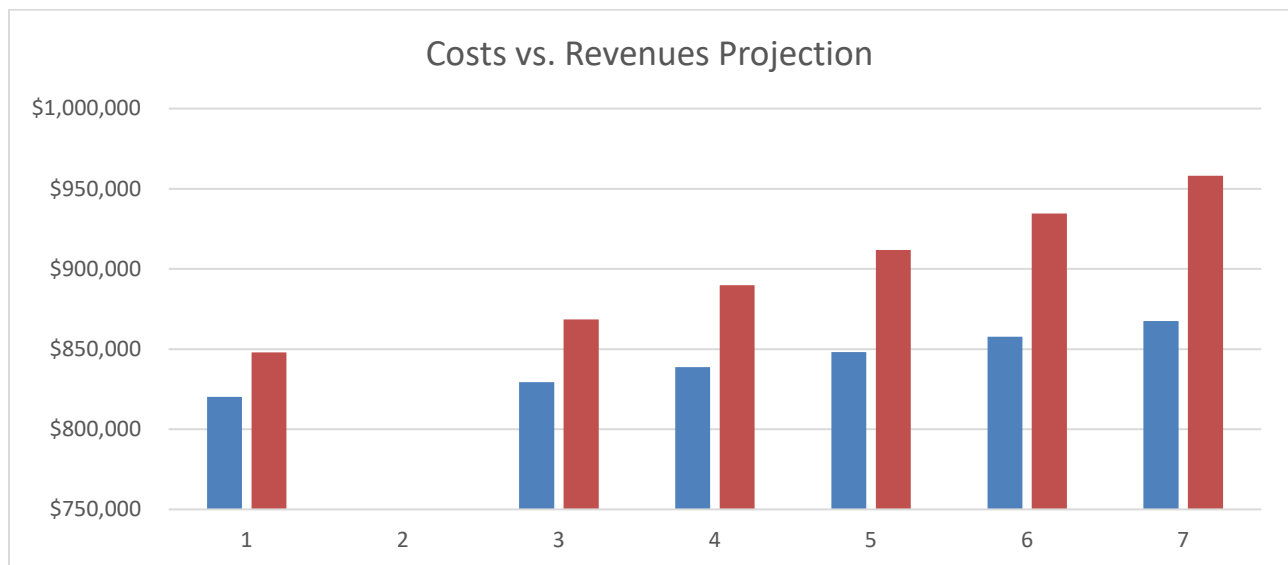
An illustration of the costs and where the money goes using the Pie analogy is shown below.



Clearly, the bulk of revenues, about 54%, goes directly to fund operations and only 8% is devoted to funding reserves. The water system currently has no debt service, which is both somewhat atypical, but may also be a benefit in providing for future loans to upgrade the system. HOWEVER, there will undoubtedly be debt at some point in the future as the majority of the distribution system is reaching the end of its useful life and problems are likely to increase exponentially over the next few years. In addition, the lion's share of the meters, which are the system's cash registers, are older than 10 years and will need replacing in the very near future.

**System Revenue and Revenue Requirement Projection:**

Revenue	FY 20	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue Available	\$ 820,240	\$ 829,451	\$ 838,773	\$ 848,210	\$ 857,762	\$ 867,430
Costs	\$ 847,988	\$ 868,512	\$ 889,748	\$ 911,738	\$ 934,530	\$ 958,172
Surplus/ (Deficit)	\$ (27,747)	\$ (39,061)	\$ (50,974)	\$ (63,528)	\$ (76,768)	\$ (90,742)



It should be noted that for the purpose of this analysis, Costs projected for Year 1 were used to calculate potential rates rather than the test year, since the 2020 year had already elapsed and rates needed to be tied to future expenses to avoid getting further behind.



### **Observations and Comments on Costs/Revenues Analysis:**

It is obvious that despite a lack of debt service, the water utility is not recovering all of its costs through rates and rate revenue. It is equally obvious that the system ***is not self-sustainable under the present circumstances***. While total revenue is sufficient to recover operations costs, a large chunk of that revenue (\$65,325 or 7%) is restricted for system upgrade and expansion since the source is connection fees. With that amount unavailable to fund operations, the system is not recovering all it should through rates and using the connection fee revenue to subsidize the rate revenue is not a good practice, and has even been found to be illegal in some states by case law. It is also clear that the deficit between costs and rate revenue will only increase over time, even without any future debt, so rates clearly need to be adjusted. It is further recommended that the rate structure be altered and interim measures for the current year are recommended below.

At present cost levels, the per Equivalent Dwelling Unit (EDU) customer charge only needs to be about \$3.15 per EDU, but that results in a per 1,000-gallon rate of \$6.67 to fully recover costs. Such a rate structure is not particularly equitable or desirable. The scenarios presented in this report start with a higher fixed customer charge to show the effects of each fixed charge on the usage rate. These numbers are for the basis of comparison and can be altered to reflect policy and desired outcomes, so long as decision makers understand that the “pie” as shown on page 1 will always be the same size, and what doesn’t come from one revenue slice must come from another.

### **Water Production and Non-Revenue Water:**

Water production and billing was examined for Calendar 2020, while costs and revenues are audited FY 2020 figures because of the way water production is reported to the state. Despite this overlap of periods, the water production and billing figures are from 12 months that reflect seasonal fluctuations and should be typical for the system.

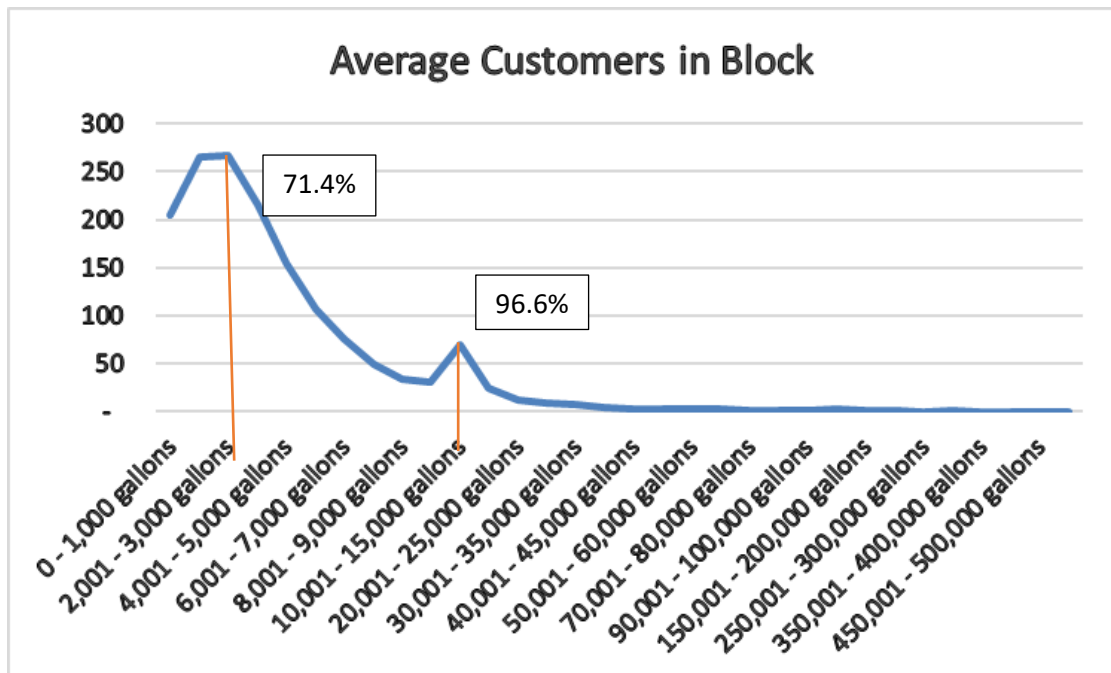
The results of this analysis show an average *non-revenue* water of more than 42,600,000 gallons for the calendar year or almost 25% of the gallons produced. This is water that costs to produce, but does not bring in any revenue. To put this in perspective, at an average rate of \$4.80 per 1,000 gallons, that volume represents \$204,480 in potential lost revenue. This is akin to a private manufacturer losing a full quarter of his product before recouping the first dollar in costs.

The actual revenue lost is more difficult to quantify given the present graduated flat rate and gallon allowance of the current rate structure. In addition to that some non-revenue water is to be expected, given that water lines remain full, filters must be backwashed, etc. If the *actual* gallons lost ***is even half*** of that amount, the lost revenue is well over \$100,000 and could make up the deficit projected each year for the entire five-year period shown. This non-revenue water must be reduced and accounted for if the system is to begin operating sustainably.

If there is only one recommendation from this report accepted, it is most strongly recommended that the town get a handle on this non-revenue water and reduce what is not accounted for to less than 15%. A water audit can help to identify the sources of this non-revenue water and determine what the actual gallon loss is vs. the apparent, or “paper” loss along with the system’s own use. It is also strongly recommended, that the town replace any water meters older than 10 years, since older meters will tend to exacerbate an already serious revenue loss by under-registering actual use.

#### **User Blocks and Average Users per Billing Period:**

A usual part of the rate analysis is to look at the user blocks to get an idea of where the majority of users fall. In Berlin’s case 71.4% of customers use 5,000 gallons per month or less. This can be an important factor in determining a minimum or customer charge in setting rates and rate structure. In addition, it was found that over 96% of customers use 20,000 gallons or below, another significant figure in identifying the impact of rate changes on specific customers or groups of customers. Berlin’s usage curve is represented below.



Generally speaking, this curve indicates that a change in minimum bill or gallons included in minimum bill will have the most impact on the lower end users – the 71.4% who use 5,000 gallons or less. The impacts on various levels of usage are more fully described in the study’s work papers.

### **Determining EDU's:**

SERCAP uses equivalent meter size to determine the total number of EDU's. This means that any residential 5/8-inch meter is classified as 1 EDU and all larger meters are a factor of that 5/8-inch meter. The multipliers used are those recommended by AWWA and are as follows:

Size	Equivalent
5/8"	1
3/4"	1.1
1"	1.4
1.5"	1.8
2"	2.9
3"	4.8
4"	6.4
6"	9.6

These multipliers were applied to Berlin's meter size inventory and resulted in an additional 600 EDU's added to the customer base for the purpose of calculating rates. The reason SERCAP uses Equivalent Meter Size for determining EDU's rather than volume of usage, is that the meter size doesn't change while the volume usage can fluctuate widely. Likewise, the total volume used can fluctuate widely from one year to another and systems don't typically adjust the number of EDU's charged each year according to the previous year's volume. Equivalent Meter Size is not a good way to determine EDU's of capacity, but for the purpose of determining EDU's for rate setting, it is the more constant predictor, and is used in this rate study.

### **Rate Scenarios and Alternatives:**

Rate scenarios and alternatives were calculated for consideration and two options are shown below. However, as these scenarios represent a change in rate *structure* even more than rate level, **there are interim measures recommended for the FY 22 billing year.** **These scenarios represent only a starting point for new rate structure** and rate levels and they should be re-visited with actual costs from 2021 as the base before any new rate structure is implemented. SERCAP will be happy to assist with that calculation when the time comes.

#### **Option #1**

Customer Charge: \$10.00 per EDU

Rate per 1,000 gal.: \$5.25

Average user of 5,000 gal/month would pay - \$36.25 monthly and \$435.00 annually

The Town would have a "cushion" (based on FY 21 projection) of \$9,895

## **Option #2**

Customer Charge: \$20.00 per EDU

Rate per 1,000 gal.: \$3.10

Average user of 5,000 gal/month would pay - \$35.50 monthly and \$426.00 annually

The Town would have a “cushion” (based on FY 21 projection) of \$13,450

These options would eliminate the graduated minimum charge with gallons included and charge an across-the-board charge per EDU to cover the cost to serve each customer or Equivalent Dwelling Unit. This structure is a more equitable way to recover the costs of serving each connection based on relative meter size, and means that every customer is paying only for what they, themselves, are using, and that they are not paying for water they don’t actually use. Again, these are **ONLY STARTING POINTS** for illustration and any rates should be re-calculated using actual 2021 costs before implementing a changed structure in 2022.

### **Observations and Comments:**

1. The present use of a graduated charge with a gallon allowance included, is not the most efficient way to recover fixed costs. Since there is already an issue with “non-revenue” or un-accounted for water, it exacerbates that as well. A better, more equitable method, and the one presented here, is to assess a minimum or customer charge to each Equivalent Dwelling Unit (based on relative meter size as discussed) and charge the per 1,000 usage from the first gallon. This charge represents each customer’s pro-rated share of the cost to install and bring the system to the customer’s tap, in a sense, a cost of membership in the system. This fixed customer charge per EDU provides a more consistent and predictable revenue stream NOT based on usage to cover the fixed costs, and a variable charge that is completely based on each customer’s actual usage. If the town wishes to establish tiered rates tied to usage, it should be done in the variable usage charge and *not* through the minimum or base customer charge.
2. With no current debt service charged to the water utility, the fixed customer charge can be fairly low while variable costs are recovering the majority of the revenue. However, if new debt is anticipated, which seems not only likely but recommended, the fixed customer charge should be increased to reflect the new fixed costs. Until the actual amount of debt service can be determined, that can be accomplished by making the customer charge a flat fee higher than it currently needs to be (\$3.15) with no debt.
3. As previously stated, the non-revenue water volume is a significant loss of revenue and every effort should be examined to resolve this to a level less than 15% of production. Ignoring this in the course of any rate consideration will only increase lost volume over time, resulting in increased costs and more lost revenue.

## **Conclusions and Recommendations:**

1. Older meters will almost always UNDER-register, resulting in water provided that is not paid for, i.e. NON-revenue water. A meter replacement effort can pay for itself over a few years, particularly with the level of loss seen here. The town's first priority should be replacing all meters with models capable of recording every gallon. The need for this cannot be over-emphasized, since these meters are the cash registers for the system and the ability to recover costs of operations is severely hampered by outdated or less than adequate meters. The effect of non-revenue water multiplies the loss when sewer billing is based on water usage.
2. A second priority should be conducting a water audit to identify the real source of the non-revenue water. There is a likelihood that at least a portion of that amount is from "paper" or apparent losses that arise in the course of clerical, administrative and meter reading processes. Whatever the source or combination of sources, the non-revenue water should be remedied as a first priority and any capital needs planned accordingly. A water audit can help to direct the remedies. Regardless of source, a meter replacement program is highly encouraged. Determining the actual volume of lost water for the water utility will tighten up cost recovery measures and make revenues more predictable. It will also have a multiplier effect on the wastewater utility as that billing is generally based on volume of water used.
3. An across-the-board customer charge per EDU is recommended to replace the current graduated minimum bill based on levels of usage. As discussed above, tying the minimum bill to usage results in a less predictable revenue stream to cover fixed costs and also leads to a higher cost per 1,000 gallons to offset costs of operation. A uniform customer charge per EDU is easier to administer and results in a much more consistent revenue stream to cover the fixed costs for the utility. It is understood that a complete re-structuring of rates will be difficult to do in mid-year, however, interim measures to help recover costs of operation for the current year are outlined below. Following those interim measures, it is most strongly recommended that the town re-structure its rates in anticipation of new metering capability.
4. Changing out water meters alone will not make the system sustainable. That is the first step in what should be a concerted effort to re-structure rates for more equitability and adequate cost recovery, as well as to achieve long-term sustainability and credit-worthiness. This will likely be a multi-year, phased in effort.
5. Raising the customer charge beyond the present level needed to cover fixed costs (\$3.15) can help to prepare for and eventually cover any debt service incurred to accomplish future capital cost needed to make the system sustainable. To that end, interim measures are recommended as follows:
  - A. Implement a customer charge of \$5.00 per EDU on residential customers and \$10.00 per EDU on commercial or non-residential customers per billing in an effort to build up a capital fund for water system improvements.

- B. Adopt whatever necessary resolutions to preserve that capital fund for use by the water system to avoid any “raiding” of the fund for other “non-water” uses in the future.
  - C. Before the end of FY 2021-22, re-analyze the revenue required to operate sustainably and implement a change in rate structure similar to the options shown above for the FY 22-23 fiscal year beginning July 1, 2022. For the reasons stated, this re-structuring will result in more equity for the customers and more consistent, sustainable revenue for the town. Before any final decision on the rates and rate structure, a second analysis of the actual costs from the 21-22 fiscal year should be conducted and SERCAP is available to do that at no charge to the town.
- 6. It is further recommended that the town conduct an inventory of its water lines and ages, along with a regular leak detection and tracking program to identify which lines may be past their useful life, and therefore another source of non-revenue water and lost revenue.
  - 7. Once the rate structure change is implemented, the town should analyze revenue needs annually and adjust rates accordingly, keeping them entirely cost-based, rather than simply adjusting from the previous year’s numbers.

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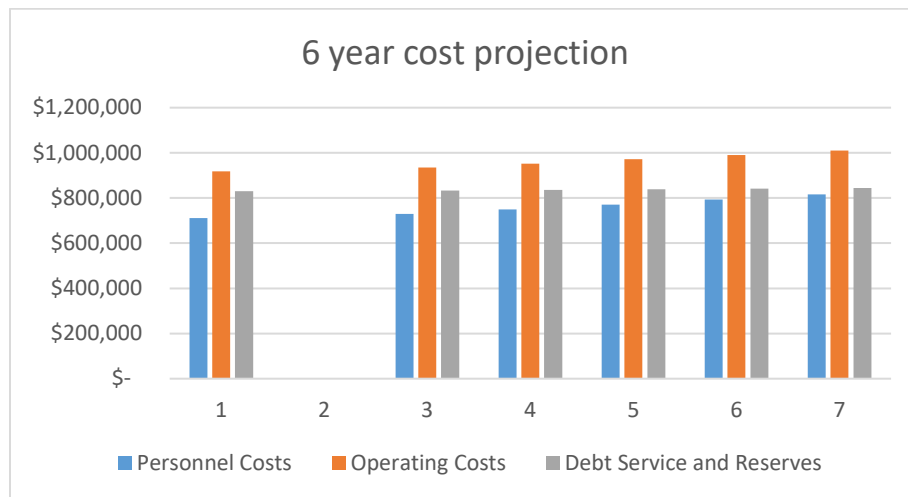
## *Wastewater Analysis and Recommendations*

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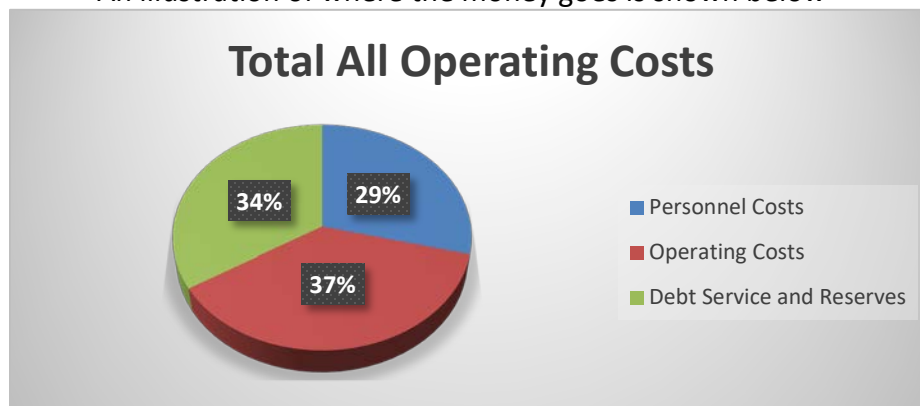
### System Costs and 5-year Cost Projection:

Berlin's expenses for the wastewater system were examined using FY 20 as the test year and expenses were projected for five years forward using a general inflation rate of 2% for most items with a slightly higher rate for specific items like insurance (10%) and reserves (3%). A summary of the results is shown below.

Cost Group	FY 2020	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	710,612	729,888	750,055	771,182	793,344	816,624
Operating	917,311	934,720	952,654	971,140	990,207	1,009,887
Debt & Reserve	830,378	832,990	835,680	838,453	841,313	844,265
<b>TOTAL</b>	<b>2,458,301</b>	<b>2,497,598</b>	<b>2,538,389</b>	<b>2,580,775</b>	<b>2,634,864</b>	<b>2,670,776</b>



An illustration of where the money goes is shown below

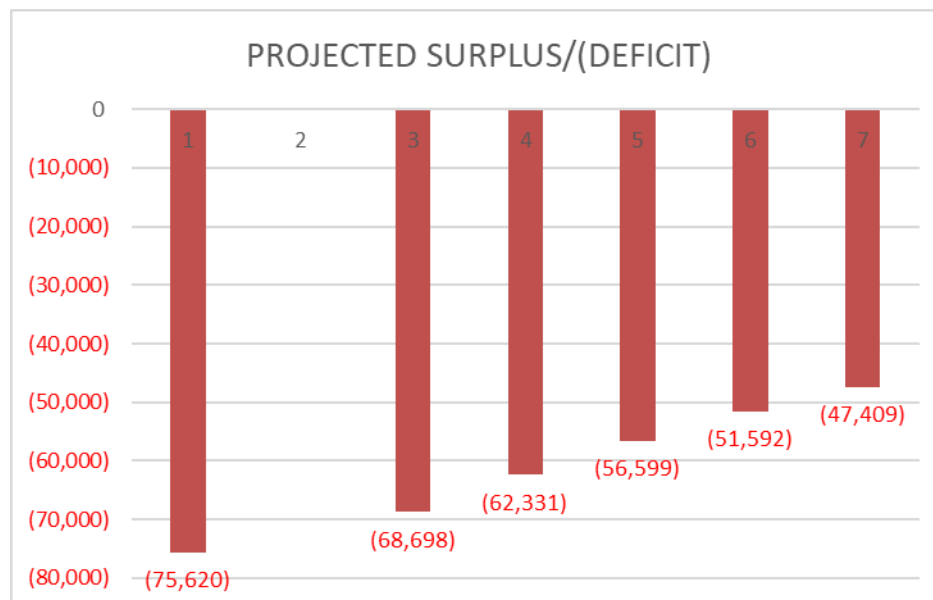




It is easy to see that the “pie” chart for Wastewater is quite different from the same illustration in the Water Section of this report. The cost centers are split almost evenly at 1/3 each, with Operating Costs equaling more than 1/3 of the total costs. HOWEVER, unlike the water utility, more than another 1/3 of all costs are for debt service and reserves. When reserves are removed from the calculation, Debt Service still amounts to 26% of total costs. This ratio of debt to other expenses is fairly high and should be less than 25% of total costs, excluding reserves.

#### **System Revenue and Revenue Requirement Projection:**

Revenue	FY 20	Year 1	Year 2	Year 3	Year 4	Year 5
Rate Rev Available	2,382,682	2,428,900	2,476,058	2,524,176	2,573,272	2,623,267
System Costs	2,458,301	2,497,598	2,538,389	2,580,775	2,624,864	2,670,776
<b>Surplus/ (Deficit)</b>	<b>(75,620)</b>	<b>(68,698)</b>	<b>(62,331)</b>	<b>(56,599)</b>	<b>(51,592)</b>	<b>(47,409)</b>



While the deficit lessens with each progressive year, that is largely because current debt is being paid down over the same period. Nevertheless, operating, personnel and reserve costs are all increasing for the same period so this is not an indication of a system that will eventually become solvent or sustainable once the individual debts are paid off. Further analysis shows that 29% of all revenue now goes solely to paying debt service. Even with the decreasing debt

that number only drops to 25% over the 6-year projection. This high ratio of debt to rate revenue will make it more difficult to secure further loans for capital improvements in the future. This heavy debt load also indicates that the system **is not sustainable under the present circumstances**, and that opinion has also been voiced by potential lenders like USDA.

As with the Water Analysis presented earlier, Costs projected for Year 1 were used to calculate rates rather than the test year, since the 2020 year had already elapsed and rates needed to be tied to future expenses to avoid getting further behind. Further, wastewater rates were calculated on the basis of water usage, as is the case with most customers, however it is recognized that there are always some customers who receive only water service and some who receive only sewer service. Unless these numbers are a significant portion of the customer base, that should not skew the results of this analysis.

#### **Observations and Comments on Costs/Revenues Analysis:**

Based solely on the amount of fixed costs – debt service and reserves – the current tiered minimum bill is too high and the \$8.50 per 1,000 gallons of water used is too low. That said, for the same reasons stated in the water portion of this report, a flat rate per EDU is a more effective method of covering fixed costs and results in a more consistent and predictable revenue stream.

The present rate structure appears to be somewhat inequitable, particularly to smaller volume users. Even at the highest monthly minimum of \$73.06, higher volume users are not paying their full share of total costs, while lower volume users are paying more than their share. The change in rate structure recommended will result in lower volume users saving money on their monthly bill, while higher volume users will pay slightly more. This is presented as a “true up” of the rate structure that, if adopted, will result in more equitable rates for the customers.

Average user is shown at 5,000 gallons of water used per month, pretty much a standard in the industry for illustration purposes. It is vitally important to remember the usage figures in the water portion of this report – that more than 71% of the customers use 5,000 gallons *or less* per month. Thus, any decision or choice of rates should be made with an eye toward the impacts on that group.

#### **Observations and Comments:**

1. As was stated in the water section of this report, the present use of a graduated base charge with a gallon allowance included, is not the most efficient way to recover fixed costs. A better, more equitable method, and the one recommended, is to assess a minimum or customer charge to each Equivalent Dwelling Unit as identified in the water rate structure (if adopted) and charge the per 1,000 usage from the first gallon of water used. That way there is a more consistent and predictable revenue stream NOT based on usage to cover the fixed costs, and a variable charge that is completely based on each -customer’s actual water usage. If the town wishes to establish tiered rates tied to usage, it should be done in the variable usage charge and not through the minimum or base customer charge.

2. The calculations so far show that low end water users will save on their sewer bills if a “true up” rate structure is adopted. The savings varies with the rate scenario eventually chosen, and the choice of which scenario, and therefore which customer group to protect, is a policy decision and not the purview of this report.
3. Debt is taking up an unusual amount of revenue – more than one third of total revenue and almost 30% of rate revenue. This ratio indicates an overextension and jeopardizes the system’s sustainability. In addition, the lack of financial sustainability will almost certainly affect the ability to obtain more funding as the system needs improvements or upgrades.

### **Conclusions and Recommendations:**

1. For both water and wastewater, it is recommended that the town adopt a different rate structure in the course of developing new rates. A flat fee per EDU with water and wastewater charged from the first gallon of usage is recommended. The present system is inequitable to lower volume users and higher volume users are not paying a fair share of fixed costs in proportion to their demand on the systems. These fixed costs represent the cost of installing the entire system and its eventual wearing out. Each customer should pay for some portion of those costs in proportion to the cost to serve them, BEFORE even a gallon of water is consumed. Charging that same rate to every Equivalent Dwelling Unit is the most equitable way to do that. If the town still wants a graduated or tiered user rate, it should be done in the variable charge portion of the rate structure.
2. As with the water system it is understandably difficult to change rates, let alone rate structures in the middle of a fiscal year, and without a concerted public education effort to prepare customers for the changes. With that recognition, interim measures for FY21-22 are recommended as follows:
  - a. Implement a customer charge of \$14.50 per EDU on residential customers and \$29.00 per EDU on commercial or non-residential customers per billing in an effort to build up a capital fund for water system improvements. These amounts are based on the \$5/\$10 charges proposed for the water system times 2.9, since wastewater is 2.9 times more expensive than water.
  - b. Adopt whatever necessary resolutions to preserve that capital fund for use by the water system to avoid any “raiding” of the fund for other “non-wastewater” uses in the future.
  - c. Before the end of FY 2021-22, re-analyze the revenue required to operate sustainably and implement a change in rate structure similar to the options discussed for the FY 22-23 fiscal year beginning July 1, 2022. Before any final decision on the rates and rate structure, a second analysis of the actual costs from the 21-22 fiscal year should be conducted and SERCAP is available to do that at no charge to the town.

3. For both water and wastewater, it is recommended that a water audit be conducted as soon as possible to discover how much of the non-revenue water is actual loss. If it is indeed all actual gallons lost, a comprehensive leak detection program is recommended, along with the recommended meter replacement program. If a large portion of that non-revenue amount is due to computer, clerical or accounting, then an examination of the present system to close any gaps is recommended. The cause is likely to be a combination of both.
4. Identifying the non-revenue water source is just as important for the Wastewater system as it is for the Water system because sewer billing is based on water usage. Thus, loss of water revenue means loss of sewer revenue as well. Since wastewater service is nearly three times more expensive than water service, the un-accounted for water creates an even more profound effect on the wastewater system.
5. Whether the exact rates and charge numbers shown in this report are ultimately chosen is a decision for the policy makers to make. Whatever objective numbers are chosen, the recommendations for re-structuring the rates are the same, and adoption of this different structure is strongly encouraged.
6. The town should examine its current debt load and try to identify ways that it can be reduced through re-financing or other means. Paying down the debt by whatever means, can result in a more sustainable utility, and also improve the chances of obtaining funding for future improvements and upgrades as the need arises.
7. Should there be a need for an out-of-town charge a multiplier of 1.25 is recommended, in the absence of actual cost figures showing the differential in cost to serve in-town and out-of-town.
8. If a flat rate for customers who have no measured water service is needed that can be calculated separately once a rate scenario is chosen.

# Water and Wastewater Analysis for the Town of Berlin



**Presented by: Jean Holloway**

**Southeast Rural Community Assistance Project (SERCAP)**

**October 12, 2021**



# Rural Community Assistance Partnership, Inc.

## Western

Rural Community  
Assistance Corporation  
916/447-2854  
[www.rcac.org](http://www.rcac.org)

## Midwest

Midwest Assistance Program  
952/758-4334  
[www.map-inc.org](http://www.map-inc.org)

## Southern

Communities Unlimited  
479/443-2700  
[www.crg.org](http://www.crg.org)

## Northeast

RCAP Solutions  
800/488-1969  
[www.rcapsolutions.org](http://www.rcapsolutions.org)

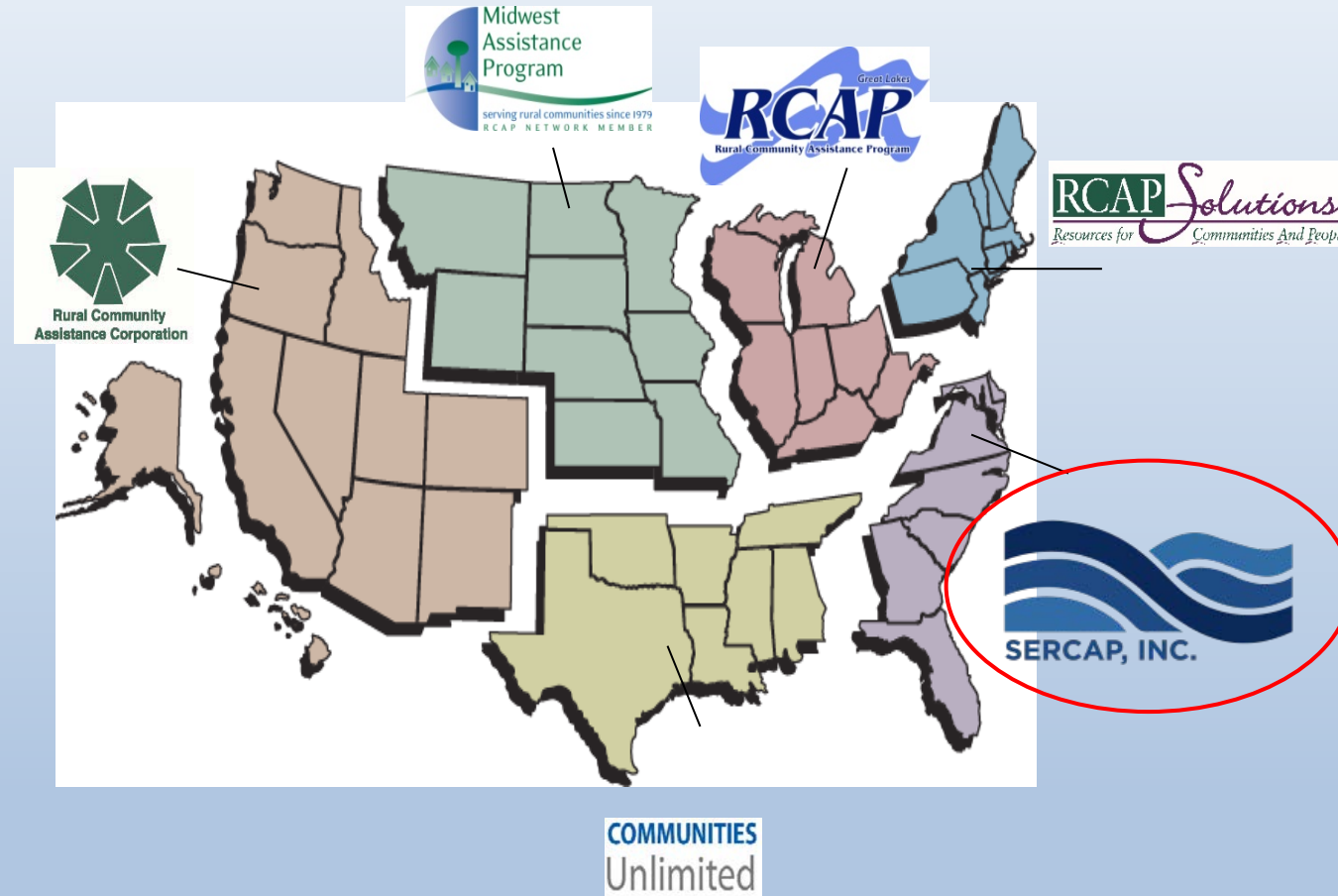
## Great Lakes

WSOS Community  
Action Commission  
800/775-9767  
[www.glrca.org](http://www.glrca.org)

## Southeast

Southeast Rural Community  
Assistance Project  
866/928-3731  
[www.southeastrcap.org](http://www.southeastrcap.org)

800/321-7227 [www.rcap.org](http://www.rcap.org)



# Background



- Original work began in the summer of 2019
- A presentation was made to the Mayor and Council on 8/26/2019
- Before all the information was gathered and analyzed COVID struck
- By agreement with the management team, a rate change was not possible during the pandemic shutdown and economic downturn
- Work began again toward the end of 2020 to evaluate both system's \$\$
- A second, virtual presentation was made on 12/14/20 on projected needs
- Data was updated and rate analysis began again in early 2021
- Several meetings to go over results yielded a final report for tonight

# FIRST, Some basic principles... *(pgs 2-4)*

- The goal is always FULL Cost Recovery – no matter how you slice the pie, the costs will not change *(Page 2)*
- 3 things to do before a rate change *(Page 3)*
  - Reduce or eliminate the gallon allowance included in any minimum charge
  - Get a handle on non-revenue water
  - Make sure collections are at an optimum level – at least 95% of billing
- Reserves should be viewed as a cost of operation
  - The system will eventually need replacement and/or upgrade
  - The wearing out of that system is caused by the users/connections
- Fixed costs should be covered by a fixed charge and variable costs by a volumetric user charge



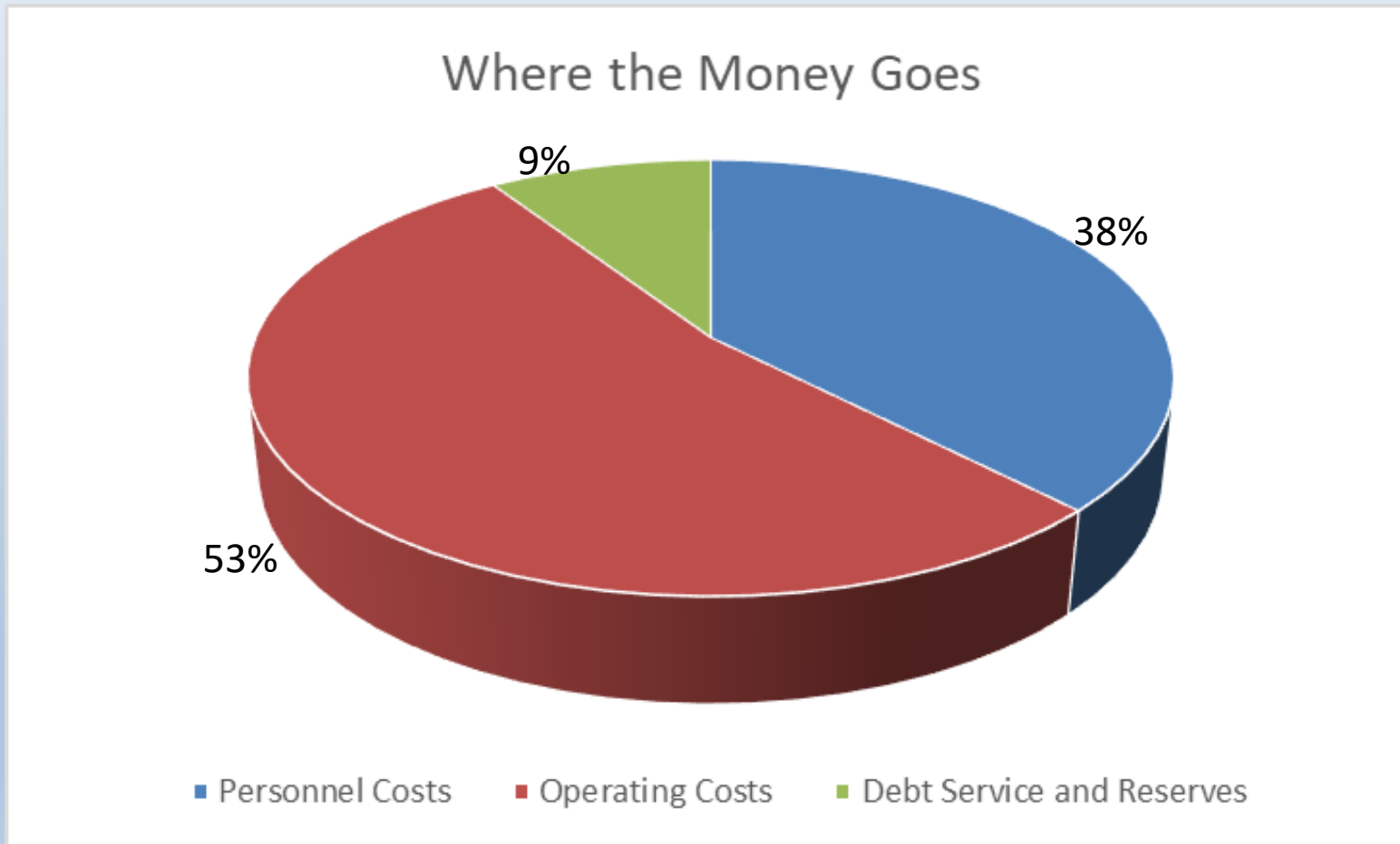
# Water Rate Analysis



# 6-year Cost Projection

Cost Group	FY 2020	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	\$ 319,310	\$ 327,737	\$ 336,538	\$ 345,739	\$ 355,371	\$ 365,467
Operating	\$ 449,939	\$ 459,673	\$ 469,675	\$ 479,959	\$ 490,537	\$ 501,424
Debt & Reserves	\$ 78,739	\$ 81,101	\$ 83,535	\$ 86,041	\$ 88,622	\$ 91,280
<b>TOTAL</b>	<b>\$ 847,988</b>	<b>\$ 868,512</b>	<b>\$ 889,748</b>	<b>\$ 911,738</b>	<b>\$ 934,530</b>	<b>\$ 958,172</b>

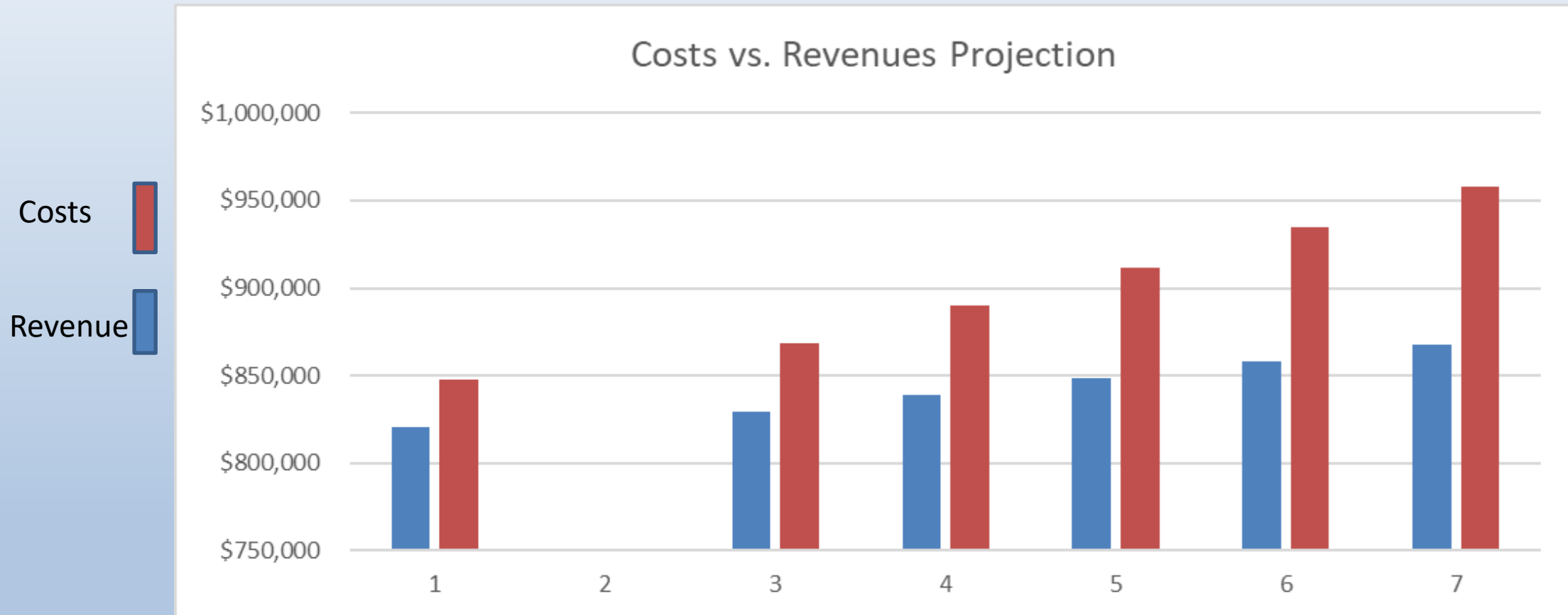
# Where the money goes...



# 6-year Revenue Projection

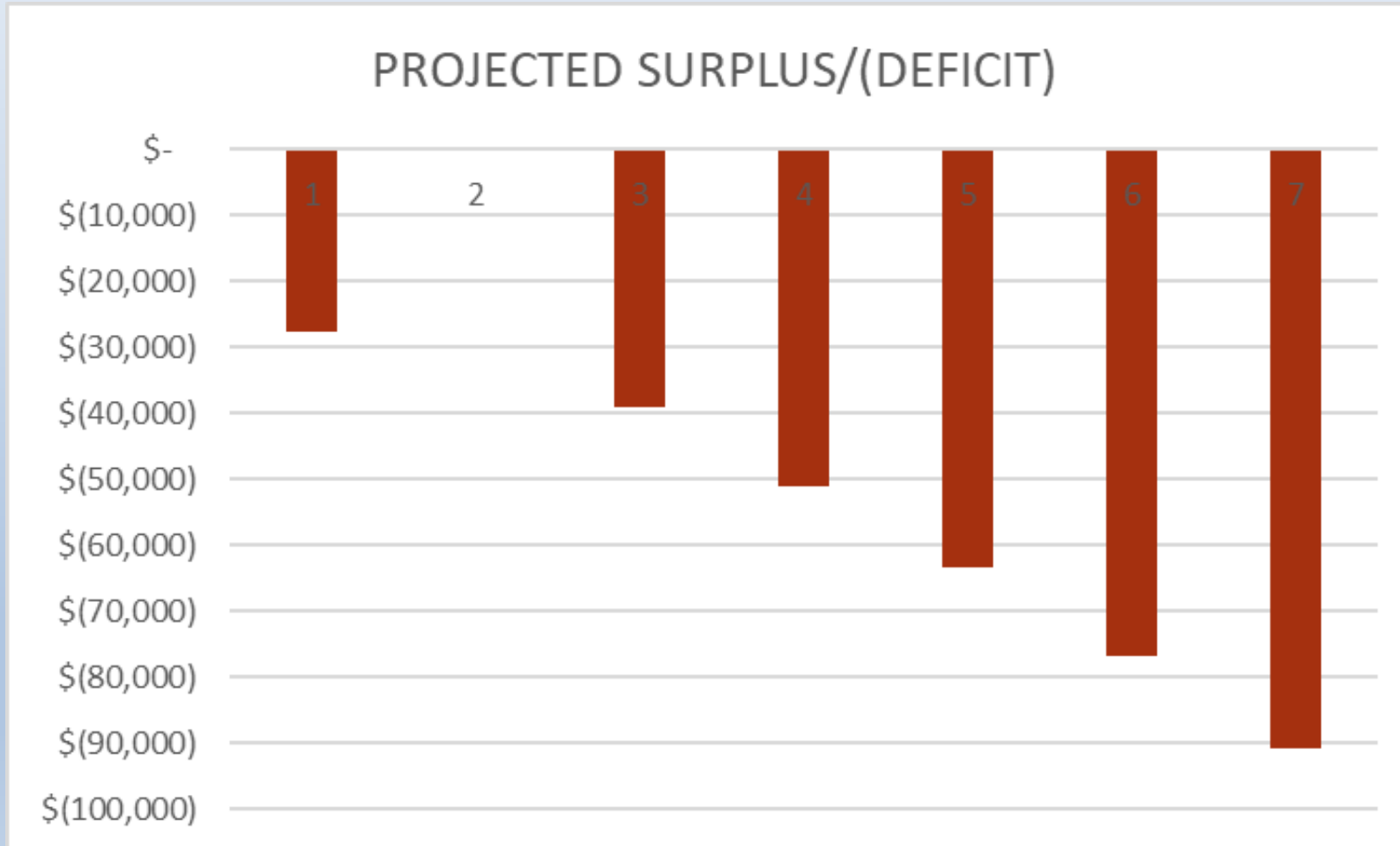
Revenue	FY 20	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue Available	\$ 820,240	\$ 829,451	\$ 838,773	\$ 848,210	\$ 857,762	\$ 867,430
Costs	\$ 847,988	\$ 868,512	\$ 889,748	\$ 911,738	\$ 934,530	\$ 958,172
Surplus/ (Deficit)	\$ (27,747)	\$ (39,061)	\$ (50,974)	\$ (63,528)	\$ (76,768)	\$ (90,742)

# In other words...



Costs currently exceed rate revenues by a substantial amount and the gap only gets wider

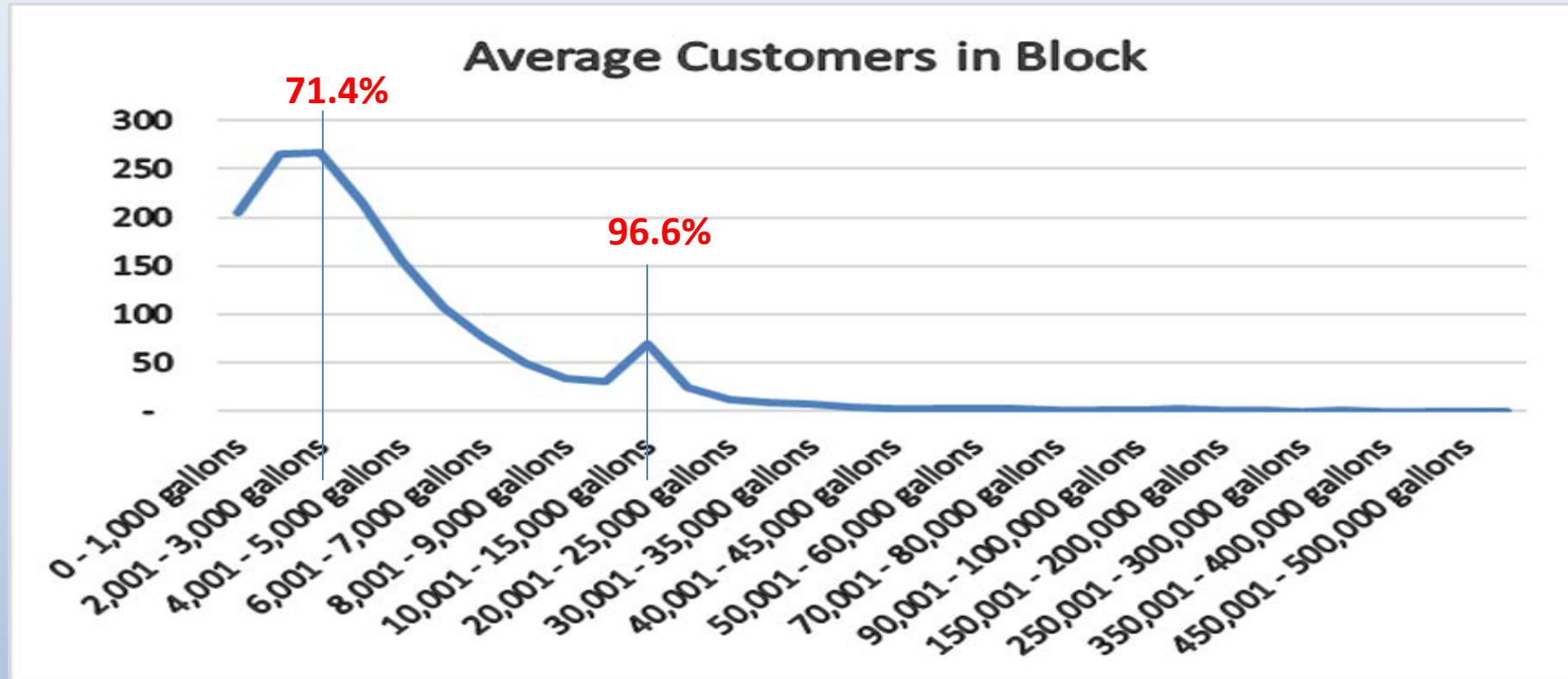
# The Deficit Grows...



# Non-revenue Water

- The % of water that is produced and treated but for which no revenue is received
- Ideal is 10% of production, and 15% is acceptable
- Berlin's loss is almost 25% or 42,600,000 gallons for 2020
- At a rate of \$4.80 per 1,000 gallons that equates to \$204,000 in un-recovered revenue
- Some of that may be clerical error, filter backwash, line loss, fire flows, etc. BUT the major source is likely insufficient metering
- If even half is attributable to actual gallons lost that is over \$100,000 un-recovered costs annually

# Average Customers by Usage Block



Over 71% of the customers use 5,000 gallons or less per month.  
Over 95% use less than 20,000 gallons.



# Observations and Comments

- Despite lack of debt, the system is not recovering its costs of operation through rates
- The system is not sustainable under the present circumstances and current rate *structure*
- Replacing meters *alone* will not make it sustainable
- Current rate structure is inefficient at recovering fixed costs and adequate variable costs
- To recover fixed costs the base charge could be lower, but the usage rate would then have to be more than 50% higher –

**not recommended!**



# Recommendations

- Replace meters with a system that reads every gallon from the first 1
- Conduct a water audit to see what other sources of non revenue water may be the cause
- Institute interim rate measures for remainder of FY 21-22 to begin building a capital reserve for replacement and improvements
- Re-structure rates beginning FY 22-23 on 7/1/22
  - Minimum charge per EDU as defined in the report to recover fixed costs
  - Usage charge per 1,000 gallons based on variable costs
- Re-evaluate costs based on 12/31/21 figures before deciding on actual rate figures for FY 22-23 or beyond

# *Recommendations* for the Interim

- For the balance of FY 21-22 (ending June 30, 2022) begin building a capital reserve fund
  - Add \$5.00 per residential EDU per billing dedicated to a capital reserve fund
  - Add \$10.00 per commercial EDU per billing dedicated to the same reserve fund
  - Adopt sufficient resolutions and procedures that prevent the resulting fund from being used for anything other than water capital improvements
- Re-analyze all costs based on 12/31/21 ending figures for production as well as spending
- Use these figures to arrive at new rates and rate structure for FY 22-23

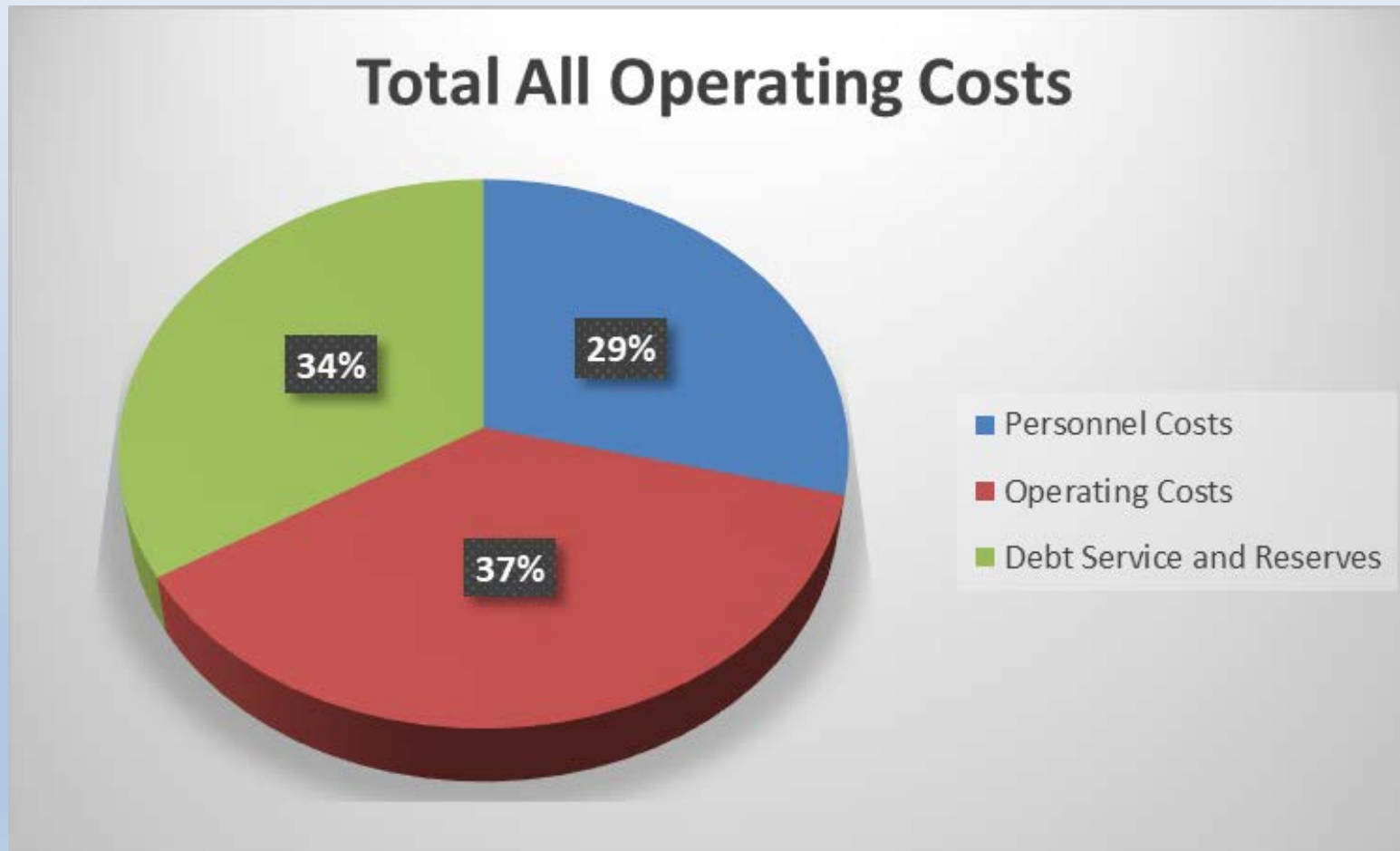
# Wastewater Rate Analysis



# 6-year Cost Projection

Cost Group	FY 2020	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel	710,612	729,888	750,055	771,182	793,344	816,624
Operating	917,311	934,720	952,654	971,140	990,207	1,009,887
Debt & Reserve	830,378	832,990	835,680	838,453	841,313	844,265
<b>TOTAL</b>	<b>2,458,301</b>	<b>2,497,598</b>	<b>2,538,389</b>	<b>2,580,775</b>	<b>2,634,864</b>	<b>2,670,776</b>

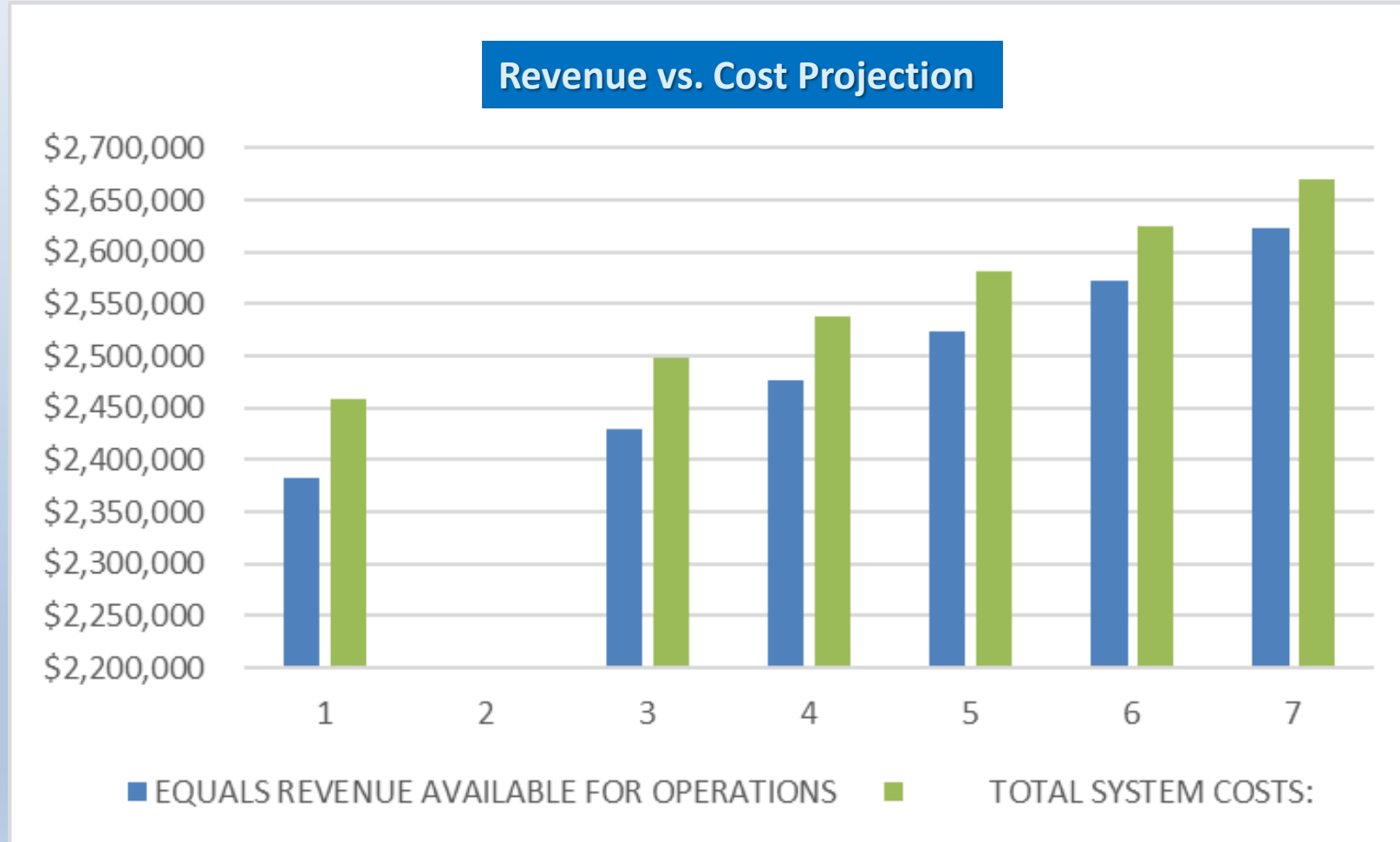
# Where the Money Goes...



# 6-year Revenue Projection

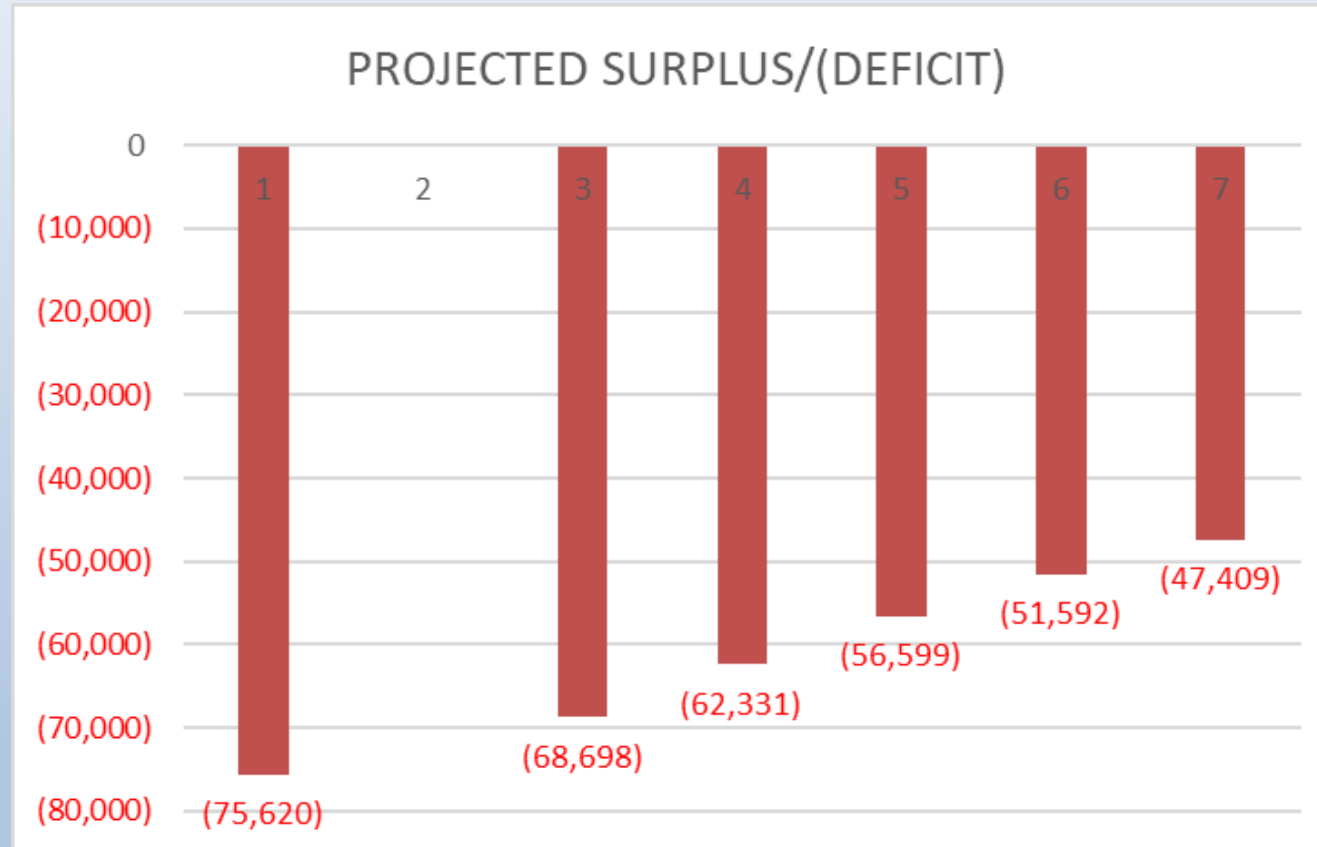
Revenue	FY 20	Year 1	Year 2	Year 3	Year 4	Year 5
Rate Rev Available	2,382,682	2,428,900	2,476,058	2,524,176	2,573,272	2,623,267
System Costs	2,458,301	2,497,598	2,538,389	2,580,775	2,624,864	2,670,776
Surplus/ (Deficit)	(75,620)	(68,698)	(62,331)	(56,599)	(51,592)	(47,409)

# In Other Words...





# The Deficit Decreases...



Even though the deficit decreases over time, that does **not** mean the system will become sustainable. Costs will *inevitably* increase during the same period.

# Observations and Comments

- Wastewater service is 2.9 times more expensive than water
- The tiered base charge is too low by itself to recover fixed costs
- The current usage rate is higher than needed to recover variable costs
- Debt takes a huge portion of revenue collected – 30% of total and more than 1/3 of rate revenue
- Non-revenue water has an even more profound effect on revenue in the wastewater system
- 42,600,000 gallons at \$8.50/1,000 = **\$362,100 annually**

# Recommendations

- Re-structure rates similarly to recommended water rate structure:
  - Fixed charge per EDU to recover fixed costs
  - Usage charge per 1,000 gallons of water to recover variable costs
- Identify sources of non-revenue water through a water audit
- Institute interim measures and charges for the balance of FY 21-22
- Re-analyze based on 12/31/21 year end figures to arrive at new rates and structure for FY 22-23 beginning 7/1/22

# *Recommendations* for the Interim

- For the balance of FY 21-22 (ending June 30, 2022) begin building a capital reserve fund *[based on Sewer costs = 2.9X Water cost]*
  - Add \$14.50 per residential EDU per billing dedicated to a capital reserve fund
  - Add \$29.50 per commercial EDU per billing dedicated to the same reserve fund
  - Adopt sufficient resolutions that prevent the resulting fund from being used for anything other than wastewater capital replacement and/or improvements
- Re-analyze based on 12/31/21 ending figures for production as well as spending
- Use these figures to arrive at new rates and rate structure for FY 22-23

# In Conclusion

- Neither the water nor the sewer system is financially sustainable under the present circumstances and rate structure
- Lack of sustainability affects the credit worthiness and ability to get funding for future capital improvements – loan OR grant
- Old and insufficient metering is definitely part of the problem, but meters alone will not make the systems sustainable
- The present rate structures are inequitable with some users paying more than their share and others paying less
- A capital reserve needs to be established starting immediately for both utilities in anticipation of replacement and improvement needs

# Water and Wastewater Analysis for the Town of Berlin



**Presented by: Jean Holloway**

**Southeast Rural Community Assistance Project (SERCAP)**

**October 12, 2021**

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