

Sewer Rate Study

October 2022

Prepared for:



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EXECUTIVE SUMMARY

INTRODUCTION

Midvalley Improvement District (MID or District) last updated its service charges in September of 2019. Since that time, there have been several changes in the District. The District faces capital improvement costs, bond service costs (via agreements with South Valley Water Reclamation Facility), as well as maintenance and operation costs which will likely increase in the years to come. Historically high inflation is also affecting the District's ability to keep up with construction costs and escalation in O&M costs. The purpose of this study is to update the District's sewer service charges. Implementing the recommendations contained in this report will assist the District in adequately funding potential infrastructure improvements and staying on track with projected operation budgets.

SEWER RATE ANALYSIS

The primary objective of this sewer rate analysis is to establish fair and equitable rates that will be sufficient to meet revenue requirements for the District. To accomplish this goal, this analysis focused on six major tasks:

- 1. Projecting Growth:** The MID system is currently composed of 11,158 equivalent residential units (ERUs) and 310 commercial ERUs as defined by District personnel for rate collection. Projected redevelopment within the District is anticipated to significantly increase the number of ERUs within the District within the next 10 years. However, even if pending redevelopment projects get started soon, it will still take a number of years before projects are occupied with revenue contributing users. For revenue projections, it would not be prudent to assume a significant change in the number of ERUs over the next 3 to 5 years as a result of 10-year redevelopment plans. Therefore, for the purpose of the rate study, growth projections over the next four years have been assumed to match the residential growth rate from 2020 to 2021 (0.37 percent) with and assumed increase to 0.80 percent in 2026 and 2027 as anticipated growth arrives.
- 2. Calculating Revenue Requirements:** Total revenue requirements for the District were projected for the next several years. Those requirements included operations and maintenance costs, capital improvement costs, facilities rehabilitation/replacement costs, and debt service. Revenue generated outside of sewer rates (taxes, impact fees, interest income, and penalty fees) was deducted from the total to give the net revenue requirement to be recovered from service charges.
- 3. Comparing Revenue to Required Revenue:** Once revenue requirements are projected, it is possible to compare required revenue to revenue projections. The District has historically been able to fund most projects without bonding and consequently has been able to minimize interest charges that might otherwise be required for capital projects. The District's last rate increase helped to keep revenue above District costs, but increasing O&M costs associated with higher treatment costs and inflation have reduced available revenue. In addition, several large capital projects expected in the next few years could deplete District savings without a rate increase.
- 4. Developing a Funding Plan to Meet Projected Needs:** In order for the District to meet projected expenditures and maintain its savings fund, it is important that revenue be sufficient to accommodate future projects. This study develops a plan to maintain funding levels appropriate to provide the desired level of service in the wastewater system.

5. **Allocating Costs to Customers:** This analysis generally followed the design cost-causative procedure recommended by the Water Environment Federation (WEF), American Society of Civil Engineers (ASCE), and American Public Works Association (APWA). The essential principle of this method is that sewer rates should be recovered from customers in proportion to the cost of serving customers.
6. **Calculating Final Sewer Rates:** Sewer rates were calculated to recover the allocated cost of service based on operation and maintenance costs, debt service, and capital improvement costs.

The recommended increases to the sewer rates shown in Table ES-1 reflect a multiple year rate schedule needed to meet the cost of capital improvements and system renewal. The District expressed a desire to implement a larger initial rate increase in 2023 with smaller rate increases over the next 5 years. After the initial increase to catch up with recent inflation effects, the District needs to continue rate increases to account for significant capital improvement costs at South Valley Water Reclamation Facility (SVWRF) anticipated over the next 10 years.

**Table ES-1
Calculated/Recommended Rates**

Customer Class	Current Sewer Rate	2022	2023	2024	2025	2026	2027
Residential Users	\$24.50	\$24.50	\$27.90	\$30.70	\$33.80	\$37.20	\$40.90
Commercial Users	\$24.50	\$24.50	\$27.90	\$30.70	\$33.80	\$37.20	\$40.90
Rate Increase Percentage							
Residential Users		0.0%	14.0%	10.0%	10.0%	10.0%	10.0%
Commercial Users		0.0%	14.0%	10.0%	10.0%	10.0%	10.0%

As shown in Figure ES-1, the District's existing rates are currently one of the lowest of any of the sewer service entities surveyed as part of this study. With the rate increases shown in Table ES-1, the cost of service in MID will still remain near the lowest of the entities compared. The proposed rate increases therefore appear to be reasonable.

RECOMMENDATIONS

It is recommended that the service charges summarized in Table ES-1 be adopted by the District. The proposed rates should be re-evaluated in approximately five years to ensure that the District's revenue requirements and goals are being met.

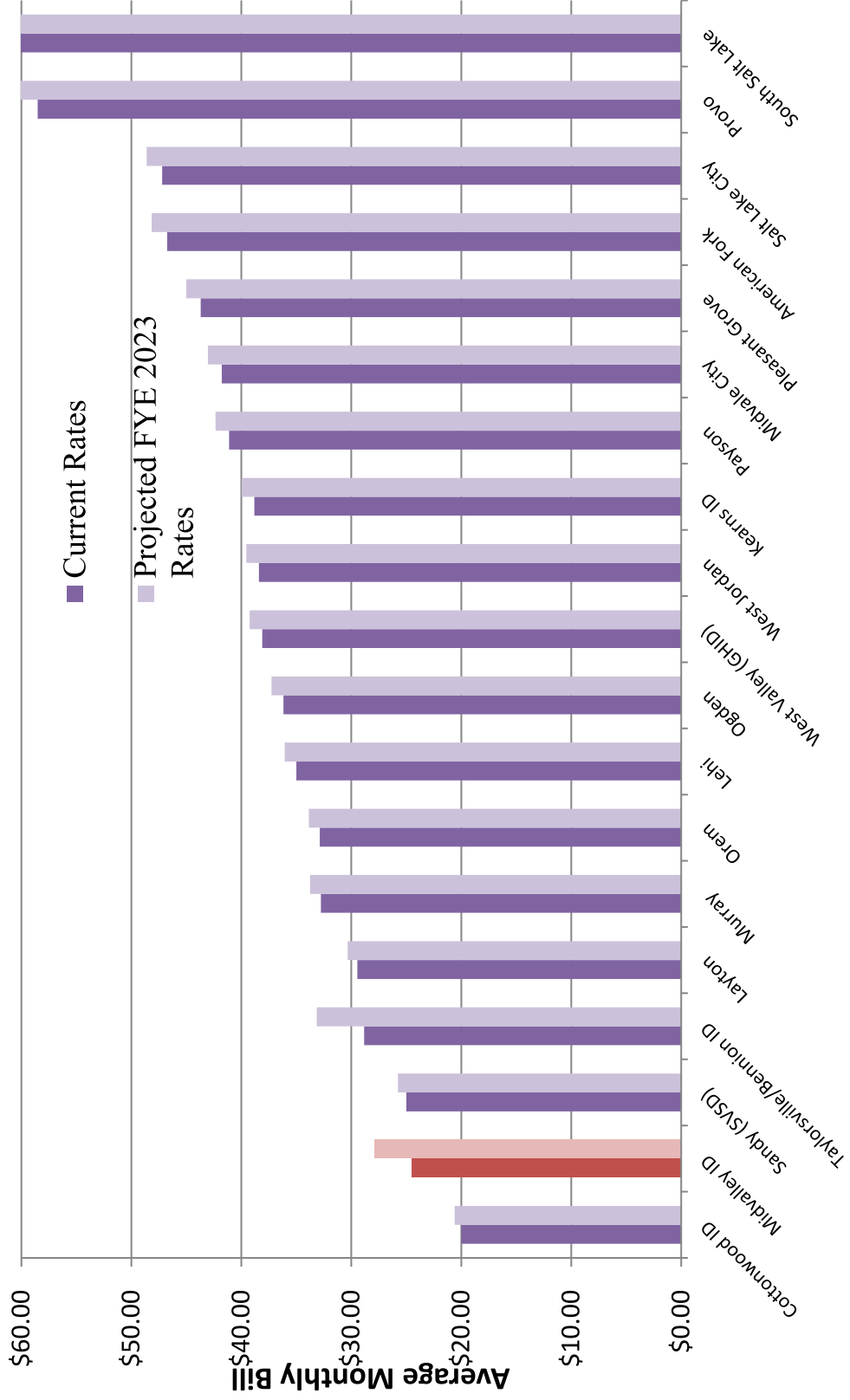


Figure ES-1: Comparison of Average Monthly Sewer Charges, Average Residential Customer

SEWER RATE ANALYSIS

INTRODUCTION

The purpose of this rate study is to update Midvalley Improvement District's sewer rates based on changes in demand patterns and system revenue requirements that have occurred since the District last established rates. The rate study will calculate detailed rates for the next six years and present a finance plan to achieve the District's primary objectives of:

- Maintain high quality and reliable sewer service at affordable prices for customers;
- Sustain stable revenue generation adequate to fund system needs; and
- Minimize the District's long-term costs by avoiding further debt where possible.

Implementing the recommendations contained in this report will help MID keep its sewer system adequately funded to maintain its current infrastructure and continue to provide dependable service to its customers.

PROJECTED REVENUE NEEDS

Before calculating detailed rates for individual users, it is important to consider the overall plan for meeting the future revenue needs of the District. The first step in this process is to project future expenditures. Historic and projected expenditures for the District from 2022 to 2029 are shown in Figure 1. Future expenditures can be grouped into three categories:

- **Operation and Maintenance Expenditures** – These are the annual costs of running the system. They include items such as salary and benefit costs for District staff, equipment and supplies, power costs, system repairs, and all other costs associated with doing business throughout the year. Operation and maintenance (O&M) costs are relatively constant from year to year and tend to grow with the rate of inflation.
- **Debt Service** – These are the costs paid toward bonds taken out by the District in previous years. These costs are easily predictable because they are tied to set payment schedules for each bond. The District does not currently have any active debt service but expects it may need to take out a bond for future expenditures. In general, the District strives to avoid bonding whenever possible to avoid finance charges.
- **Capital Improvement Expenditures** – These are costs for constructing new facilities within the District. This can include completely new facilities or replacement of existing facilities. Capital improvement expenditures are usually the most volatile of expenditure categories. Because O&M and debt service costs are basically fixed, budgets are usually balanced by increasing or decreasing capital improvement expenditures as necessary. There are a number of capital improvement projects that will affect the District's savings balance over the next five to ten years including pipe replacement projects needed to serve redevelopment and treatment plant upgrades.

10-YEAR BUDGET PLAN

With the expected expenditures outlined above, it is possible to prepare a future budget plan. A budget plan has been developed and is shown with projected expenditures in Figure 1. The process of creating this budget plan was as follows:

1. **Identify projected revenue based on existing sewer rates** – Using the District’s existing sewer rates, Bowen, Collins & Associates (BC&A) calculated the revenue the District could expect to receive over the next 10 years. These projections include consideration of future system growth.
2. **Compare projected revenue to required revenue** – Once revenue projections have been developed, it is possible to compare revenue projections to required revenue. As can be seen in Figure 1, projected revenue based on existing rates (the solid black line) begins to fall short of operation and maintenance costs beginning in 2023. In addition, large capital cost expenses in the next few years use up a significant portion of the District’s existing savings. To satisfy future bond covenants and to fund projected revenue requirements, a rate increase will definitely be needed.
3. **Identify recommended level of funding based on long-term system needs** – As with most things, each component of a sewer system has a finite service life. As such, it is necessary to continually budget money for the rehabilitation or replacement of these system components. If adequate funds are not set aside for regular investment into the system, the system will fall into disrepair and be incapable of providing the level of service customers in the District expect. To maintain the sewer system in good operating condition, it is recommended that the District’s annual investment into the system be approximately equal to the replacement value of the system divided by its estimated service life.

Based on the 2022 Sewer Master Plan, the District’s has set an infrastructure investment goal of \$991,000 per year (2022 dollars) related to lining most of the District’s concrete pipelines within 10 to 20 years with a goal of \$500,000 per year related to rehabilitating most of the District’s concrete manholes (~40-year window for lining manholes). By lining pipes and manholes, the District hopes to extend the useful life of sewer pipes and manholes to 100 years or more. In addition to the District collection system, the SVWRF also has significant capital facility investments needed to both need new treatment requirements and maintain the facility. SVWRF anticipates spending approximately \$600,000 per year over the next 10 years (this is the District’s portion of costs) on treatment improvements. These investment amounts can be refined in the future as the District develops a more detailed asset management plan, but has been used in this study as the basis for future system investment.

In addition to the system investment goal, the District would like to replenish its savings balance to be able to meet unexpected capital project costs without needing to bond. To accomplish this, the District would like to maintain a rough balance of \$4 million in savings to help fund urgent projects that may come up and avoid future debt (bonding).

If the recommended system investment budget identified above is added to the District’s projected O&M costs, the total represents an estimate of recommended long-term level of funding based on system needs.

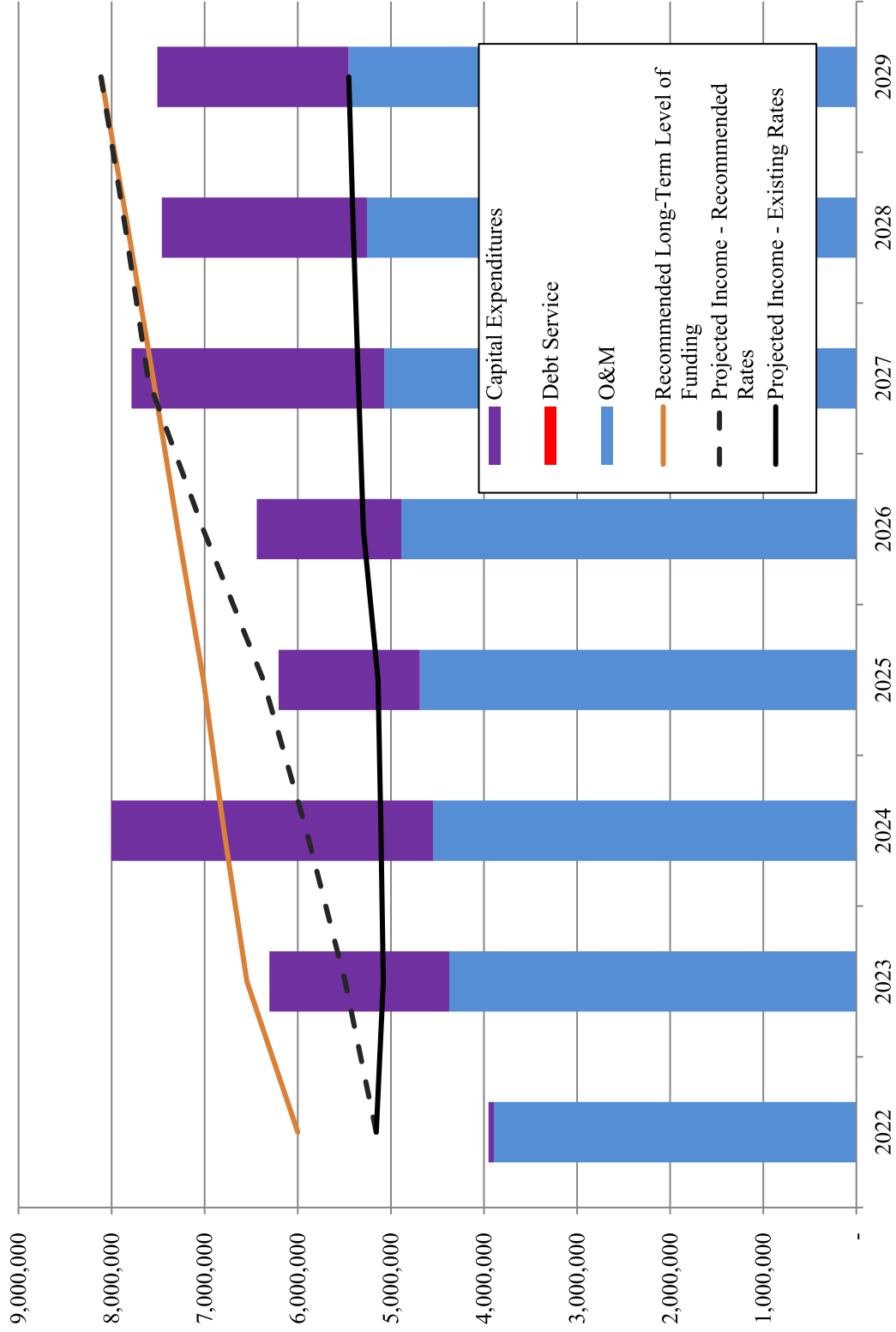


Figure 1: 10-Year Revenue and Expenditures – M.I.D. Sewer

4. **Create a plan to transition from existing revenue to revenue adequate to support long-term system needs** – To close the gap between projected revenue from existing rates and recommended revenue for long-term system needs, it is recommended that existing rates be increased over the next several years. To meet projected revenue needs (including large short-term capital projects), a large initial increase will be required next year followed by more moderate increases the next few years. After the initial transition period to bring rates up to the recommended sustainable long-term level of funding over the next few years, annual increases can be reduced to reflect normal inflation. To generate the revenue shown in the budget plan in Figure 1, approximate annual increases to existing rates will need to be as shown in Table 1.

Table 1
Recommended Annual Rate Increases for the 10-Year Budget Plan

Year	Percent Rate Increase
2023	14.0%
2024	10.0%
2025	10.0%
2026	10.0%
2027	10.0%
2028	3.0%
2029	3.0%

5. **Modify capital improvement expenditures to fit within the identified budget** – As noted previously, there is not much change that can be made to O&M or debt service expenditures (for SVWRF). Therefore, any modifications required to meet the recommended budget plan will need to come through capital improvement expenditures. The capital expenditures shown in Figure 1 represent the level of expenditures that can be supported by the budget plan. A detailed outline of available capital expenditures for each year is contained in the rate model described in subsequent sections of this report.
6. **Replenish savings balance** – Presently, the District has an approximate balance of \$4,400,000 in savings. The District anticipates using up most of this balance within the next few years as a result of both maintenance and expansion projects needed for redevelopment within the District. The proposed 10-year budget plan will include transfers into and out of the District’s savings based on the timing of capital improvements and system revenue.

Figure 2 shows the anticipated 10-year savings fund balance with expected transfers into and out of savings based on system revenue and capital improvement projects (including scheduled projects listed in the 2022 Sewer Master Plan). The capital expenses for the yet to be determined system replacement and rehabilitation projects (part of the long-term level of funding for system investment) may be adjusted to meet District needs OR to replenish its target \$4,400,000 savings balance more quickly.

DETAILED RATE CALCULATION

With an overall revenue plan in place, the next step in the rate calculation process is a detailed cost-of-service rate analysis. This analysis focuses on four major tasks:

1. **Projecting Sewer Use:** Future sewer sales were estimated by examining current use patterns and by projecting sewer system growth for the next several years.
2. **Calculating Revenue Requirements:** Total revenue requirements of the system were projected for the next several years based on the budget plan outlined earlier in this chapter. Non-rate revenue (including impact fee and tax revenue) was deducted from the total to give the net revenue requirement to be recovered from rate payers.
3. **Cost Allocation:** This analysis generally follows the design cost-causative procedure recommended by the Water Environment Federation (WEF), American Society of Civil Engineers (ASCE), and American Public Works Association (APWA)¹. The essential principle of this method is that wastewater revenue should be recovered from classes of customers in proportion to the cost of serving those customers. All connections have been grouped into two customer classes resulting in a standard rate for each class.
4. **Wastewater Rate Design:** Wastewater rates were calculated to recover the allocated cost of service based on operation and maintenance costs and capital improvement costs.

The remainder of this report details the results of each of these four major tasks. Detailed rate tables from the model used to develop the rate recommendations are in the Appendix.

¹Water Environment Federation, American Society of Civil Engineers, and American Public Works Association. Financing and Charges for Wastewater Systems, 1984.

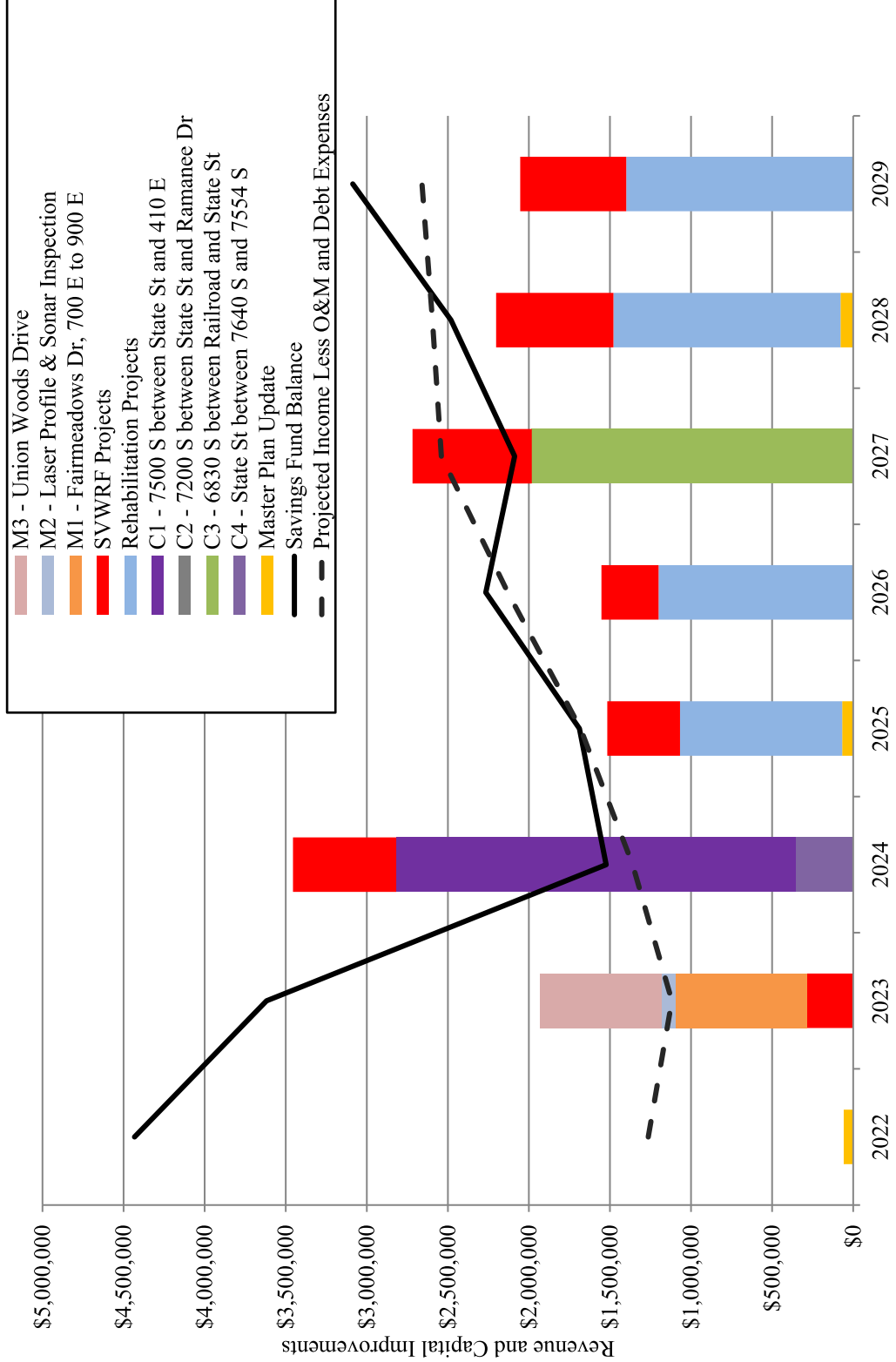


Figure 2: 10-Year Savings Fund Balance – M.I.D Sewer

KEY ASSUMPTIONS

The results presented in this report are based on the following assumptions:

1. The District operating fund will continue to be a self-funding enterprise fund.
2. The study follows the basic recommended methodologies of the joint publication, "Financing and Charges for Wastewater Systems". Only the "cash basis" approach has been used to allocate costs to users. This is somewhat simplified because the District does not currently charge rates on a volume basis.
3. This wastewater rate study is based on projections of future wastewater production and projected system operation, maintenance, and improvement costs. These projections are based on current economic conditions and wastewater use patterns. Because conditions may change over time, it is recommended that the District review the wastewater rates periodically and adjust them as needed to provide a revenue stream that will adequately fund operation and maintenance costs as well as needed rehabilitation and replacement projects. It is also recommended that a comprehensive review and updating of wastewater rates be undertaken in three to five years so that the basic analytical foundations of this study can be re-evaluated.

PROJECTING WASTEWATER PRODUCTION

Historic Indoor Water Use

The District currently provides sewer service to approximately 6,636 accounts composed of approximately 11,478 ERUs. The District separates accounts into two classes as described below:

- **Residential** – This class represents all the residential customers connected into the MID sewer system. Based on information provided to BC&A, this customer class currently accounts for approximately 97.3% of all ERUs in the system. Each residential unit is assumed to be 1 ERU by the District. The volume and strength of wastewater flows are not differentiated within this class.
- **Commercial** – This class of customers contains all other non-residential customers. Each account in this class is assigned a number of ERUs based on its projected wastewater flows by District staff. This class accounts for the remaining 2.7% of the total ERUs in the system. The strength of wastewater flows is not differentiated within this class.

MID does not meter sewage flows for individual customers. Lacking direct information on flow rates, the Sewer Master Plan estimated the typical sewer flow rate was 164.8 gallons per residential unit per day based on average indoor water use obtained from Sandy City water meter data during winter months (when culinary water flows should closely match sewer discharge flows). The number of accounts in each customer class, along with their estimated sewer flows in 2022, is summarized in Table 2.

Table 2
2022 Account and Sewer Use Summary

Customer Class	Number of Accounts in 2022	Number of ERUs in 2022	2022 Sewer Flows (kgal) ¹	Average Monthly Flows/ERU (kgal) ¹
Residential Users	6,330	11,166	671,208	5
Commercial Users	306	312	18,656	5
Total	6,636	11,478	689,864	5

¹ Based on an estimated 164.8 gal/residential unit/day average flow and a total system flow of 1,836,429 gal/day

Projected Growth

Relatively little area within the District's service boundaries is undeveloped. Therefore, growth is expected to be primarily the result of potential redevelopment activities. Projected redevelopment within the District is anticipated to significantly increase the number of ERUs within the District within the next 10 years. However, even if pending redevelopment projects get started soon, it will still take a number of years before projects are occupied with revenue contributing users. For revenue projections, it would not be prudent to assume a significant change in the number of ERUs over the next 3 to 5 years as a result of 10-year redevelopment plans. Therefore, for the purpose of the rate study, it has been assumed that growth projections over the next four years will match the residential growth rate from 2020 to 2021 (0.37 percent) and that they will increase to 0.80 percent in 2026 and 2027 and match sewer master plan growth rates. The projected growth rates and number of ERUs by customer type are summarized in Table 3.

Table 3
Projected System Growth (ERUs)

Customer Class	2022	2023	2024	2025	2026	2027
Residential Users	11,158	11,199	11,241	11,283	11,373	11,464
Commercial Users	310	311	312	314	316	319
Total	11,468	11,511	11,553	11,596	11,689	11,782
% Residential Growth	0.37%	0.37%	0.37%	0.37%	0.80%	0.80%
% Commercial Growth	0.37%	0.37%	0.37%	0.37%	0.80%	0.80%
% Combined Growth	0.37%	0.37%	0.37%	0.37%	0.80%	0.80%

Projected Sewer Flows

Future sewer demands were projected by multiplying the average use per account in 2022 from Table 2 by the projected number of accounts in Table 3. Using this methodology, the projected growth in total sewer flows are shown in Table 4.

Table 4
Projected Growth in Sewer Flows

Customer Class	Use per Account	Flow Amount (kgal)					
		2022	2023	2024	2025	2026	2027
Residential Users	60.2	671,208	673,693	676,186	678,689	684,119	689,592
Commercial Users	60.2	18,656	18,725	18,795	18,864	19,015	19,167
Total	-	689,864	692,418	694,981	697,554	703,134	708,759

Infiltration and Inflow

Infiltration and inflow is the intrusion of groundwater or storm water into the sewer system through cracked pipes, broken and offset joints, improper connections, leaky manholes, etc. In areas with aging sewer lines and high groundwater, infiltration can actually be the largest component of flow being conveyed in the sewer. Infiltration is very difficult to measure because it varies across the service area based on climate conditions, water table levels, pipe diameter, and pipe condition. Because of the difficulty of identifying the source and quantity of infiltration, the District does not bill sewer accounts for infiltration directly. Thus, infiltration and inflow are not included in the rate model.

Peaking Characteristics

Unlike water used for outdoor irrigation, indoor water use is relatively constant year round. As a result, the calculation of sewer rates usually does not need to consider peak day demands. However, sewer flow does tend to vary significantly over the course of a single day and the peak hour demand can impose constraints on the sewer system. For a sewer system with many different user classifications (commercial, industrial etc.), peaking factors can differ significantly from user to user. However, because MID has one predominant user type (residential), the peaking factor was assumed to be the same for all connections.

Strength Characteristics

Strength characteristics of wastewater are generally used to scale the cost of treatment between different users. For example, an industrial connection may produce stronger wastewater than a residential connection, thus meriting a higher sewer rate to cover the increased treatment cost. Because there is no available historical data regarding wastewater strength per connection in the District and because the vast majority of the number of ERUs have been grouped in the same customer class, wastewater strength is assumed to be the same for all users and will therefore have no special impact on the existing rate structure. With that said, the strength category will still be included as part of the rate analysis to provide the District with information on the actual cost of service associated with strength. This may provide some value to the District if it has any individual customers in the future that merit additional consideration of strength.

CALCULATING REVENUE REQUIREMENTS

There are two methods for determining a water utility's revenue requirements. One is called the Cash Basis of revenue requirements. The other method is called the Utility Basis of revenue requirements. The revenue requirements for each approach are summarized below.

<u>Cash Basis</u>	<u>Utility Basis</u>
Operation and Maintenance Costs	Operation and Maintenance Cost
Plus: Debt Service	Plus: Depreciation
Cash-Financed Capital Outlays	Return on Investment
Taxes (if applicable)	Taxes (if applicable)
<u>Net Additions to Reserves</u>	_____
Total Requirements	Total Requirements
Less: <u>Non-Rate Revenues</u>	Less: <u>Non-Rate Revenues</u>
Equals: Net Requirements from Rates	Equals: Net Requirements from Rates

The cash basis of revenue requirements is based on the actual cash expenditures of the system. Its goal is to make sure revenues match the cash needs of the system. In public utilities, this method generally matches the budgetary expenditures for the period. It has the additional advantage of being more understandable to most ratepayers and more directly meets any debt service coverage requirements that the system might need to comply with.

The utility basis approach simulates the financial requirements of private sector companies. It ensures that revenue requirements reflect the depreciation incurred by the system, as well as a return on the investment in rate base by system owners. In the municipal utility setting, the utility basis is most often used when there is significant utility service to customers outside the

jurisdictional boundaries of the system owners. It allows the system owners (i.e., District customers) to earn a return from the investments to serve the customers outside the District.

MID does not have any significant customers outside its jurisdictional boundaries. As a result, rates in this study were developed under the cash basis only.

Impact Fee Revenue

The projected impact fee revenue is expected to increase gradually over the next six years following system growth with some increase related to redevelopment projects.

For this analysis, it has been assumed that the District's new impact fee rates, as discussed in the 2022 Impact Fee Analysis, will be increased as recommended through 2027. If the District adopts impact fees other than those recommended, the rates calculated in this report will need to be adjusted accordingly.

Table 5
Projected Impact Fee Revenue

Item	2022	2023	2024	2025	2026	2027
Projected Impact Fee Revenues	\$69,153	\$94,499	\$95,189	\$95,841	\$208,545	\$210,868

Non-Rate Revenue

The projected non-rate revenue for the District is summarized in Table 6. The projected revenue amounts are based on a 3% inflation rate and the ERU growth rates shown in Table 3. Although we recognize inflation effects on District O&M and capital costs, it would be potentially harm the District to assume non-rate revenue will increase with inflation. For the purpose of this study, inflation effects on non-rate revenue have been assumed to match the historical average. This non-rate revenue is the net income from activities not associated with sewer sales. It includes sewer rate collection penalty fees and interest, property taxes, impact fees, and other income. As shown in the table, property taxes account for the vast majority of the total non-rate revenue.

Table 6
Projected Non-Rate Revenue

Item	2022	2023	2024	2025	2026	2027	2028
Rate Finance Charges	\$20,522	\$17,000	\$17,573	\$18,165	\$18,777	\$19,491	\$20,232
Property Tax	\$1,455,000	\$1,462,000	\$1,478,377	\$1,494,937	\$1,511,683	\$1,535,114	\$1,558,908
Impact Fees	\$100,000	\$100,000	\$95,189	\$95,841	\$208,545	\$210,868	\$212,555
Interest Income	\$95,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Other Income	\$6,000	\$6,000	\$6,202	\$6,411	\$6,627	\$6,879	\$7,141
Total	\$1,720,013	\$1,638,000	\$1,650,442	\$1,668,560	\$1,798,946	\$1,825,791	\$1,852,405

District Expenditures

The projected District expenditures for the planning period are summarized in Table 7. Included in the table are the projected total costs for the three major categories of expenditures: operations and maintenance, debt service, and capital expenditures. These categories are discussed in more detail in following sections.

**Table 7
Projected Revenue Requirements**

Item	2022	2023	2024	2025	2026	2027
O&M	\$3,893,608	\$4,373,500	\$4,546,403	\$4,690,070	\$4,886,846	\$5,068,627
Debt Service	\$0	\$0	\$0	\$0	\$0	\$0
Capital Improvements	\$58,535	\$1,932,160	\$3,455,184	\$1,516,786	\$1,553,024	\$2,717,744
Total Expenditures	\$3,952,143	\$6,305,660	\$8,001,587	\$6,206,856	\$6,439,870	\$7,786,371

Operation and Maintenance Costs: The projected operation and maintenance (O&M) costs for the District were based on the District's actual historical expenses in conjunction with the budgeted amount for 2022. A detailed list of all O&M budget categories is included as part of the rate model in the Appendix. Beyond 2022, it has been assumed that most of the O&M cost categories will annually increase at an assumed inflation rate of between 5 and 10 percent added to half the connected growth rate (shown in Table 3) for the next several years before falling back to 3.0 percent to match historical averages. The treatment plant billings are anticipated to increase by 8 to 10 percent over the next several years before dropping back to the historical average of 3.0 percent (assumed inflation rate) added to the full connected growth rate. The increased rate for the treatment category is because its associated cost are more directly related to the sewage flow rate and thus more closely tied to the number of ERUs added to the sewer system.

Debt Service Costs: The District would like to avoid debts wherever possible. As a result, the District paid off its last bond (a 2013 bond) with a lump sum payment in 2016. The District is still obligated to help fund debt service on a bond for treatment plant facilities that was financed by the South Valley Water Reclamation Facility. The projected debt service costs for the District have been taken from the District's existing bond payment schedule. A detailed list of bond payments is included as part of the rate model in the Appendix.

Capital Improvement Costs: The District anticipates approximately \$11 million in capital costs over the next five years. This includes both maintenance, pipe expansion, and treatment plant projects. It is expected that most of these capital costs will be paid for from cash in the District's savings fund. In addition to the capital projects that are needed, the District would also like to construct rehabilitation and replacement projects to maintain its collection system. The District's investment goal is approximately \$1,491,000/year (2022 dollars) for pipes and manholes and approximately \$600,000/year for treatment plan investment.

Capital projects and rehabilitation investment costs and the recommended timing of their construction is also shown in Table A11 of the Appendix.

COST ALLOCATIONS

A key step in a cost-causative wastewater rate analysis is the allocation of costs to customer service characteristics. The allocation approach used in this study reflects the basic approaches recommended by WPCF, ASCE, and APWA.

Customer Service Characteristics

This approach recommends the allocation of costs into one of four cost allocation categories:

- **Volume Costs** – Volume costs refer to costs that are determined by the volume of wastewater generated in the system.

- **Capacity Costs** – Capacity costs are typically costs determined by the peak wastewater production of system users. Although peak flows are not billed for directly (in part because there is no presently installed way to monitor them), there is a component of the system that allows each customer the opportunity to intermittently discharge peak flows. As a result, each customer should be paying for their potential to discharge at peak rates into the system, even though this capacity may be rarely used. This category would include such items as the design and construction of major trunk lines since they are oversized based on peak flow rates.
- **Strength Costs** – Strength costs are those costs determined by biochemical oxygen demand (BOD) or total suspended solids (TSS) concentrations of the wastewater.
- **Customer Related Costs** – Customer related costs are those costs that are independent of the quantity or quality of wastewater generated. This category is mostly limited to administrative services such as the cost of generating and sending out bills each month.

Detailed cost divisions have been completed in the sewer rate model (see Tables A12 through A16 of the Appendix). In each case, these allocations are based on professional engineering judgment and knowledge of system operations. Table A12 provides a division by cost allocation category for O&M expenditures. Table A13 lists the cost allocations for District assets and the overall allocated percentage amounts to each division. Using those overall allocation percentages, allocations were determined for debt service, capital outlays, and all non-rate revenue in Table A15 of the Appendix.

Using the percentages assigned to each budget category, the system revenue costs are distributed among the customer service classes to produce a total revenue requirement for each customer service characteristic. Table A16 of the Appendix shows that total cost allocation for each customer class and service characteristic.

CURRENT WASTEWATER RATE STRUCTURE

Existing sewer rates for each customer class are shown in Table 8. The existing rates are based on a combined volumetric and base rate approach. Under this approach, each residential customer connected into the system is charged the same flat rate based on the assumption that every residential customer is contributing a flow equal to 1 ERU. Each commercial user is charged based on its projected indoor water use (in ERUs) multiplied by the existing rate. For example, if a commercial customer was assigned 3 ERUs as its projected flow, the monthly charge would be \$73.50 (\$24.50 x 3). It should be emphasized that the number of ERUs assigned to each account is based on indoor water use and not actual wastewater production. This is because the District does not measure wastewater production directly. District staff have previously assigned each commercial account a specified number of ERUs based on estimated indoor water use.

Table 8
Existing Monthly Sewer Rates

Customer Class	Existing Rate (per ERU)
Residential Users	\$24.50
Commercial Users	\$24.50

In general, due to the uniformity of the customers of the system, the District's existing sewer rate structure appears to be a reasonable, cost-based structure. Total projected revenues from existing District sewer rates are shown in Table 9. As shown in the table, the District will find itself in a

deficit which will increase over time if rates are not adjusted. The table indicates an annual budget shortfall ranging from nearly \$1,200,000 to \$2,900,000. Even if recommended system investment through capital expenditures are removed, the projected revenue from existing rates is still inadequate to satisfy even basic operating expenditures.

**Table 9
Projected Revenue Based on Existing Sewer Rates**

Item	2022	2023	2024	2025	2026	2027
Projected Revenue at Existing Level of Funding (Rate and Non-Rate)	\$5,150,696	\$5,081,383	\$5,106,571	\$5,137,483	\$5,295,620	\$5,350,439
Projected Revenue Requirements	\$3,952,143	\$6,305,660	\$8,001,587	\$6,206,856	\$6,439,870	\$7,786,371
Projected Difference	\$1,198,553	-\$1,224,277	-\$2,895,016	-\$1,069,373	-\$1,144,250	-\$2,435,932

RECOMMENDED FUTURE RATES

While many entities charge customers using a base rate and volume and strength charges, the District does not have a practical way to do this for their service area because of limited access to the water use data of its customers that reside in multiple municipalities (Murray City, Sandy City, and Midvale City). Based on these considerations, recommended wastewater rates will be limited to a flat monthly base charge for residential customers. The monthly base charge is the amount charged to existing users to be connected to the system, regardless of the amount of wastewater discharged. There will be no separate charges based on wastewater strength, capacity, or volume of water used unless merited by specific circumstances. Each commercial user will be charged in the same manner as the District currently charges them. The District has previously determined an equivalent ERU flow amount for each commercial account and periodically audits that flow amount. Each commercial entity will then be charged at the same residential rate multiplied by the number of ERUs assigned to each commercial entity. This will result in a generally consistent monthly rate for each commercial customer. Following this approach, the recommended wastewater rates necessary to meet projected revenue requirements for the next five years are summarized in Table 10.

**Table 10
Recommended Monthly Rates**

Customer Class	Existing	2022	2023	2024	2025	2026	2027
Residential Users	\$24.50	\$24.50	\$27.90	\$30.70	\$33.80	\$37.20	\$40.90
Commercial Users	\$24.50	\$24.50	\$27.90	\$30.70	\$33.80	\$37.20	\$40.90
Rate Increase Percentage							
Residential Users	-	0.0%	14.0%	10.0%	10.0%	10.0%	10.0%
Commercial Users	-	0.0%	14.0%	10.0%	10.0%	10.0%	10.0%

The District expressed a desire to implement an initial rate increase in 2023 large enough that the following years would require smaller rate increases. After the initial transition period to bring rates up to the recommended sustainable long-term level of funding, annual increases can be reduced to reflect the projected rate of inflation that has been seen in the industry the past few years.

RATE COMPARISON

Figure 3 shows a comparison of MID's current and proposed sewer rates with other communities in Utah. The figure displays the current average monthly sewer rate and the estimated sewer rate in 2023 for several sewer service entities. As shown in the figure, the District's current rates are relatively low compared to other cities and service districts. Even with the proposed rate increases over the next several years, MID's monthly sewer fee will still be quite low compared to other utilities.

RECOMMENDATIONS

Based on the analysis contained in this report, the following actions are recommended:

Adopt Recommended Rates: It is recommended that the District adopt the rates summarized in Table 10. These increases are needed to meet immediate operation and maintenance needs and to fund capital expenditures to meet the District's longer-term system investment goals.

Consider a Multiple Year Rate Schedule: If at all possible, it is recommended that the District adopt the full multiple year rate schedule through 2027. By adopting a multiple year rate schedule, the District can program the desired increases to the rates consistent with the results of this report.

Update This Rate Study Frequently: After the implementation of any major change to the rate structure, we would suggest that the District monitor customer responses and system revenue for a period to two to three years. A comprehensive review of this rate study should also be performed in three to five years. The projections, assumptions, and data contained in this report may need to be revised over time. For these reasons, it is prudent to update the rates to ensure they are sufficient to meet system requirements, as well as maintain cost-of-service equity in charges to customers.

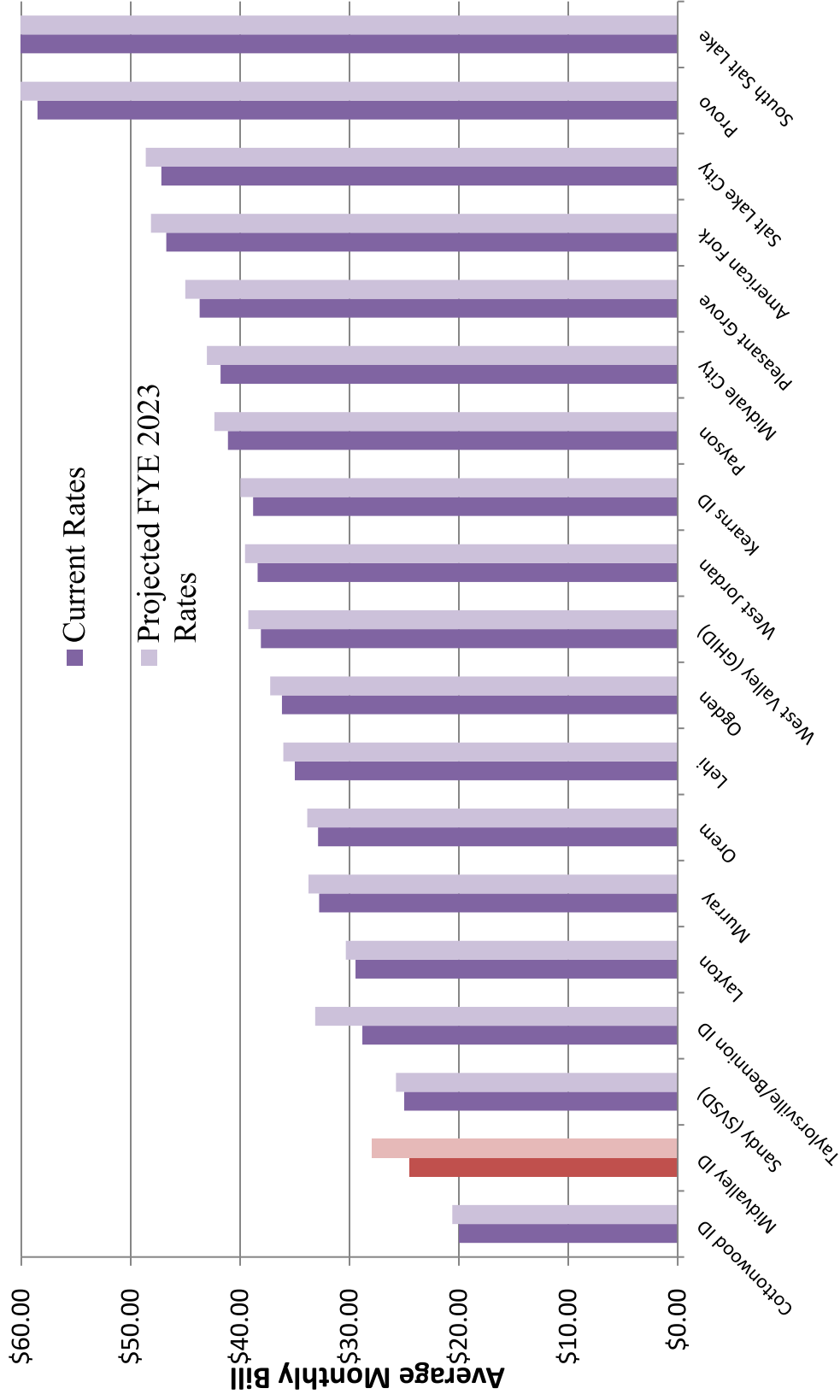


Figure 3: Comparison of Average Monthly Sewer Charges, Average Residential Customer

APPENDIX A

RATE MODEL

Table A1
Midvalley Improvement District - Sewer Rate Study
Historic Indoor Water Use
(kgal)

Customer Class	2019			2020			2021		
	Use	ERUs	Use per ERU	Use	ERUs	Use per ERU	Use	ERUs	Use per ERU
Residential Users	631,858	10,504	60.2	666,266	11,076	60.2	668,733	11,117	60.2
Commercial Users	51,071	849	60.2	18,648	310	60.2	18,588	309	60.2
Total	682,929	11,353	60.2	684,914	11,386	60.2	687,320	11,426	60.2

Table A2
Midvalley Improvement District - Sewer Rate Study
Projected ERUs

Customer Class	Number					
	2022	2023	2024	2025	2026	2027
Residential % Growth	0.37%	0.37%	0.37%	0.37%	0.80%	0.80%
Commercial % Growth	0.37%	0.37%	0.37%	0.37%	0.80%	0.80%
Combined % Growth	0.37%	0.37%	0.37%	0.37%	0.80%	0.80%
Residential Users	11,158	11,199	11,241	11,283	11,373	11,464
Commercial Users	310	311	312	314	316	319
Total	11,468	11,511	11,553	11,596	11,689	11,782

Table A3
Midvalley Improvement District - Sewer Rate Study
Projected Annual Indoor Water Use

Customer Class	Use/ERU.	Amount (kgal)					
		2022	2023	2024	2025	2026	2027
Residential Users	60.2	671,208	673,693	676,186	678,689	684,119	689,592
Commercial Users	60.2	18,656	18,725	18,795	18,864	19,015	19,167
Total		689,864	692,418	694,981	697,554	703,134	708,759

Table A4
Midvalley Improvement District - Sewer Rate Study
Projected Total Wastewater Flow

2021

Total Flow at Treatment Plant (mgd)= 1.8831

Customer Class	Amount (mgd)					
	2022	2023	2024	2025	2026	2027
Residential Users	1.84	1.85	1.85	1.86	1.87	1.89
Commercial Users	0.05	0.05	0.05	0.05	0.05	0.05
Unused	0.00	0.00	0.00	0.00	0.00	0.00
Unused	0.00	0.00	0.00	0.00	0.00	0.00
Unused	0.00	0.00	0.00	0.00	0.00	0.00
Unused	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.89	1.90	1.90	1.91	1.93	1.94

Table A5
Midvalley Improvement District - Sewer Rate Study
Peaking Factors

Customer Class	Est. Peak Hour Factor
Residential Users	1.60
Commercial Users	1.60

Table A6
Midvalley Improvement District - Sewer Rate Study
Projected Flow Peaking Characteristics

Customer Class	Estimated Peak Hour (mgd)					
	2022	2023	2024	2025	2026	2027
Residential Users	2.94	2.95	2.96	2.98	3.00	3.02
Commercial Users	0.08	0.08	0.08	0.08	0.08	0.08
Total	3.02	3.04	3.05	3.06	3.08	3.11

Table A7
Midvalley Improvement District - Sewer Rate Study
Waste Water Strength

Customer Class	BOD (mg/L)	TSS (mg/L)
Residential Users	250	250
Commercial Users	250	250
Approximate Cost Division	50%	50%

Table A8
Midvalley Improvement District - Sewer Rate Study
Projected Strength Characteristics

Customer Class	BOD (lbs/year)					
	2022	2023	2024	2025	2026	2027
Residential Users	1,399,469	1,404,649	1,409,849	1,415,068	1,426,388	1,437,799
Commercial Users	38,899	39,043	39,187	39,332	39,647	39,964
Total	1,438,368	1,443,692	1,449,036	1,454,400	1,466,035	1,477,763

Customer Class	TSS (lbs/year)					
	2022	2023	2024	2025	2026	2027
Residential Users	1,399,469	1,404,649	1,409,849	1,415,068	1,426,388	1,437,799
Commercial Users	38,899	39,043	39,187	39,332	39,647	39,964
Total	1,438,368	1,443,692	1,449,036	1,454,400	1,466,035	1,477,763

Customer Class	Weighted Average (lbs/year)					
	2022	2023	2024	2025	2026	2027
Residential Users	1,399,469	1,404,649	1,409,849	1,415,068	1,426,388	1,437,799
Commercial Users	38,899	39,043	39,187	39,332	39,647	39,964
Total	1,438,368	1,443,692	1,449,036	1,454,400	1,466,035	1,477,763

Table A9
Midvalley Improvement District - Sewer Rate Study
Impact Fee Revenue

Item	Actual 2021	Budgeted 2022	Projected 2023	Projected 2024	Projected 2025
Impact Fee (\$/ERU)	\$1,619	\$1,635	\$2,226	\$2,234	\$2,241
Impact Fee Revenue ¹	\$84,076	\$69,153	\$94,499	\$95,189	\$95,841
Total Impact Fee Revenue		\$69,153	\$94,499	\$95,189	\$95,841

¹ Calculated based on ERU growth rate and then adjusted based on projections from the District

Table A10
Midvalley Improvement District - Sewer Rate Study
Non-Rate Revenue

Assumed Inflation Rate = 3.0%

Item	Actual 2021	Budgeted 2022	Projected 2023	Projected 2024	Projected 2025
<i>Operations Non-Rate Revenue</i>					
Finance Charges and Other Income	\$11,302	20,522	\$17,000	\$17,573	\$18,165
Total Operations Non-Rate Revenue	\$11,302	\$20,522	\$17,000	\$17,573	\$18,165
<i>Non-Operations Non-Rate Revenue</i>					
Property Tax ¹	\$1,427,362	\$1,455,000	\$1,462,000	\$1,478,377	\$1,494,937
Impact Fees	\$84,076	\$100,000	\$100,000	\$95,189	\$95,841
Interest Income	(\$2,994)	\$95,000	\$50,000	\$50,000	\$50,000
Other Income	\$1,158	\$6,000	\$6,000	\$6,202	\$6,411
Gain on Disposable Assets	\$23,649	43,491	\$3,000	\$3,101	\$3,206
Total Non-Operations Non-Rate Revenue	\$1,533,251	\$1,699,491	\$1,621,000	\$1,632,869	\$1,650,395
Total Non-Rate Revenue	\$1,544,553	\$1,720,013	\$1,638,000	\$1,650,442	\$1,668,560

¹ Assumed property valuation inflation rate approximately 1.2% based on projections from the District

Table A11
Midvalley Improvement District - Sewer Rate Study
Revenue Requirements
Cash Basis

Item	Actual 2021	Budgeted 2022	Projected 2023	Projected 2024	Projected 2025
<i>Sewage Treatment Expenses</i>					
Treatment Plant Billings	\$1,147,399	\$1,405,000	\$1,545,500	\$1,674,861	\$1,815,050
Prepaid Operational Billings Amort.	\$129,756	\$181,000	\$180,000	\$180,000	\$180,000
Annual SVWRF 2008 4D Bond Payments	\$132,660	\$133,000	\$133,000	\$133,000	\$133,000
<i>General O&M</i>					
Salaries and Wages ¹ and Payroll Taxes	\$962,907	1,012,013	\$1,108,000	\$1,198,691	\$1,296,805
Employee Benefits	\$516,366	703,246	\$740,000	\$778,370	\$818,729
Repairs and Maintenance	\$18,636	\$78,000	\$79,000	\$81,516	\$84,113
Office Expenses	\$138,583	\$168,000	\$180,000	\$185,733	\$191,649
Insurance	\$48,196	\$57,000	\$57,000	\$58,815	\$60,689
Vehicle Expenses	\$51,851	57,764	310,000	\$213,111	\$66,383
Legal & Accounting Services	\$15,146	\$40,000	\$40,000	\$41,274	\$42,589
Engineering	\$0	58,585	\$1,000	\$1,032	\$1,065
Total O&M	\$3,161,500	3,893,608	\$4,373,500	\$4,546,403	\$4,690,070
<i>Debt Service</i>					
2013 Sewer Bond Payment (paid off in 2016)	\$0	\$0	\$0	\$0	\$0
Total Debt Service	\$0	\$0	\$0	\$0	\$0
<i>Expansion and Replacement</i>					
Rehabilitation and Replacement Budget	-	-	-	\$0	\$1,000,000
Master Plan Update		\$58,535			\$67,762
C1 - 7500 S between State St and 410 E				\$2,463,000	
C2 - 7200 S between State St and Ramancee Dr					
C3 - 6830 S between Railroad and State St					
C4 - State St between 7640 S and 7554 S				\$355,000	
M1 - Fairmeadows Dr, 700 E to 900 E			\$814,000		
M2 - Laser Profile & Sonar Inspection			\$84,000		
M3 - Union Woods Drive			\$750,000		
SVWRF Projects			\$284,160	\$637,184	\$449,024
Transfer to/(from) Savings Fund	\$885,284	\$1,205,534	(\$813,862)	(\$2,094,888)	\$165,092
Total Capital Outlays	\$885,284	\$1,264,069	\$1,118,298	\$1,360,296	\$1,681,878

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