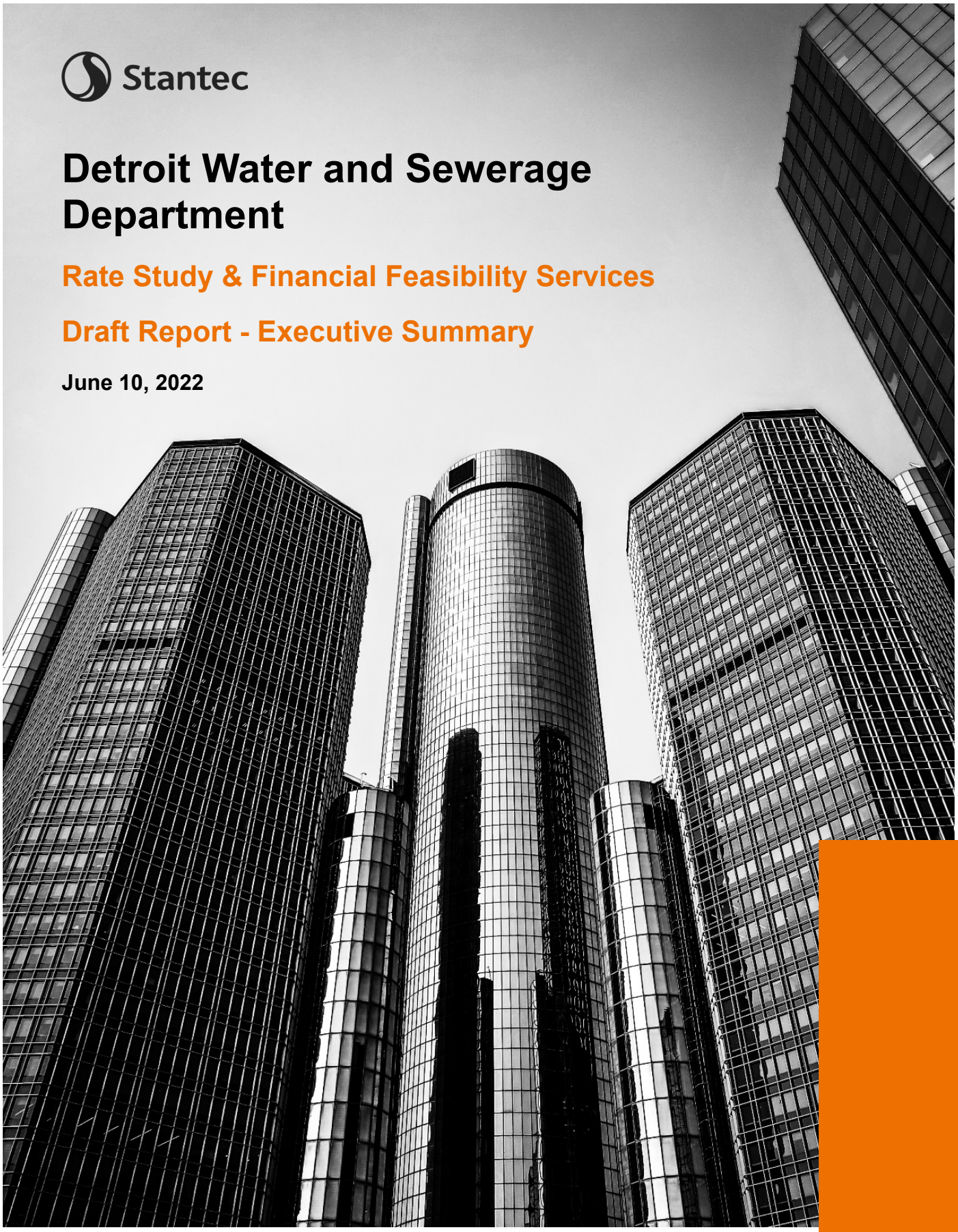
Stantec

Detroit Water and Sewerage Department

Rate Study & Financial Feasibility Services

Draft Report - Executive Summary

June 10, 2022



June 10, 2022

Mr. Istakur Rahman
Chief Financial Officer,
Water and Sewerage
Department

Re: Rate Study & Financial
Feasibility Services

Dear Mr. Rahman,

Stantec Consulting Services Inc. is pleased to present this Draft Report Executive Summary of the Rate Study & Financial Feasibility Services (Study) that we completed for the Detroit Water and Sewerage Department (DWSD). We appreciate the fine assistance provided by you and the members of DWSD staff who participated in this Study.

If you or others at DWSD have any questions, please do not hesitate to call me at (813) 204-3331, or email me at Andrew.Burnham@stantec.com. We appreciate the opportunity to be of service to DWSD and look forward to working with you again in the near future.

Sincerely,

Andrew J. Burnham
Vice President

Carol Malesky
Sr. Principal/Project Manager

Enclosure

1. EXECUTIVE SUMMARY

This executive summary outlines the background, objectives, approach, and results of the Rate Study and Financial Feasibility Services (Study) completed by Stantec Consulting Services Inc. (Stantec) for the Detroit Water and Sewerage Department (DWSD or "the Utility"). The full report describes the detailed assumptions, data sources, and methodology used in the Study.

1.1 BACKGROUND AND OBJECTIVES

DWSD provides water, wastewater, and drainage services to a customer base of approximately 230,000 accounts. DWSD is independent from the City of Detroit and is a customer of the Great Lakes Water Authority (GLWA). DWSD pays GLWA wholesale charges for water and wastewater service and GLWA pays DWSD a lease payment intended to support capital infrastructure. The Study focuses on DWSD's costs, paid for by DWSD customers through water, sewer, and drainage rates.

A formal cost-of-service study has not been performed since bifurcation of the City of Detroit's water and sewer system assets. This Study is required as part of the bifurcation agreement with GLWA, as well as by Michigan law[1] which requires municipal service providers to structure rates that adhere to proportionality and cost-of-service principles. This Study's overall goal is to develop rates for DWSD's customers that are in proportion to the cost of providing service, follow industry best practices, and are legally defensible and transparent.

The Study was performed based on the following process:

Revenue Requirements – Develop a multi-year forecast for DWSD that determines the annual revenue needed to fund operating expenses, wholesale costs, existing liabilities, and infrastructure needs. Determine appropriate funding sources for capital projects and maintain financial policies and targets.

Cost Allocation – Allocate test year revenue requirements to water and sewer systems based on cost center categories and proportional usage characteristics of each system. Allocate water revenue requirements to water system functions and customer classes based on system and use characteristics. Allocate sewer revenue requirements to wastewater and drainage based on sewer functional categories and components of sewer flow.

Rate Design – Review DWSD's existing rate structure and develop modifications, as appropriate, based on accepted industry best practices and proportional allocation of costs based on cost-of-

[1] *Bolt v City of Lansing* 1998 Michigan Supreme Court decision identified what is a valid user fee verses a tax; Headlee Amendment to the Michigan Constitution prohibits levying new taxes or raising existing taxes without voter approval.

service analysis. Evaluate customer bill impacts, affordability programs currently available to DWSD customers, and possible future affordability programs.

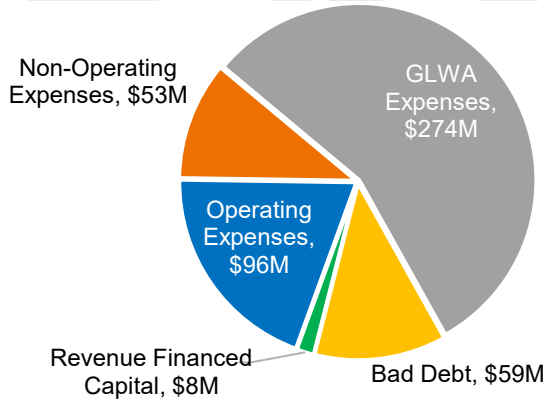
Communication – Evaluate customer impacts, perform national and local benchmarking, and present recommendations.

1.2 REVENUE REQUIREMENTS ANALYSIS

The revenue requirements analysis evaluated DWSD's current revenues and the levels of customer rate increases needed to meet projected financial requirements over the 10-year period of Fiscal Year (FY) 2022 through FY 2031. The process included a review of DWSD's operating expenses, non-operating expenses, GLWA expenses, bad debt, and capital expenses. The analysis also evaluated non-rate revenue sources of funding and established a capital funding plan based on available sources of revenue.

Through this process, financial management plans and associated recommendations for annual water, wastewater, and drainage rate revenue increases were developed to address current and projected DWSD costs. Based on the FY 2023 Preliminary Budget, GLWA expenses are more than 55 percent of the total revenue requirement, while costs funded by customer rates that DWSD can control - operating and revenue financed capital costs - represent 21 percent of the total revenue requirement. Figure 1-1 shows a summary of FY 2023 revenue requirements for the Operating Fund by expense type.

Figure 1-1: FY 2023 Revenue Requirement Summary



Stantec worked with DWSD to develop a sustainable financial management plan for the water and sewer systems that utilized available revenue sources and customer rate increases to sustain future expenditure requirements and reserve levels. Table 1-1 shows the projected amount of year-end reserve balances versus the recommended DWSD's Operating Fund target (three months of operating expenses) for FY 2022 through FY 2026.

Table 1-1: Projected Water and Sewer Operating Fund Balance ($M)

	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Water Operating Fund Balance	$32.4	$32.4	$29.7	$29.9	$31.0
Water Operating Fund Target	$21.3	$21.7	$18.4	$19.2	$19.7
Sewer Operating Fund Balance	$76.5	$76.5	$86.8	$98.9	$112.4
Sewer Operating Fund Target	$82.6	$84.0	$81.5	$84.4	$86.8

The level of projected water, wastewater, and drainage adjustments to rate revenues are shown in Table 1-2. The FY 2023 rate adjustments reflect the results of the cost allocation study to rebalance the revenue needed from each system. The total amount of additional revenue generated by the increases shown FY 2023 is 0.8%.

Table 1-2: Projected Annual Rate Revenue Increases

	FY 2023	FY 2024	FY 2025	FY 2026
Water Increase	21.2%	4.00%	4.00%	4.00%
Wastewater Increase	-13.7%	4.00%	4.00%	4.00%
Drainage Increase	1.8%	4.00%	4.00%	4.00%

1.3 COST ALLOCATION

The purpose of a cost-of-service analysis is to proportionally distribute identified revenue requirements among the various systems and types of customers served, based on accepted industry best practices. Such practices are documented by water industry publications such as the American Water Works Association's (AWWA) M1 Principles of Water, Rates, Fees, and Charges[2], the Water Environment Federation's (WEF) Manual of Practice No. 27[3], and the AWWA M22 Sizing Water Service Lines and Meters[4].

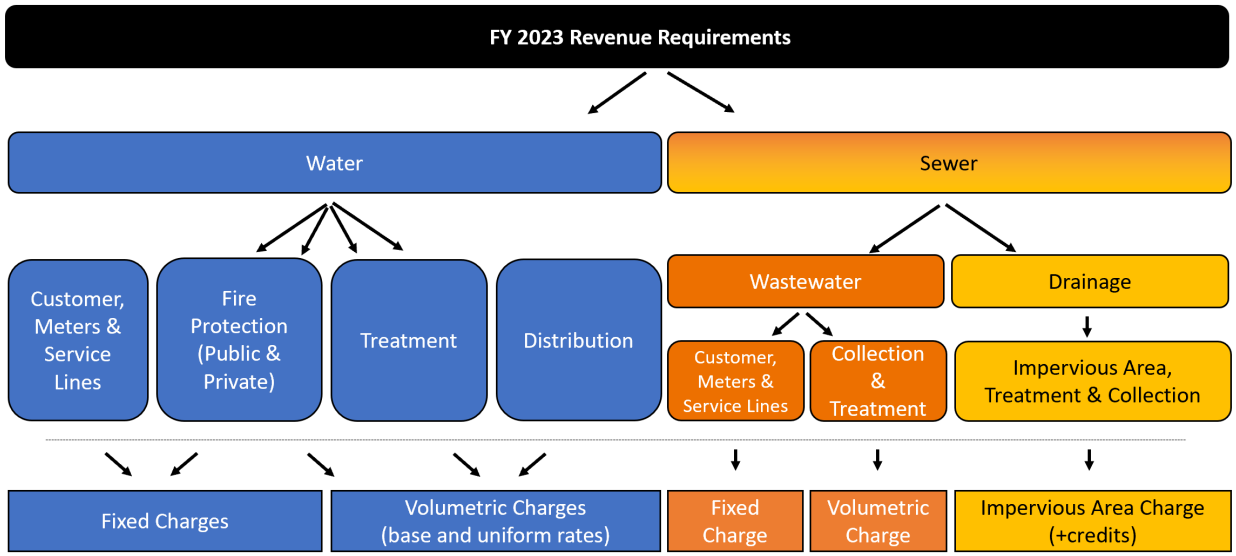
Figure 1-2 shows the cost-of-service allocation approach. FY 2023 Operating Fund revenue requirements were first allocated to water and sewer, and sewer costs were further allocated to wastewater and drainage. Water costs were then allocated to water functions and wastewater costs were allocated to wastewater functions. The bottom portion of the graphic shows how the cost allocation forms the cost basis for the water, wastewater, and drainage charges.

[2] Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, AWWA M1, Seventh Edition, 2017,

[3] Financing and Charges for Wastewater Systems, WEF Manual of Practice No. 27, 2019

[4] Sizing Water Service Lines and Meters, AWWA M22, Third Edition, 2014.

Figure 1-2: Cost Allocation Approach

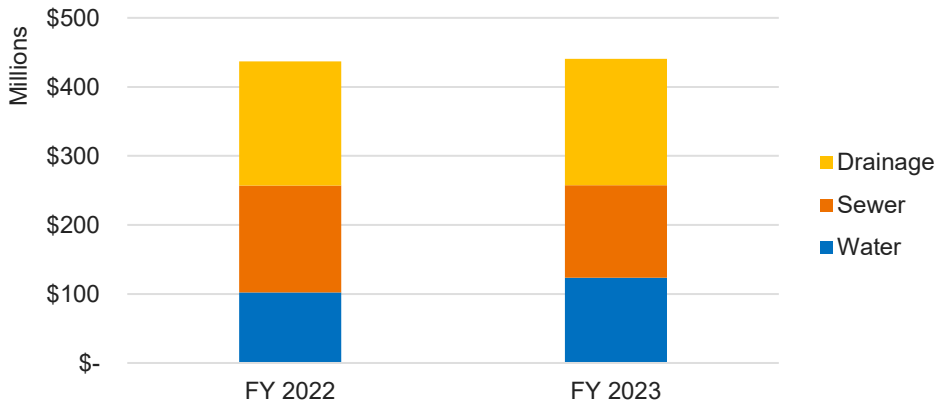


The Study followed the AWWA and WEF industry best practices by:

1. Allocating costs to water, wastewater, and drainage based on individual categories of costs and proportional use of each system.
2. Allocating water and wastewater costs to individual functions or activities (such as supply, treatment, transmission, meters/services, etc.). This step is often called "functionalization" and it links costs with the functions utilities perform to meet customer demands.
3. Allocating the cost of each water function to the appropriate cost components (such as average use, maximum day demands, peak hour demands, customer service, etc.). This links costs with the customer use characteristics that drive costs and is called the base/extra-capacity approach for cost allocation.
4. Distributing the costs of each water cost component to customer classes in accordance with the unique demand characteristics that each customer class places on the utility. This step identifies the units of service for customers based on meter size and billed volume, as well as calculated maximum day and peak hour demands.

The results of the cost allocation to water, wastewater, and drainage are depicted in Figure 1-3, showing the total revenue requirements by system in FY 2022 and FY 2023. The results demonstrate that current revenues are generally proportional to the cost-of-service. FY 2023 rate revenues will reflect the cost-of-service allocation results, which is approximately a $20 million shift from wastewater to water and a small increase in drainage costs.

Figure 1-3: Cost of Service vs. Current Revenue by System

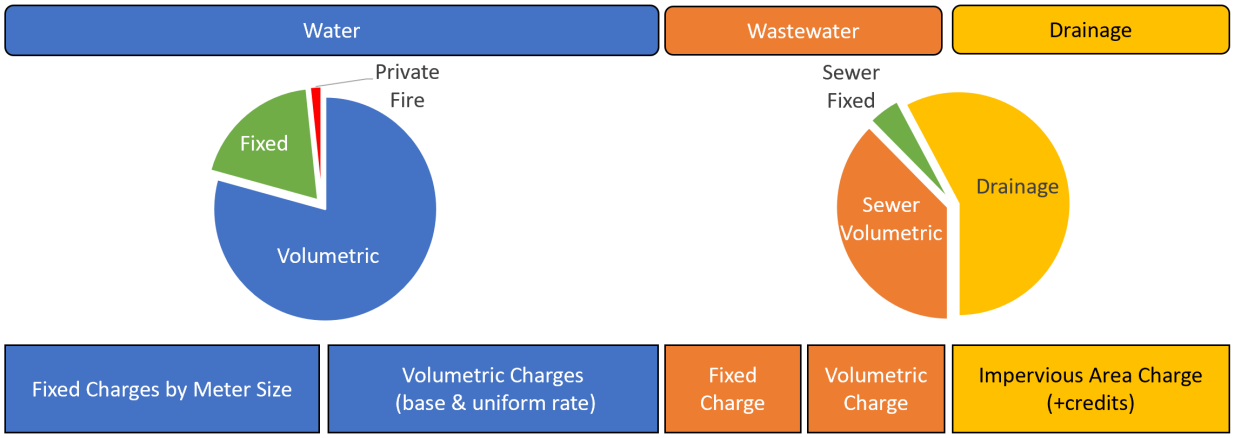


1.4 RATE DESIGN

Stantec examined DWSD's current water, wastewater, and drainage rates and developed recommended rate structure modifications that 1) proportionally recover cost of service and revenue requirements from each system and customer class, 2) conform to accepted national and local industry best practices, and 3) promote affordability.

The results of the cost allocation analysis with respect to the water, sewer, and drainage rate structures is shown in Figure 1-4. The following sub-sections describe the rate structures in more detail.

Figure 1-4: Rate Design Approach

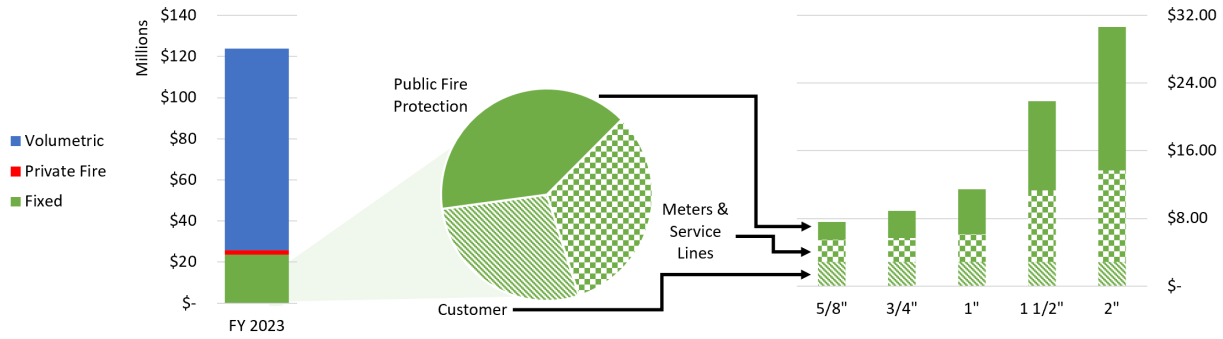


Water Fixed Charges – Water fixed charges recover three types of costs through a monthly meter charge:

- Customer service costs are allocated uniformly to all meters.
- Meters and service line costs reflect replacement cost by meter size.
- A portion of public fire protection costs (capital, debt, and GLWA expense) are scaled based on hydraulic capacity of each meter size.

Figure 1-5 shows the allocation of costs recovered in the water fixed charge and the approach for allocating each cost to the monthly meter charge for meter sizes up to 2”. Larger meter sizes are not shown; however, all meter sizes follow the same approach.

Figure 1-5: Water Fixed Charge Approach

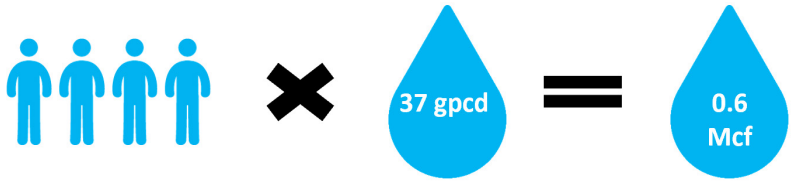


Water Volumetric Rates – Water volumetric rates recover remaining water costs in a tiered structure.

- Base tier threshold of 0.6 thousand cubic feet (Mcf) per month was calculated based on estimated indoor residential water use.[5]
- Base tier rate was calculated by dividing average day costs by total usage volume, plus Tier 1 peaking costs[6], divided by Tier 1 volume. The base tier structure applies to all customer classes for the first 0.6 Mcf of water use each month.
- New uniform tier rate for all use above 0.6 Mcf calculated based on average day costs divided by total volume, plus Tier 2 peaking costs[6], divided by Tier 2 volume.

Figure 1-6 shows the calculation for the base tier size of 0.6 Mcf per month.

Figure 1-6: Base Tier Size Analysis



The following Figure 1-7 shows the resulting volume in each tier by month, based on 2021 billing data. The chart demonstrates that there is minimal peaking in the base tier because the amount of water use stays consistent throughout the year.

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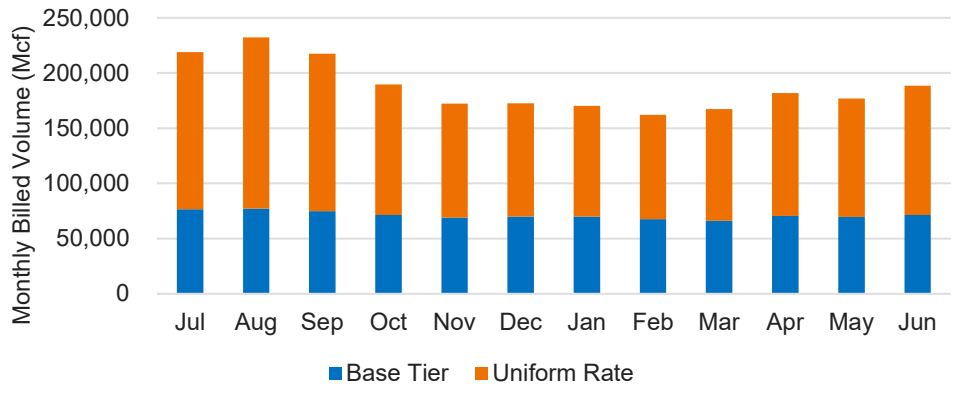
[5] Assumes four people per household and 36.7 gallons per capital per day based on *Residential End Uses of Water, Version 2*, The Water Research Foundation, 2016.

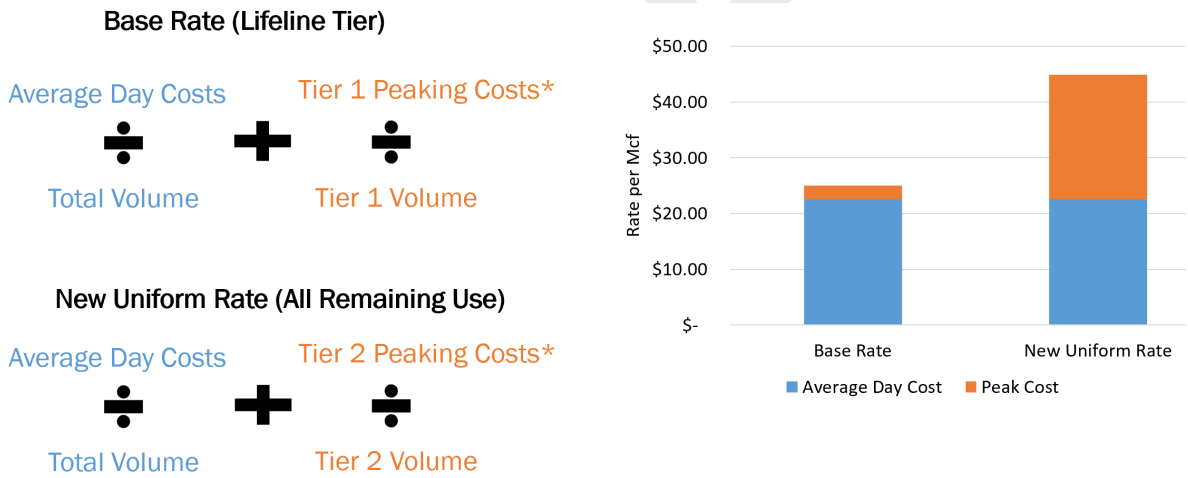
[6] Peaking cost allocation based on proportional change in monthly volume from lowest month to highest month of the test year.

Figure 1-7: Amount of Water Use that Falls in Each Tier



The following Figure 1-8 shows the calculation of the base rate and new uniform rate prices as well as the resulting rate per Mcf of the base tier and new uniform tier.

Figure 1-8: Water Volumetric Rates Pricing Analysis



*Peaking cost allocation based on proportional change in monthly volume from lowest month to highest month of the test year

Wastewater Fixed Charges and Volumetric Rates – Wastewater costs are recovered through a monthly customer charge and volumetric rate.

- Recover wastewater customer- and meter-related costs through a fixed monthly charge that applies equally to each customer bill.
- Proposed volumetric rate approach uses monthly average winter consumption (AWC) or actual water use, whichever is lower, as basis for billing the volumetric rate.
  - AWC is based on average water use from January through March.
  - AWC is applied to all customer classifications.
- Interim wastewater volumetric rate approach applies monthly cap of 1.2 Mcf on individually metered residential units.
  - Continue using billed monthly water use for all other customers.
  - Use until AWC can be implemented in billing system (FY 2024).

Water, Wastewater, and Drainage Rates

The current and proposed monthly water meter charges are shown in Table 1-3.

Table 1-3: Summary of Current and Proposed Water Meter Charges

Meter Size	Current Meter Charge (per month)	Proposed Meter Charge (per month)
5/8”	$7.86	$7.59
3/4”	$11.79	$8.88
1”	$19.65	$11.47
1.5”	$39.31	$21.88
2”	$62.89	$30.62
3”	$125.79	$96.03
4”	$196.54	$145.08
6”	$393.08	$367.74
8”	$628.93	$492.14
10"	$904.08	$923.52
12"	$1,218.55	$1,425.61
14"	$1,690.24	$2,246.35
16"	$2,240.56	$2,984.63

The current and proposed water volumetric rates are shown in Table 1-4.

Table 1-4: Summary of Current and Proposed Water Volumetric Rates

Current Tier	Current Volumetric Rate (per Mcf)	Proposed Tier	Proposed Volumetric Rate (per Mcf)
All Use	$26.60	Base Tier (<0.6 Mcf)	$25.04
		Uniform Tier (>0.6 Mcf)	$44.92

The current and proposed private fireline charges are shown in Table 1-5.

Table 1-5: Summary of Current and Proposed Private Fireline Charges

Meter Size	Current Charge (per month)	Proposed Charge (per month)
4”	$94.41	$28.84
6”	$196.69	$83.78
8”	$283.23	$178.54
10"	$456.32	$321.07
12"	$676.61	$518.62

The current and proposed wastewater service charges are shown in Table 1-6.

Table 1-6: Summary of Current and Proposed Wastewater Service Charge

	Current Charge (per bill)	Proposed Charge (per bill)
All Customers	$6.54	$6.34

The current and proposed wastewater disposal rates are shown in Table 1-7.

Table 1-7: Summary of Current and Proposed Sewer Disposal Rates

	Current Volumetric Rate (per Mcf)	Proposed Volumetric Rate (per Mcf)
All Use	$57.06	$55.40

The current and proposed drainage charges are shown in Table 1-8.

Table 1-8: Summary of Current and Proposed Drainage Charges

	Current Charge (per month per impervious acreage)	Proposed Charge (per month per impervious acreage)
All Customers	$677.00	$685.71

Customer Impacts

Table 1-9 presents a summary of the monthly impacts to single family residential customers with 5/8" meters at various levels of water use. These projections include the revenue requirement adjustments, customer class cost-of-service adjustments, and rate structure modifications recommended herein.

Table 1-9: Single Family Combined Water and Wastewater Bill Comparisons (5/8" Meter)

Water Use (Mcf)	Percentage of Bills	Current Bill	Calculated Bill	$ Change	% Change
0.0	11%	$39.79	$39.64	-$0.15	-0.4%
0.1	19%	$48.15	$47.69	-$0.46	-1.0%
0.2	31%	$56.52	$55.73	-$0.79	-1.4%
0.3	43%	$64.89	$63.78	-$1.11	-1.7%
0.4	54%	$73.25	$71.82	-$1.43	-2.0%
0.5	64%	$81.62	$79.86	-$1.76	-2.2%
0.6	72%	$89.98	$87.91	-$2.07	-2.3%
0.7	78%	$98.35	$97.94	-$0.41	-0.4%
0.8	83%	$106.72	$107.97	$1.25	1.2%
0.9	86%	$115.08	$118.00	$2.92	2.5%
1.0	89%	$123.45	$128.04	$4.59	3.7%
1.1	81%	$131.81	$138.07	$6.26	4.7%
1.2	92%	$140.18	$148.10	$7.92	5.6%
1.3	94%	$148.55	$152.59	$4.04	2.7%

Note:

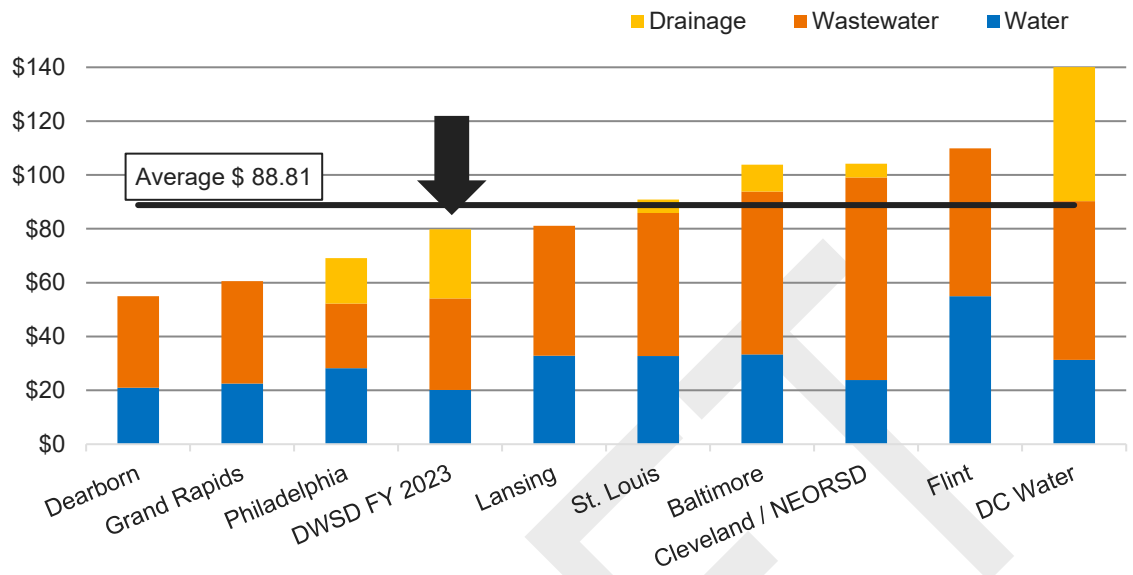
1. Bill impacts reflect water, sewer, and drainage FY 2023 revenue requirements.
2. Water rate structure change and sewer use cap of 1.2 Mcf for sewer billing change.
3. Assumes 0.05 impervious acres for drainage.

Affordability of service is important to DWSD and customer assistance to qualifying customers is currently provided through GLWA's Water Rate Assistance Program (WRAP). Residential bills in Table 1-9 do not reflect credits for the WRAP program; therefore, subscribed low-income customers currently receiving a $25 monthly credit benefit from lower monthly bills.

Outside of WRAP, Michigan law prevents the use of ratepayer dollars to fund assistance programs. DWSD, however, is continuing to review the use of outside funding sources to assist its neighbors in need.

Stantec prepared a survey of monthly residential bills for local and national peers. Figure 1-9 shows the results of this survey, comparing current water, wastewater, and drainage monthly charges to DWSD's proposed FY 2023 monthly charge for a typical residential customer. DWSD's bill of $79.86 per month is lower than the average bill of $88.81 per month.

Figure 1-9: Monthly Residential Bill Comparison

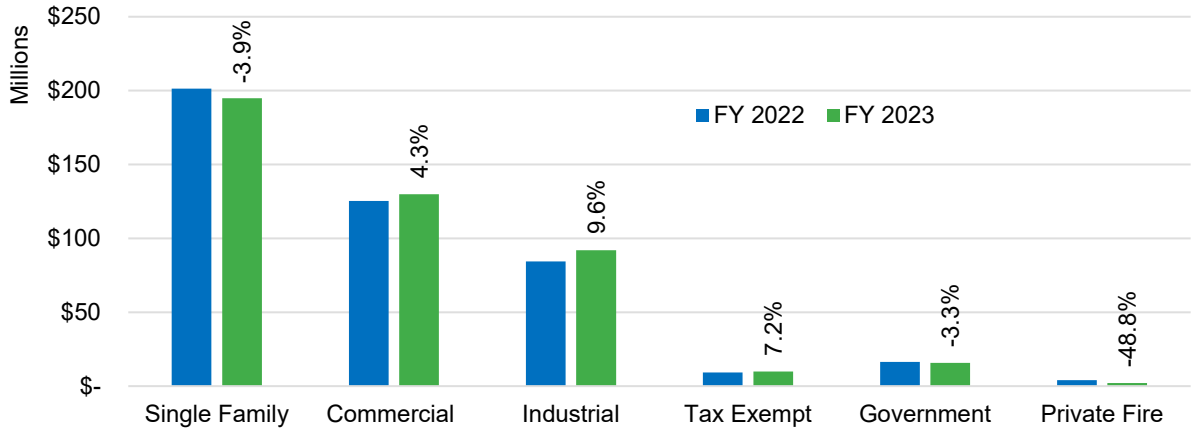


Note:

1. "DWSD FY 2023" reflects water, wastewater, and drainage FY 2023 revenue requirements and proposed rates.
2. Assumes 5/8" meter, 0.5 Mcf of water use, and 0.05 impervious acres.
3. Agencies without a drainage fee may capture costs in water/sewer charges or in non-utility sources (i.e., taxes).
4. Bills for other agencies are based on current (FY 2022) rates, and several will likely increase in FY 2023.

While only residential bill impacts are shown in Table 1-9 and Figure 1-9, non-residential customers will have varying impacts based on each customer's meter size, monthly water volume, and impervious area. Figure 1-10 shows a summary of revenue impacts for each customer classification based on FY 2023 rates and customer billing data.

Figure 1-10: FY 2023 Estimated Change in Revenue by Customer Class



1.5 SUMMARY OF STUDY FINDINGS AND RECOMMENDATIONS

This Study developed proposed rates for DWSD's customers that are in proportion to the cost of providing service, follow industry best practices, and are legally defensible and transparent. The Study's findings and recommendations are summarized below:

1. FY 2023 rate adjustments reflect results of the cost allocation study that rebalance revenue needed from each system. The total revenue increase needed from FY 2022 to FY 2023 is 0.8%.
2. FY 2023 cost allocation of revenue requirements reflects a $20 million shift in costs from wastewater to water from FY 2022 revenues.
3. Water rate structure revised to apply base rate based on essential indoor water use and allocate peaking costs to base rate and new uniform rate.
4. Wastewater rate structure revised to bill volumetric rate based on average winter consumption, calculated based on January through March water use.
5. Until average winter water usage can be incorporated into DWSD's billing system, apply a monthly sewer use cap of 1.2 Mcf for residential customers and bill actual water use for non-residential customers.
6. Continue to charge drainage rates per acre of impervious area with credits applied to customers who qualify.
7. Evaluate additional funding sources for customer assistance programs within legal limitations to minimize rate impacts on vulnerable customers.
8. Monitor revenues and expenses; update rate revenue projections and cost allocation periodically to address any fundamental shift in level of costs and cost allocation.