

STATE OF MICHIGAN  
WAYNE COUNTY CIRCUIT COURT

AJAX METAL PROCESSING, INC.,  
a Michigan corporation, individually  
and as representative of a class of  
Similarly situated persons and entities,

Case No.  
Hon.

CZ

Plaintiff,

v.

CITY OF DETROIT,  
a municipal corporation,

Defendant.

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There is no other pending or resolved civil action  
between these parties arising out of the transaction  
or occurrence alleged in this complaint.

**PLAINTIFF'S CLASS ACTION COMPLAINT AND JURY DEMAND**

Plaintiff Ajax Metal Processing, Inc. ("Ajax" or "Plaintiff"), by its attorneys, Kickham Hanley PLLC, individually and on behalf of a class of similarly situated class members, states the following for its Class Action Complaint against the Defendant City of Detroit (the "City"):

**INTRODUCTION**

1. This is an action challenging the "Inclining Block Water Rates" (the "Block Rates") imposed by the City, by and through its Water and Sewerage Department ("DWSD"), on citizens who receive treated water from the City. The Block Rates are based upon the volume of water used

by customers (as determined by a meter) and are determined by reference to how many thousand cubic feet of water (“MCF”) is used by each water customer. One MCF is roughly equal to 7480 gallons. Through use of the Block Rates, the City charges customers \$15.024 (approximately 33 cents per hundred gallons) for the first 0.6 MCF (4500 gallons) they use per month and approximately 60 cents per hundred gallons for all monthly usage in excess of 0.6 MCF (4500 gallons). The City’s use of the Block Rates results in high-volume water users, almost all of which are commercial and industrial users (the “Significant Users,” as defined below), being charged amounts far in excess of the amount the City actually incurs to service those users (the “Block Rate Overcharges”). The Block Rate Overcharges allow the City to charge residential water customers much less than the amount the City actually incurs to service those users, even though there is no meaningful per-gallon difference in the cost of servicing each class of users.

2. As applied to the Significant Users, the Block Rates, and the resulting Overcharges, are arbitrary, capricious and unreasonable and therefore are unlawful under Michigan common-law. The Block Rates also violate § 7-1202 of the Detroit City Charter, which requires all water rates to be “equitable”. The two “tiers” adopted by the City bear no reasonable relationship to a difference in costs associated with servicing the two “tiers,” but instead have been carefully crafted to move the financial burden of paying the City’s costs of providing water service off of residential customers and on to commercial and industrial users. In essence, the City’s use of the Block Rates discriminates against the disfavored Significant Users by forcing them to subsidize the City’s cost of servicing the favored residential users.

3. The City is only able to implement and profit from these Overcharges because of the unique status that municipal utilities enjoy in the State of Michigan, which allows them virtually unchecked power. Municipal utilities, like the City’s DWSD, enjoy completely unregulated monopolies over services that are essential to the health and welfare of the public.

4. Indeed, the City's water and sewer "customers" **must** buy their services and **must** pay the price set by the City's municipal monopoly – DWSD. Customers have no realistic alternative. Residents whose homes and businesses are serviced by the City's water and sewer lines are required to hook up to those facilities. As a result, people who want to use their showers, sinks, and toilets must pay the City *whatever price* the City requires for that "privilege." And if they don't "pay up" for these indispensable services, the City ultimately will take their house or business through a forced tax sale.

5. This compulsory financial relationship is virtually unheard-of in the private sector. Indeed, outside of the municipal utility monopoly context, one would be hard-pressed to identify any sellers of goods and services that: (1) provide an essential good or service that their customers must have to survive, (2) have a customer base that is required to buy from them and cannot buy from another provider, (3) have the unfettered ability to charge the captive customers any price they determine, *and* (4) have a security interest in their customer's real property in order to ensure the full payment of the charges they unilaterally impose. Plaintiff's challenge to the City's abuses of these awesome powers is set forth in detail below.

6. Plaintiffs seek an order finding and declaring that the Block Rates are unlawful and the Block Rate Overcharges must be refunded to Plaintiff and the Class. Plaintiffs also seek an injunction prohibiting the City from utilizing Block Rates in the future.

### **JURISDICTION AND VENUE**

7. Plaintiff is an industrial water customer of the City, has paid the Block Rates, and seeks to act as a class representative for all similarly situated persons. Plaintiff is a "Significant User," which definition includes all City water customers who/which per their water meters receive in excess of 2 MCF of treated water per month from the City. As used herein, the definition of "Significant User" is intended to include all water customers who/which, because of their level of

water usage, pay more under the City's Block Rate structure than they would pay under a fair and equitable rate structure. This definition may be revised as more information and data becomes available. In this Complaint, Plaintiff exclusively uses the term "Significant User" as a defined term in accordance with the foregoing definition, and not in any other sense or in accordance with any other definition.

8. Defendant City of Detroit (the "City") is a municipality located in Wayne County, Michigan. DWSD is a department of the City which, among other things, provides treated water to the inhabitants of the City.

9. Venue and jurisdiction are proper with this Court because all parties are present here and the actions which give rise to Plaintiff's claims occurred in this County.

#### **GENERAL ALLEGATIONS CONCERNING THE BLOCK RATES**

10. The City, through its Board of Water Commissioners, annually establishes the water rates (the "Water Rates") and associated charges (the "Water Charges"), including but not limited to the Block Rates. In establishing the Water Rates and Charges, the City is guided by the American Water Works Association "Principles of Water Rates, Fees and Charges, Manual of Water Supply Practices M1" (the "M1 Manual").

11. The first step in establishing Water Rates and Charges is to determine the total revenue requirement (the "Revenue Requirement") associated with the municipality's water supply system (i.e., the revenues necessary to cover the costs of the entire system). The Revenue Requirement is a summation of the operation, maintenance and capital costs that a utility must recover during the time period for which the rates will be in place.

12. There are two generally accepted approaches for establishing a utility's revenue requirements: the cash-needs approach and the utility-basis approach. During the time period at

issue in this case, the City has utilized the cash-needs approach to determine the Revenue Requirement.

13. The City, through its consultant, Stantec Consulting Services, Inc. (“Stantec”), determined that, for the time period from July 1, 2022 through July 1, 2023, the Revenue Requirement for the City’s water supply system was \$123,766,383.<sup>1</sup>

14. The second step in establishing Water Rates and Charges is to perform a “cost-of-service” analysis. The purpose of a cost-of-service analysis is to equitably distribute the Revenue Requirement between the various customer classes of service served by the utility. The cost-of-service analysis determines what cost differences, if any, exist between serving the various customer classes of service.

15. The cost-of-service process includes the following steps: (a) identification of annual revenue requirements by function or activity (including source of supply, pumping, treatment, etc.) and (2) allocation of these functional costs to appropriate cost components (including those related to annual usage, peak demands, customer meters and bills, and direct fire protection).

16. There are two generally accepted methodologies for conducting the cost-of-service analysis for a water utility. They are called the “base-extra capacity” methodology and the “commodity-demand” methodology. The functionalization, allocation, and distribution process of the base-extra capacity and commodity-demand methodologies are generally considered fair and equitable because both approaches result in the Revenue Requirement being distributed to each class in proportion to each class’s contribution to the system components.

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<sup>1</sup> This Revenue Requirement impermissibly included \$12,766,714 in “bad debt expense.” This amount represented amounts the City expected to bill to water customers but that would not be paid. The result of the inclusion of the “bad debt expense” in the Water Rates and Charges is that paying water customers collectively pay an additional \$12,766,714 per year to subsidize water

17. The City uses the “base-extra capacity” methodology to establish its Water Rates and Charges. Using the base-extra capacity method, costs are usually separated into four primary cost components: (a) base costs, (b) extra capacity costs, (3) customer costs and (4) fire protection costs.

18. “Base” costs are costs that tend to vary with the total quantity of water used plus those operating and maintenance expenses and capital costs associated with service to customers under average load conditions, without the elements of cost incurred to meet water-use variations and resulting peaks in demand.

19. “Extra capacity” costs are costs associated with meeting peak demand rate of use requirements in excess of average (base) use and include operating and maintenance expenses and capital costs for system capacity beyond that required for average rate of use. In the base-extra capacity method, costs must be carefully separated between base costs and extra capacity costs.

20. “Customer” costs comprise those costs associated with serving customers, irrespective of the amount or rate of water use. They include, but are not limited to, meter reading, billing, customer accounting, customer service, and collection expenses, as well as maintenance and capital costs related to meters and services.

21. “Direct fire protection” costs are those costs that apply solely to the fire protection function of the water system. Usually, such costs are simply those directly related to public fire hydrants and related branch mains and valves.

22. The third and final step in determining Water Rates and Charges is to conduct a rate-design analysis. This analysis determines how to recover the appropriate level of costs from each customer class of service. There are different rate structures that may be used to collect the appropriate level of revenues from each customer class of service.

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customer who don't pay their bills. The Significant Users pay a disproportionate portion of this

23. Prior to August 2022, the City’s water rate structure employed a combination of fixed monthly charges and “volumetric” charges. Fixed charges to each customer may vary depending upon the presumed usage characteristics (e.g., the size of a customer’s water meter) but do not depend upon the actual amount of water used by that customer during the billing period. Volumetric charges **are** based upon the total volume of water used by each user during a billing period. Historically, the vast majority of the total Revenue Requirement for the City’s water system was recovered through volumetric charges.

24. Prior to August 2022, the City’s volumetric water rates were **uniform**. “A uniform, uniform-volume, or uniform-commodity rate is a constant unit price for all metered volumetric units of water consumed on a year-round basis.” M1 Manual at p. 109. In other words, a customer who used 100,000 gallons of water per month paid the same amount **per gallon** as a customer who used 10,000 gallons per month. “Uniform rates are usually considered equitable because all customers pay the same unit price for general water service. Uniform rates also might be perceived as equitable during periods of rising costs. ... With uniform rates across all customer classes, the appearance of large-volume customers subsidizing small-volume customers, or vice versa, is avoided.” *Id* at p. 111.

25. Beginning in August 2022, the City implemented the Block Rates. “Increasing block rates (also known as ascending, inclining, inverted, or tiered block rates) charge increasing volumetric rates for increasing consumption. Increasing block rates require metering and defining consumption blocks over which rates increase. Increasing block rates should usually be designed by customer classes (i.e., groups with similar usage patterns).” M1 Manual at p. 123. Under an increasing block rate structure, each customer’s **per gallon** cost of water can be different based upon the total volume of water consumed by each customer.

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“bad debt expense,” which adds to the total amount of the Block Rate Overcharges.

26. “Increasing block rates are not a one-size-fits-all solution. Unless used with a small, highly homogeneous customer base, system-wide application of a single increasing block rate structure is likely to result in cost-of-service inequities, especially to commercial and industrial customers with relatively uniform consumption patterns (low peak demands but high total usage). These larger-volume customers may not impose costs on a water system proportional to the unit costs implied by increasing block rates. ... A single system-wide increasing block rate design applied to a customer base with diverse consumption patterns is more difficult to justify on a cost-of-service basis than increasing block rates designed for specific customer classes within which there are relatively homogeneous consumption patterns.” *Id.* at p. 124. “As with any rate design, overly simple or poorly designed increasing block rate structures run the risk of being inequitable.” *Id.* at p. 125.

27. Prior to implementing the Block Rates in August 2022, the City engaged Stantec to conduct a “Rate Study” to assist the City in establishing its Water Rates and Charges for the fiscal year ending June 30, 2023 (the “Stantec Rate Study”). Excerpts from the Stantec Rate Study are attached hereto as Exhibit A. In the Rate Study, Stantec purported to apply the methods and principles set forth in the M1 Manual to recommend Water Rates and Water Charges. The City expressly adopted the recommendations in the Stantec Rate Study in establishing the Water Rates and Charges that the City imposed beginning on August 1, 2022. For purposes of this Complaint, Stantec was an agent of the City and therefore the statements and admissions of Stantec are the statements and admission of the City. *See, e.g.*, MRE 801(d)(2).

28. The Stantec Rate Study sets a base rate for each user of \$25.04 per MCF for the first 0.6 MCF per month (4,488 gallons) and \$44.92 per MCF for all water use above 0.6 MCF per month. The stated rationale for the inclining block rate structure is to “reflect a proportionally

greater allocation of costs to water users who impose increased burden on the system due to higher demands.” Stantec Rate Study at p. 9.

29. Stantec stated that “[t]he water system incurs additional costs to meet peak demands; therefore, allocating peak costs to tiers in this way shifts peak costs to the customers who contribute to increasing peak demands.” *Id.* at p. 10. In other words, the higher tier in the rate structure should only cover the incremental costs associated with servicing “peak demands.”

30. The “base-extra capacity” approach used by Stantec has three primary cost components: Base, Max Day and Max Hour. The Base cost component is intended to cover “costs that would be incurred in supplying water at a perfect load factor (i.e., at a continuous, uniform rate), without costs incurred in providing extra plant capacity for variation in the rate of use beyond a uniform rate.” M1 Manual at p. 81. The Max Day and Max Hour cost components are “extra capacity costs” “incurred in providing facilities to furnish water at varying rates above the average.” *Id.* According to Stantec, “this links costs with the customer usage and service characteristics that drive costs.” Stantec Rate Study at p. 7.

31. Basically, Stantec concedes that the first tier of the volumetric Water Rates and Charges should cover Base costs and the second tier of the structure should cover Max Day and Max Hour costs.

32. Here is where Stantec and the City go awry: Stantec’s Rate Study (p. 99) actually determines the Base, Max Day and Max Hour costs as follows:

Base: \$60,438,125  
Max Day: \$27,372,918  
Max Hour: \$24,119,965

33. Stantec allocates over \$10 million of the Max Day and Max Hour costs to charges that are outside the volumetric rates. Thus, the rationale underlying Stantec’s own Rate Study dictates that of the \$98,115,778 water Revenue Requirement to be recovered through the Tier One

and Tier Two volumetric rates, \$60,438,125 should be recovered by its Tier One Base rate and \$37,677,653 should be recovered by the Tier Two rate. *Id.* at pp. 99 and 112.

34. The City's actual Water Rate structure grossly over-allocates the water system costs to Tier Two. This is why:

35. Stantec's rate design (Rate Study at p. 112) assumes that the Tier One volume will be 854,602 MCF. At \$25.04 per MCF, Stantec determined that the Tier One rates will generate \$21,399,234 per year.

36. Stantec's rate design (Rate Study at p. 112) further assumes that the Tier Two volume will be 1,733,183 MCF. At \$44.92 per MCF, Stantec determined that the Tier Two rates will generate \$77,854,580 per year.

37. So, even if one accepts Stantec's overall water Revenue Requirement, Stantec has designed Tier One rates that are designed to generate revenues of only \$21,399,234 to cover Base costs that it determined were \$60,438,125, and further has designed Tier Two rates to generate revenues of \$77,854,580 to cover Max Day and Max Hour costs that it determined were just \$37,677,653.

38. Worse, the Stantec Rate Study makes basic computational errors which further increase the Block Rate Overcharges.

39. A vital component of the Stantec Rate Study is to determine the "cut-off" between Tier One and Tier Two. That requires apportioning between Tier One and Tier Two the total volume of water Stantec estimated would be used annually by all users in the City (2,558,080 MCF). According to the Stantec Rate Study, all water customers (residential and nonresidential) get the benefit of the Tier One usage threshold. *See* Exhibit A at p. 9 ("The base tier structure applies to **all customer classes** for the first 0.6 Mcf of water use each month") (emphasis added). So, to determine the total annual volumes associated with Tier One, one must multiply Stantec's assumed

Tier One per-customer monthly usage (0.6 mcf per month) by the total number of water customers, and then annualize it by multiplying it by 12.

40. Unfortunately, Stantec's Tier One volume estimate is based upon its mistaken and inexplicable assumption that there are only **118,000** water customers in the City. As a result, Stantec's Tier One volume estimate assumes only **854,602** mcf of usage in Tier One (118,000 x 0.6 mcf x 12 months).

41. Elsewhere in the Stantec Rate Study, however, Stantec acknowledges that there are at least **191,647** water customers in the City. *See* Exhibit A at p. 111. Stantec's basic computational error results in a gross understatement of the water use that should fall within Tier One and thereby increases the Block Rate Overcharges to the Significant Users by misallocating additional volumes to Tier Two. By its own calculations, Stantec should have allocated **1,379,858 MCF** to Tier One (191,647 x 0.6 mcf per month x 12 months = 1,379,858 mcf in Tier One).

42. Inclining block rate structures like the City's Block Rates are not fair and equitable unless the tiers correspond to the difference in the City's cost of providing service for each tier. *Southern Natural Gas Co. v. FERC*, 877 F.2d 1066 (D.C. Cir. 1989). In other words, the difference in Rates between Tier One and Tier Two must be "cost-justified." *Id.*, 877 F.2d at 1073. *See also Capistrano Taxpayers Ass'n, Inc. v. City of San Juan Capistrano*, 235 Cal. App. 4<sup>th</sup> 1493, 186 Cal. Rptr. 362 (Cal. 4<sup>th</sup> Dist. 2015) (holding that inclining block rate structures must reflect the difference in costs associated with servicing each tier).

43. The City's Block Rate structure is not fair, equitable or reasonable because the Tiers do not reflect a difference in cost associated with providing water service to each Tier. Stated simply, the difference in Rates between Tier One and Tier Two is not cost-justified.

44. As predicted by the M1 Manual, the City's "system-wide application of a single increasing block rate structure" has resulted in "cost-of-service inequities, especially to commercial

and industrial customers with relatively uniform consumption patterns (low peak demands but high total usage).”

45. Remarkably, Stantec itself has previously recognized that the kind of Block Rate structure it devised for the City here is not fair or equitable. The Stantec Rate Study that became the basis for the City’s Block Rate structure was authored by Andrew Burnham of Stantec. A few years ago, Burnham did a Cost-of-Service Study for the City of Ann Arbor, Michigan. *See* Exhibit B hereto (excerpts). In that study, Burnham recommended an inclining block rate structure just for the residential class, and a uniform rate structure for all other classes, including non-residential users. This is what he said to justify the distinct rate structures:

**“As a class, it is well established and supported by data (as is the case here) that Residential customers use water differently than Non-Residential, Multifamily, and Water Only customers. However, for customers within a class, such as different types of Non-Residential customers, there needs to be a rationale, data and a system for developing a structure that is fair and based on the cost to serve. Within the Non-Residential class, there is a wide variety of business types with different levels of water usage requirements and metering configurations, such that charging a tiered volumetric rate for this customer class would not be fair.**

For example, a small office in the City may use about 20 CCF throughout the year, and a restaurant with the same square footage may use 100 CCF throughout the year. If a second tier rate were set at 50 CCF, that would be unfair to the restaurant to charge them more for 50 CCFs, even though they are not contributing to the cost that is driving the Non-Residential peak to the system. **Because Non-Residential customers have no standard activity to determine a fair way to allocate the cost of service in the pricing structure, a flat rate is the most equitable in the absence of the data, system and resources to establish and maintain individualized customer-specific tiers.**” [Exhibit B hereto (emphasis added)].

46. As Stantec recognized in its Ann Arbor cost-of-service study, the Block Rates Stantec later inexplicably devised for water customers in the City (which disproportionately impact Significant Users), are not fair because there is no “rationale, data or a system for developing a structure that is fair based on the cost to serve.” Within the class of non-residential City water customers, “there is a wide variety of business types with different levels of water usage

requirements and metering configurations, such that charging a tiered volumetric rate for this customer class would not be fair.”

47. Here is the fatal flaw in the Stantec Rate Study: The Rate Study wrongly assumes that the significantly higher Tier Two Rate is justified because Significant Users cause or contribute to “peak” usage which drive the “Max Day” and “Max Hour” costs of the water system. To the contrary, however, Stantec’s own Rate Study (and its prior admissions in Ann Arbor) confirm that high but relatively **consistent** water use by Significant Users does not drive system “peaking” costs. Therefore, high usage alone does not justify imposing Tier Two Rates on Plaintiff and the Class.

48. And it gets worse: Documents authored and/or adopted by the City confirm that the City devised the Block Rates not to reflect real differences in the “cost to serve” Significant Users vis-à-vis other users, but rather to move substantial amounts of the overall Revenue Requirement of the water system off of the residential class and onto commercial and industrial customers.

49. This effort started no later than 2016. In that year, the City convened a “Blue Ribbon Panel on Affordability” (the “Panel”), which was designed to explore the “options that may be implemented by DWSD to address low-income customer needs.” See Exhibit C hereto (excerpts), Cover Letter.

50. The Panel actively questioned whether Water Rates that were based upon income were legal, given the tax limitations imposed by *Bolt v. City of Lansing*, 459 Mich. 152 (1998).

51. Given that expressly basing Rates on wealth and income was likely illegal, the Panel sought a proxy for wealth and income – *i.e.*, a classification that would come close to achieving the same result but was not reliant upon explicit classifications based on wealth and income. The Panel ultimately settled on Block Rates.

52. The Panel stated as follows:

Among the options considered, increasing-block rate designs for both water and sewer services would be an effective pricing structure for addressing water affordability issues in Detroit. By contrast, **an income-indexed rate component**, such as that included in the Water Affordability Program initially proposed to DWSD in 2005, **would be more susceptible to legal challenge**, more difficult to implement and administer, and less broadly based due to the income-qualification of this rate design. [Exhibit C, p. 1 (emphasis added)]

53. To further justify its recommended use of Block Rates to further its goal of “income-based affordability,” the Panel relied upon the following statement of Panel member Roger Colton:

A move to an increasing block rate, **designed with affordability as one of its explicit objectives**, is a reasonable and appropriate “compromise” between those who argue for an explicit income-based affordability program and those who argue that any such explicit income-based affordability program is contrary to law. [Exhibit C at p. 22 (emphasis added)].

54. Nonetheless, even the Panel recognized that the differentiated Block Rates had to be based upon the City’s costs. The Panel stated that the “increasing-block rate structures” should “be based on cost-of-service principles.” *Id.* at p. 2. And like Stantec, the Panel acknowledged that “[r]ate blocks appropriate for residential use are unlikely to be appropriate for industrial accounts.” *Id.* at p. 17, n. 24.

55. The Block Rates ultimately devised by Stantec are not based upon “cost-of-service principles.” Moreover, because the Block Rates are applied to **all** customer classes, the Block Rates do not recognize the unique usage characteristics of each customer class.

56. The Significant Users have no choice but to use water provided by the City and to pay the Rates and Charges imposed by the City. “The City, through the Board of Water Commissioners, shall have as security for the collection of any water rates, assessments, or charges due or to become due, for the use or consumption of water supplied to any building or to any premises, lot, piece or parcel of land, a lien upon such building and upon any premises, lot, piece or parcel of land upon which such building shall be situated or to which such water is supplied. Such lien shall become effective immediately upon the distribution of the water to the premises or

property supplied.” City Ordinance Section 48-1-41. “All water charges shall be assessed against the premises supplied and shall be a lien against the same. The official records of the Water and Sewerage Department shall constitute notice of the pendency of such lien. Such lien shall have priority over all other liens, except taxes or special assessments, whether or not such other liens accrued or were recorded prior to the accrual of such water lien.” City Ordinance Section 48-1-42.

57. The City, through the Board of Water Commissioners and its officers, agents or employees, may discontinue water service to any building or any premises, lot or any parcel of land upon which any water rates, assessments, or charges referred to in this division are delinquent and against which the lien referred to in this division shall have accrued, or may institute suit for collection of such water rates, assessments or charges in any court of competent jurisdiction. No discontinuance of service or any attempt to collect such water rates, assessments, or charges by any process shall in any way invalidate or waive the lien upon the premises. City Ordinance Section 48-1-44. “To enforce collection of water rates, assessments, and charges referred to in this division by sale of the house, building, lot or piece or parcel of land, the City, acting by and through the Board of Water Commissioners, its officers, agents and employees, may proceed to sell such building, lot, piece or parcel of land when any such water rates, assessments, or charges are not paid, provided, that notice of sale of the premises shall be published for three successive weeks in a newspaper of general circulation in the City and County. ...” City Ordinance Section 48-1-45.

### **CLASS ALLEGATIONS**

58. Plaintiff brings this action as a class action, pursuant to MCR 3.501, individually and on behalf of a proposed class consisting of all Significant Users who/which have incurred or paid Water Rates and Charges since August 1, 2022.

59. The members of the Class are so numerous that joinder of all members is

impracticable.

60. Plaintiff's claims are typical of the claims of members of the Class. Plaintiff is a member of the Class it seeks to represent, and Plaintiff was injured by the same wrongful conduct that injured the other members of the Class.

61. The City has acted wrongfully in the same basic manner as to the entire class.

62. There are questions of law and fact common to all Class Members that predominate over any questions, which, if they exist, affect only individual Class Members, including:

- a. Whether the Block Rate Overcharges imposed by the City are arbitrary, capricious and/or unreasonable under common-law principles;
- b. Whether the Block Rate Overcharges imposed by the City are "equitable," as required by the City's Charter;
- c. Whether the City has been unjustly enriched by collecting the PFL Overcharges in violation of its own Charter and the common law;

63. Plaintiff will fairly and adequately protect the interests of the Class, and Plaintiff has no interests antagonistic to those of the Class. Plaintiff is committed to the vigorous prosecution of this action, and has retained competent and experienced counsel to prosecute this action.

64. A class action is superior to all other available methods for the fair and efficient adjudication of this controversy since joinder of all members is impracticable. The prosecution of separate actions would create a risk of inconsistent or varying adjudications. Furthermore, the prosecution of separate actions would substantially impair and impede the ability of individual class members to protect their interests. In addition, since individual refunds may be relatively small for most members of the class, the burden and expense of prosecuting litigation of this nature makes it unlikely that members of the class would prosecute individual actions. Plaintiff anticipates no difficulty in the management of this action as a class action.

**COUNT I**  
**ASSUMPSIT – MONEY HAD AND RECEIVED**  
**CHARTER VIOLATION**

65. Plaintiff incorporates Paragraphs 1 through 64 of this Complaint, as if fully set forth herein.

66. As a direct and proximate result of the City's improper conduct, the City has collected millions of dollars to which it is not entitled. By paying the Block Rate Overcharges, Plaintiff and the Class have conferred a benefit upon the City.

67. The City has been unjustly enriched because it received Block Rate Overcharges to which it was not entitled, and it would be unfair for the City to retain the Block Rate Overcharges under the circumstances.

68. The Detroit City Charter, § 7-1202, adopted by the City's voters in 2012, specifically provides that the City must "establish equitable rates to be paid" for all water supply, drainage, and sewer services. This is a limitation on Water Rates imposed by the citizens of the City, which is binding on the City.

69. Pursuant to Article 7, Sec. 22 of the 1963 Constitution, "[u]nder general laws the *electors* of each city and village shall have the power and authority to frame, adopt and amend its charter . . . ." (Emphasis added.) Under Article 7, Sec. 22, "the electors of cities are vested with control over their cities' charters," ..., and "the electorate of a city is entitled to the final word as to whether a revised charter is to be adopted." *Sheffield v. Detroit City Clerk*, 508 Mich. 851, 853, 962 N.W.2d 157 (2021).

70. A city may not take an action "that contradicts limitations expressly provided in the city's charter. The charter of a city stands as its 'constitution'; it is the definition of a city's rights and obligations as a municipal entity, so far as they are not otherwise legally granted or imposed." *Bivens v. City of Grand Rapids*, 443 Mich. 391, 399, 505 N.W.2d 239 (1994).

71. The City has violated its Charter by failing to impose “equitable” Rates.

72. The term “equitable” means “[just], fair, and right, **in consideration of the facts and circumstances of the individual case.**” *Attorney General v. Ankersen*, 148 Mich. App. 524, 553, 385 N.W.2d 658 (1986) (quoting Black’s Law Dictionary, 4th ed.) (emphasis added). Water Rates can be “inequitable” in violation of the City’s Charter even if they are not “arbitrary, capricious or unreasonable” under common-law principles.

73. The City has admitted, through its agent Stantec, that the Block Rates are not “fair” and therefore not “equitable” for the reasons set forth above.

74. A claim to recover amounts paid to a governmental unit in excess of the amount allowed under law is properly filed as an equitable action in assumpsit for money had and received.

75. By virtue of the City’s inclusion of the Block Rate Overcharges in the Water Rates, the City has collected amounts in excess of the amounts it was legally entitled to collect. Therefore, Plaintiff is entitled to maintain an equitable action of assumpsit to recover back the amount of the illegal exaction. *See, e.g., Bond v. Public Schools of Ann Arbor*, 383 Mich. 693, 704, 178 N.W.2d 484 (1970).

WHEREFORE, the City should be required to disgorge the revenues attributable to the Block Rate Overcharges imposed or collected by the City between August 1, 2022 and the date of the filing of this action, and during the pendency of this action, and refund all Block Rate Overcharges it has collected to Plaintiff and the Class. In addition, the Court should permanently enjoin the City from collecting any past Block Rate Overcharges and from imposing or collecting Block Rates in the future which exceed the City’s actual costs of providing treated water to Plaintiff and the Class.

**COUNT II**  
**UNJUST ENRICHMENT—CHARTER VIOLATION**

76. Plaintiff incorporates Paragraphs 1 through 64 of this Complaint, as if fully set forth herein.

77. As a direct and proximate result of the City's improper conduct, the City has collected millions of dollars to which it is not entitled. By paying the Block Rate Overcharges, Plaintiff and the Class have conferred a benefit upon the City.

78. The City has been unjustly enriched because it received Block Rate Overcharges to which it was not entitled, and it would be unfair for the City to retain the Block Rate Overcharges under the circumstances.

79. The Detroit City Charter, § 7-1202, adopted by the City's voters in 2012, specifically provides that the City must "establish equitable rates to be paid" for all water supply, drainage, and sewer services. This is a limitation on Water Rates imposed by the citizens of the City, which is binding on the City.

80. Pursuant to Article 7, Sec. 22 of the 1963 Constitution, "[u]nder general laws the *electors* of each city and village shall have the power and authority to frame, adopt and amend its charter . . . ." (Emphasis added.) Under Article 7, Sec. 22, "the electors of cities are vested with control over their cities' charters," ..., and "the electorate of a city is entitled to the final word as to whether a revised charter is to be adopted." *Sheffield v. Detroit City Clerk*, 508 Mich. 851, 853, 962 N.W.2d 157 (2021).

81. A city may not take an action "that contradicts limitations expressly provided in the city's charter. The charter of a city stands as its 'constitution'; it is the definition of a city's rights and obligations as a municipal entity, so far as they are not otherwise legally granted or imposed." *Bivens v. City of Grand Rapids*, 443 Mich. 391, 399, 505 N.W.2d 239 (1994).

82. The City has violated its Charter by failing to impose "equitable" Rates.

83. The term “equitable” means “[j]ust, fair, and right, **in consideration of the facts and circumstances of the individual case**”. *Attorney General v. Ankersen*, 148 Mich. App. 524, 553, 385 N.W.2d 658 (1986) (quoting Black’s Law Dictionary, 4th ed.) (emphasis added). Water Rates can be “inequitable” in violation of the City’s Charter even if they are not “arbitrary, capricious or unreasonable” under common-law principles.

84. The City has admitted, through its agent Stantec, that the Block Rates are not “fair” and therefore not “equitable” for the reasons set forth above.

WHEREFORE, the City should be required to disgorge the revenues attributable to the Block Rate Overcharges imposed or collected by the City between August 1, 2022 and the date of the filing of this action, and during the pendency of this action, and refund all Block Rate Overcharges it has collected to Plaintiff and the Class. In addition, the Court should permanently enjoin the City from collecting any past Block Rate Overcharges and from imposing or collecting Block Rates in the future which exceed the City’s actual costs of providing treated water to Plaintiff and the Class.

**COUNT III**  
**ASSUMPSIT – MONEY HAD AND RECEIVED**  
**UNREASONABLE WATER RATES**

85. Plaintiff incorporates Paragraphs 1 through 64 of this Complaint, as if fully set forth herein.

86. Water Rates must be reasonable. *Mapleview Estates v. City of Brown City*, 258 Mich. App. 412.

87. A municipal utility charge is “unreasonable” if “viewed as a whole” it has been “excessive.” *See Youmans v. Bloomfield Township*, 336 Mich. App. 161, 219, 969 N.W.2d 570 (2021). As applied to Plaintiff and the Class, the City’s Block Rates are arbitrary, capricious, and unreasonable.

88. As a direct and proximate result of the City's improper conduct, the City has collected millions of dollars to which it is not entitled. By paying the Block Rate Overcharges, Plaintiff and the Class have conferred a benefit upon the City.

89. A claim to recover amounts paid to a governmental unit in excess of the amount allowed under law is properly filed as an equitable action in assumpsit for money had and received.

90. By virtue of the City's inclusion of the Block Rate Overcharges in the Rates, the City has collected amounts in excess of the amounts it was legally entitled to collect. Therefore, Plaintiff is entitled to maintain an equitable action of assumpsit to recover back the amount of the illegal exaction. *See, e.g., Bond v. Public Schools of Ann Arbor*, 383 Mich. 693, 704, 178 N.W.2d 484 (1970).

WHEREFORE, the City should be required to disgorge the revenues attributable to the Block Rate Overcharges imposed or collected by the City between August 1, 2022 and the date of the filing of this action, and during the pendency of this action, and refund all Block Rate Overcharges it has collected to Plaintiff and the Class. In addition, the Court should permanently enjoin the City from collecting any past Block Rate Overcharges and from imposing or collecting Block Rates in the future which exceed the City's actual costs of providing treated water to Plaintiff and the Class.

#### **COUNT IV** **UNJUST ENRICHMENT – UNREASONABLE WATER RATES**

91. Plaintiff incorporates Paragraphs 1 through 64 of this Complaint, as if fully set forth herein.

92. Water Rates must be reasonable. *Mapleview Estates v. City of Brown City*, 258 Mich. App. 412.

93. A municipal utility charge is “unreasonable” if “viewed as a whole” it has been “excessive.” *See Youmans v. Bloomfield Township*, 336 Mich. App. 161, 219, 969 N.W.2d 570 (2021). As applied to Plaintiff and the Class, the Block Rates are arbitrary, capricious and unreasonable.

94. As a direct and proximate result of the City's improper conduct, the City has collected millions of dollars to which it is not entitled. By paying the Block Rates Overcharges, Plaintiffs and the Class have conferred a benefit upon on the City.

95. The City has been unjustly enriched because it received Block Rate Overcharges to which it was not entitled, and it would be unfair for the City to retain the Block Rate Overcharges under the circumstances.

96. The City should be required to disgorge the amounts by which it has been unjustly enriched.

WHEREFORE, the City should be required to disgorge the revenues attributable to the Block Rate Overcharges imposed or collected by the City between August 1, 2022 and the date of the filing of this action, and during the pendency of this action, and refund all Block Rate Overcharges it has collected to Plaintiff and the Class. In addition, the Court should permanently enjoin the City from collecting any past Block Rate Overcharges and from imposing or collecting Block Rates in the future which exceed the City's actual costs of providing treated water to Plaintiff and the Class.

#### **PRAYER FOR RELIEF**

Plaintiff requests that the Court grant the following relief:

A. Certify this action to be a proper class action with Plaintiff certified as Class Representative and Kickham Hanley PLLC designated Class Counsel;

B. With respect to Counts I through IV, define the Class to include all Significant Users who/which have incurred or paid Block Rates at any time since August 1, 2022 and/or who/which incur or pay the Block Rates during the pendency of this action.

C. With respect to Counts I through IV, enter judgment in favor of Plaintiff and the Class and against the City, and order and direct the City to disgorge and refund all Block Rate

Overcharges collected and to pay into a common fund for the benefit of Plaintiff and all other members of the Class the total amount of Block Rate Overcharges to which Plaintiff and the Class are entitled;

D. Appoint a Trustee to seize, manage and distribute in an orderly manner the common fund thus established;

E. Permanently enjoin the City from collecting any past Block Rate Overcharges and from imposing or collecting Block Rates in the future which exceed the City's actual costs of providing treated water to Plaintiff and the Class;

F. Find and declare that the City has been unjustly enriched by collecting the Block Rate Overcharges, and permanently enjoin the City from collecting any past Block Rate Overcharges and from imposing or collecting Block Rates in the future which exceed the City's actual costs of providing treated water to Plaintiff and the Class;

G. Find and declare that all liens or encumbrances upon the properties of Plaintiff and the Class for unpaid Block Rate Overcharges are null, void and discharged.

H. Award Plaintiff and the Class the costs and expenses incurred in this action, including reasonable attorneys', accountants', and experts' fees; and

J. Grant any other appropriate relief.

KICKHAM HANLEY PLLC

/s/ Gregory D. Hanley

Gregory D. Hanley (P51204)  
Edward F. Kickham Jr. (P70332)  
Jamie Warrow (P61521)  
32121 Woodward Avenue, Suite 300  
Royal Oak, Michigan 48073  
(248) 544-1500  
Counsel for Plaintiff and the Class

Date: November 27, 2023

**JURY DEMAND**

Plaintiff hereby demands a trial by jury on all issues so triable.

KICKHAM HANLEY PLLC

/s/ Gregory D. Hanley

Gregory D. Hanley (P51204)

Edward F. Kickham Jr. (P70332)

Jamie Warrow (P61521)

32121 Woodward Avenue, Suite 300

Royal Oak, Michigan 48073

(248) 544-1500

Counsel for Plaintiff

Date: November 27, 2023

# EXHIBIT A

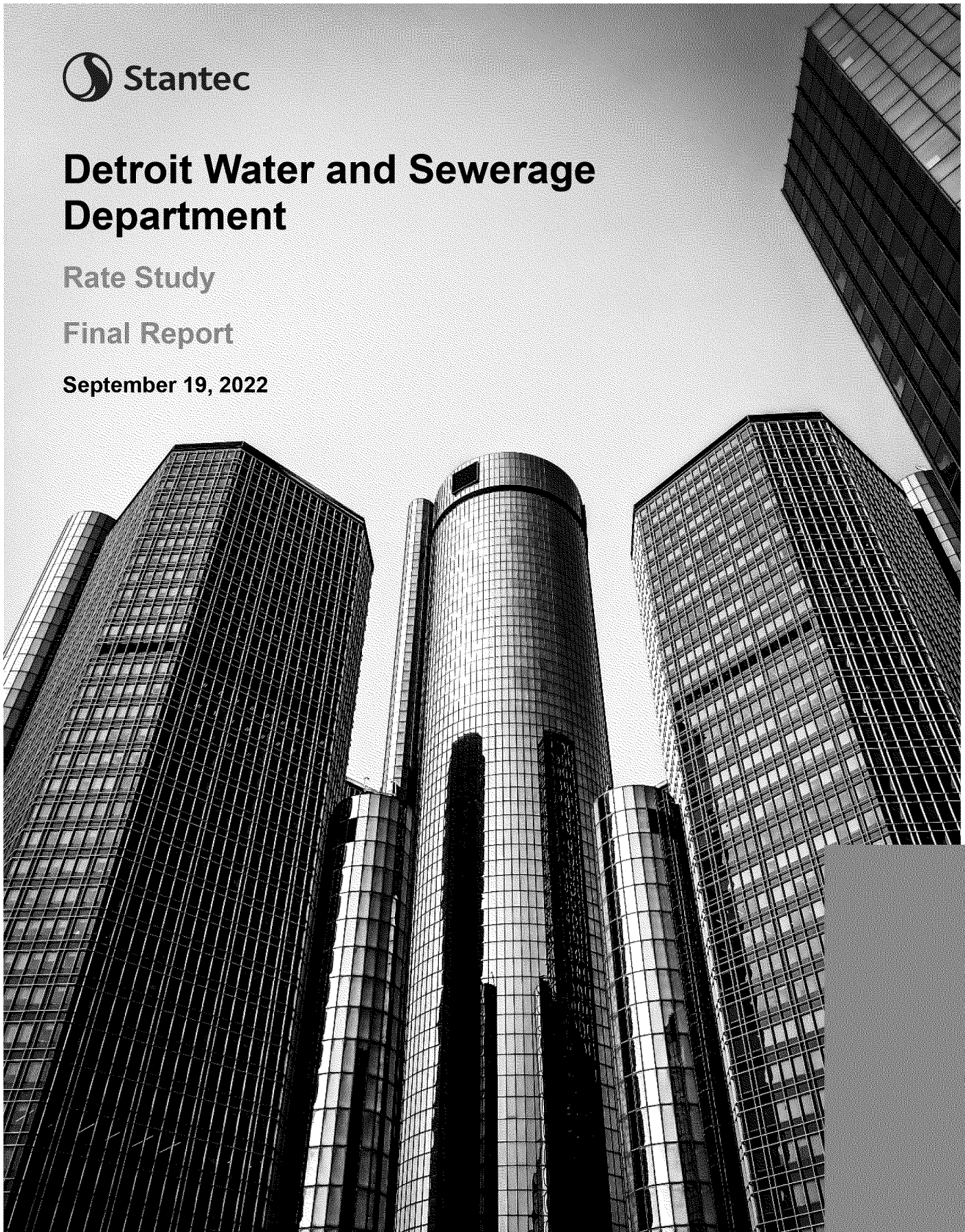


# **Detroit Water and Sewerage Department**

**Rate Study**

**Final Report**

**September 19, 2022**





September 19, 2022

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

Re: Rate Study

Dear Mr. Rahman,

Stantec Consulting Services Inc. is pleased to present this Final Report of the Rate Study (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 contact us. We appreciate the opportunity to be of service to DWSD and look forward to working with you again in the near future.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew J. Burnham".

Andrew J. Burnham  
Vice President/Project Director  
andrew.burnham@stantec.com  
(813) 204-3331

A handwritten signature in black ink, appearing to read "Carol F. Malesky".

Carol F. Malesky  
Sr. Principal/Project Manager  
carol.malesky@stantec.com  
(303) 410-4077

Enclosure

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# 1. EXECUTIVE SUMMARY

This executive summary outlines the background, objectives, approach, and results of the Rate Study (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 an enterprise agency of the City of Detroit and is a customer of the Great Lakes Water Authority (GLWA). The City of Detroit by and through the Water and Sewerage Department is GLWA’s agent to perform certain services and functions in Detroit, including setting retail rates to meet revenue requirements, billing and collecting from Detroit retail customers, and enforcing the collection of fees and charges. GLWA leases the City’s water supply and sewerage disposal facilities serving the regional service area and makes an annual payment that is used by DWSD to support capital infrastructure for its retail systems. 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 in January 2016. This Study also facilitates DWSD’s efforts to structure rates that adhere to proportionality<sup>1</sup> 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 reasonable 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. Identify key factors affecting future rate increases and compare results to national trends.

**Cost Allocation** – Allocate test year revenue requirements to water and combined sewer systems based on cost center categories and proportional usage characteristics of each system. Allocate water revenue requirements to water system functions and customers based on system and use

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<sup>1</sup> *Bolt v City of Lansing*, a 1998 Michigan Supreme Court decision, identified what is a valid user fee versus a tax, suggesting that user fees should be regulatory, proportional, and voluntary.

characteristics. Allocate combined sewer revenue requirements to wastewater and drainage based on functional categories and components of combined sewage 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-service analysis. Evaluate customer bill impacts, affordability programs currently available to DWSD customers, and possible future affordability programs. Perform bill comparisons to other agencies.

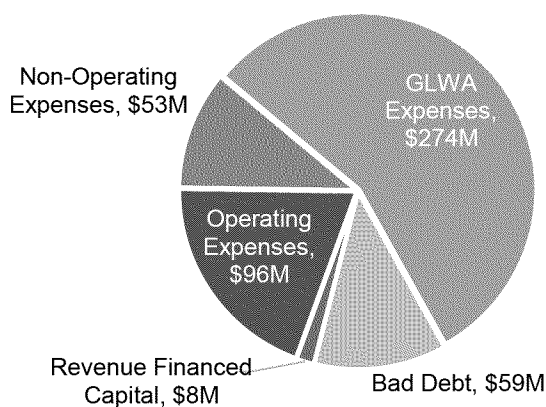
## 1.2 REVENUE REQUIREMENTS

Revenue requirements are the level of revenues needed to meet annual system costs. The revenue requirements analysis evaluated the adequacy of DWSD’s current revenues and the levels of rate increases needed to meet projected financial requirements for DWSD’s water and combined sewer systems over the 10-year period of Fiscal Year (FY) 2023 through FY 2032. The process included a review of DWSD’s operating expenses, non-operating expenses, GLWA wholesale treatment and pre-bifurcation debt expenses, bad debt, and capital expenses. The analysis also evaluated non-rate revenue sources of funding and identified a capital funding plan for the projected capital cost requirements.

Through this process, financial management plans and associated annual water, wastewater, and drainage rate revenue increases were developed to address current and projected DWSD costs. Based on the FY 2023 Adopted Budget, GLWA expenses (including wholesale treatment expenses and pre-bifurcation debt) are more than 55 percent of the total revenue requirement, while costs funded by customer rates that DWSD can “control” (operating expenses 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 DWSD combined water and sewer Revenue Fund by expense type.<sup>2</sup>

---

<sup>2</sup> In addition to the Revenue Fund, DWSD has an Improvement & Extension (I&E) fund that supports major capital expenses and is funded by the GLWA lease payment and transfers from the Revenue Fund.

**Figure 1-1: FY 2023 Revenue Requirement Summary**

Note: Non-Operating Expenses include pension requirements, Water Retail Assistance Program (WRAP) expenses, and industrial waste control (IWC) costs.

Stantec worked with DWSD to develop a sustainable financial management plan for the water and sewer systems that utilized available revenue sources, borrowing, and rate increases to support future expenditure requirements and reserve levels. The following are key assumptions impacting the forecast:

1. Water customer growth of 0.50 percent and wastewater customer growth of 0.25 percent per year in FY 2023 and beyond. Water and wastewater volume decline of 2.00 percent per year. No drainage customer growth. Growth assumptions were provided by DWSD staff and are consistent with historical trends.
2. Bad debt expense is assumed to be 10 percent of water rate revenue, 10 percent of sewer rate revenue, and 18 percent of drainage rate revenue, based on FY 2019 through FY 2021 historical revenue collection rates. The current shutoff moratorium is expected to end during FY 2023 and DWSD staff expects that bad debt expense should decrease to 8 percent of water rate revenue, 8 percent of sewer rate revenue, and 16 percent of drainage rate revenue by FY 2027, but this is an estimate and bad debt may increase or decrease depending upon the circumstances and available funding programs. However, these latter levels are consistent with longer-term historical collection rates provided by DWSD staff.
3. GLWA gross wholesale water and sewer treatment expenses are assumed to escalate by 4.00 percent per year based on GLWA estimates available at the time the Study was conducted;<sup>3</sup> DWSD operating costs are assumed to escalate by 2.60 percent per year, on average, based on the specific operating cost escalation factors shown in Schedule 5 of Appendices A and B. The

<sup>3</sup> 4.00% escalation is applied to the GLWA wholesale charge inclusive of the fixed ownership charge.

level of increases align with long-term inflationary trends that are consistent with the duration of the projection period of this Study.

4. Total anticipated capital improvement program spending of approximately \$258 million and \$218 million in FY 2023 through FY 2027 for the water and sewer systems, respectively, based on DWSD's FY 2023 5-Year CIP Plan.
5. Borrowing for future capital at 5.00 percent interest rate for revenue bonds and 2.00 percent for State Revolving Fund (SRF) loans based on DWSD staff input and recent SRF loan experience.
6. Minimum Operating Fund reserve target for each system of three months of annual operating expenses, consistent with industry practices to ensure availability of funds for unforeseen risks and cash flow purposes.
7. Principal forgiveness of 8.00 percent on future Drinking Water Revolving Fund (DWRF) loans based on input from DWSD staff based on recent DWRF loan experience per DWSD staff.

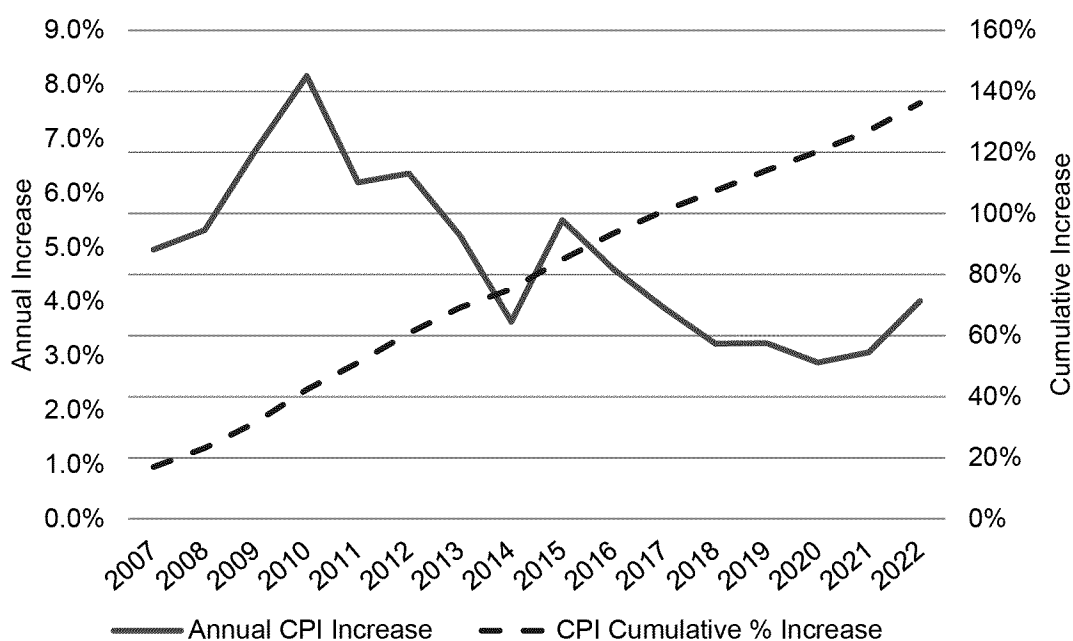
Based on DWSD budget data and the above assumptions, Stantec developed a plan of annual rate adjustments to fund DWSD's financial requirements. The level of projected water, wastewater, and drainage adjustments to rate revenues are shown in Table 1-1. The FY 2023 proposed rate adjustments reflect the results of the cost allocation study to rebalance the revenue needed from each system. The total amount of additional revenue generated by the rate increase for FY 2023 is 0.8 percent.

**Table 1-1: Projected Annual Rate Revenue Increases**

	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>
Effective Date	July 1, 2022 <i>Proposed</i>	July 1, 2023 <i>Projected</i>	July 1, 2024 <i>Projected</i>	July 1, 2025 <i>Projected</i>	July 1, 2026 <i>Projected</i>
Water Increase	21.2%	4.0%	4.0%	4.0%	4.0%
Wastewater Increase	-13.7%	4.0%	4.0%	4.0%	4.0%
Drainage Increase	1.8%	4.0%	4.0%	4.0%	4.0%
<b>Total Combined Increase</b>	<b>0.8%</b>	<b>4.0%</b>	<b>4.0%</b>	<b>4.0%</b>	<b>4.0%</b>

The future rate increase projections shown in Table 1-1 for FY 2024 through FY 2027 are dependent on the above assumptions. Any changes to the assumptions, such as changes in future interest rates or expense inflation may have an impact on the overall financial forecast and rate revenue projections. These variables will be important considerations in DWSD's annual budgetary and rate setting process moving forward.

The level of projected annual rate adjustments identified herein are consistent with national trends and Stantec's industry experience. As demonstrated in Figure 1-2, the U.S. Consumer Price Index (CPI) Water & Sewerage Maintenance Series, which specifically measures the average national change in the cost of water and wastewater service to households, has risen at an average annual rate of approximately 5.00 percent during the past ten years. Moreover, many of Stantec's clients across the country are presently experiencing rate increases in the range of 3.0 percent to 8.0 percent per year.

**Figure 1-2: US CPI - Water & Sewerage Maintenance Series**

US CPI, Water and sewerage maintenance, Series Id: CUUR0000SEHG01

### 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 practices and guidelines. Such practices and guidelines are documented by industry publications such as the American Water Works Association's (AWWA) M1 Principles of Water, Rates, Fees, and Charges<sup>4</sup>, the Water Environment Federation's (WEF) Manual of Practice No. 27<sup>5</sup>, the AWWA M22 Sizing Water Service Lines and Meters<sup>6</sup>, and the AWWA M29 Water Utility Capital Financing<sup>7</sup>.

Figure 1-3 below shows the cost-of-service allocation approach utilized in the Study. Total FY 2023 Operating Fund revenue requirements were first allocated between the water and combined sewer systems, and the combined sewer system costs were further allocated to wastewater and drainage. Water system costs were allocated to typical system components or functions, and wastewater costs

<sup>4</sup> Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, AWWA M1, Seventh Edition, 2017.

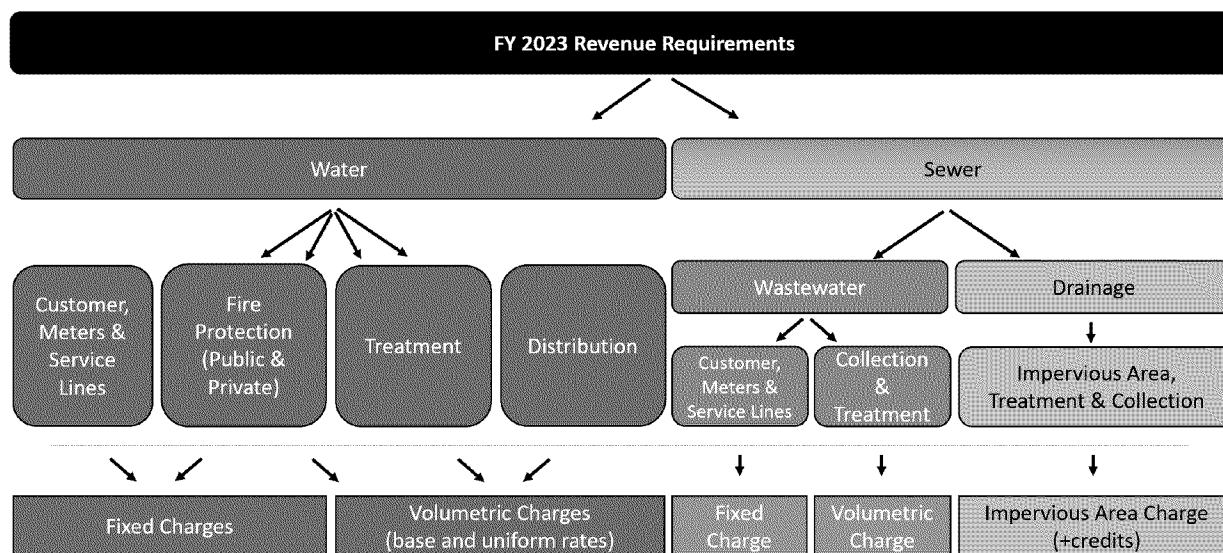
<sup>5</sup> Financing and Charges for Wastewater Systems, WEF Manual of Practice No. 27, 2019.

<sup>6</sup> Sizing Water Service Lines and Meters, AWWA M22, Third Edition, 2014.

<sup>7</sup> Water Utility Capital Financing, AWWA M29, Fourth Edition, 2014.

were similarly allocated to wastewater functions. The bottom portion of the graphic shows how the cost allocation forms the cost basis for the development of water, wastewater, and drainage charges.

**Figure 1-3: Cost Allocation Approach**

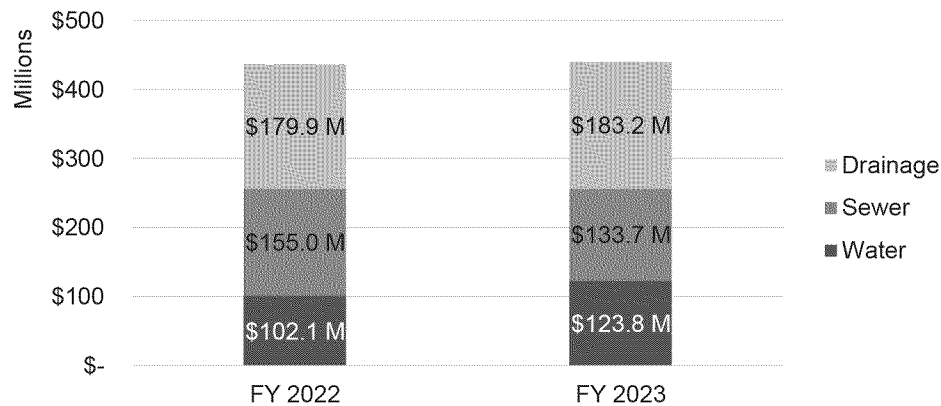


The Study followed the AWWA and WEF industry best practices by:

1. Allocating costs to water, wastewater, and drainage based on individual categories of costs and appropriate allocation criteria.
2. Allocating water and wastewater costs to individual functions or activities (such as supply, treatment, distribution, meters/services, etc.). This step is often called “functionalization” and it links costs with the functions utilities perform to meet customer demands.
3. Allocating water functional costs to the appropriate cost components (such as average use, maximum day demands, peak hour demands, customer service, etc.). This links costs with the customer usage and service characteristics that drive costs and is called the base/extra-capacity approach for cost allocation.<sup>8</sup>
4. Distributing each water cost component to customers in accordance with the demand and service characteristics placed on the system. This step identifies the units of service for customers based on meter size and billed volume.

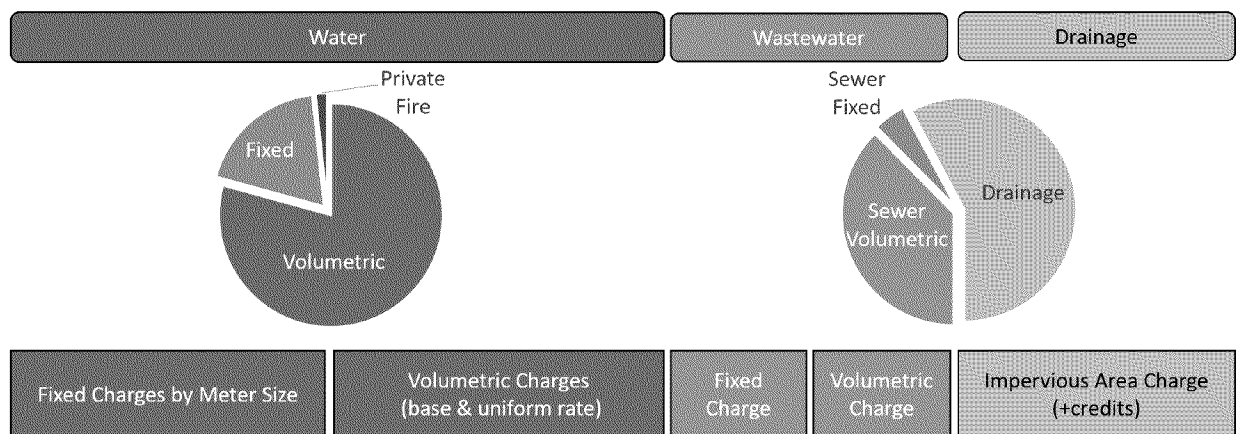
The results of the cost allocation to water, wastewater, and drainage are depicted in Figure 1-4, showing the total revenue requirements by system in FY 2022 and FY 2023. The results demonstrate that current revenues are generally proportional to the rate revenue requirements from the cost-of-service analysis. FY 2023 rate revenues will reflect the cost-of-service allocation results, which represents a shift of about \$20 million from wastewater to water and a small increase in drainage requirements (before credits).

<sup>8</sup> Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, AWWA M1, Seventh Edition, 2017.

**Figure 1-4: FY 2023 Rate Revenue Requirements 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, 2) conform to accepted national and local industry best practices, and 3) promote affordability, equity, and conservation. The cost allocation analysis connects the types of cost drivers with rate structure components as shown in Figure 1-5. The following sub-sections describe the rate structures in more detail.

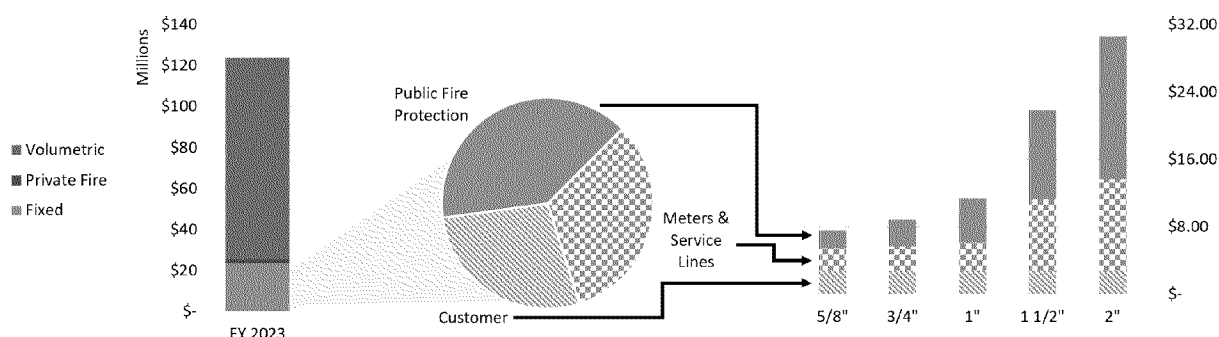
**Figure 1-5: Rate Design Approach**

**Water Fixed Charges** – Water fixed charges are proposed to 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 expenses) are scaled based on hydraulic capacity of each meter size.

Figure 1-6 shows the allocation of costs recovered in the proposed 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 1-6: Water Fixed Charge Approach**



Private fire costs are recovered in a separate fixed charge based on the size of each connection.

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

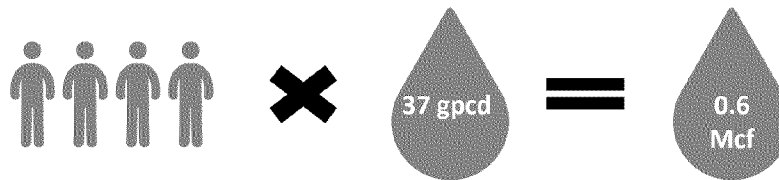
- Base tier threshold of 0.6 thousand cubic feet (Mcf) per month was calculated based on estimated indoor residential water use<sup>9</sup> and substantiated based on a review of DWSD FY 2021 monthly billed volume distributions.
- Base tier rate was calculated by dividing average day costs by total usage volume, plus Tier 1 peaking costs<sup>10</sup>, 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<sup>10</sup>, divided by Tier 2 volume. The higher tier reflects a proportionally greater allocation of costs to water users who impose increased burden on the system due to higher demands.

<sup>9</sup> Assumes four people per household and 36.7 gallons per capita per day based on *Residential End Uses of Water, Version 2*, The Water Research Foundation, 2016. Monthly usage calculates to be 4,040 gallons, or 0.6 Mcf.

<sup>10</sup> Peaking cost allocation based on proportional change in monthly volume in each tier from the lowest month to highest month, based on DWSD FY 2021 billing data.

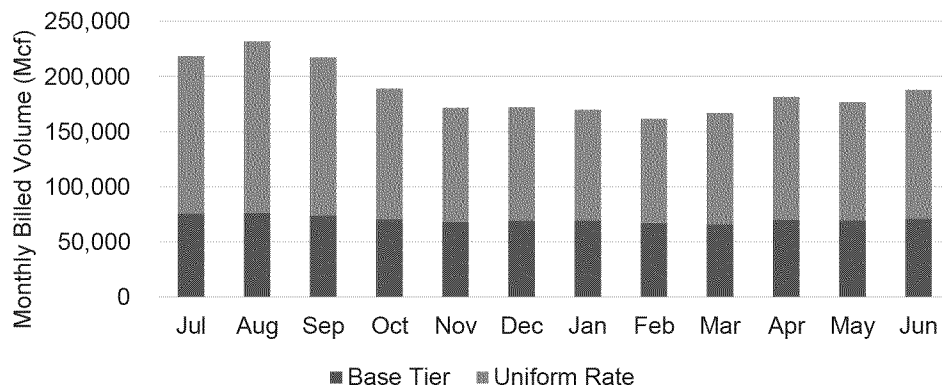
Figure 1-7 shows the calculation for the base tier size of 0.6 Mcf per month.

**Figure 1-7: Base Tier Size Analysis**

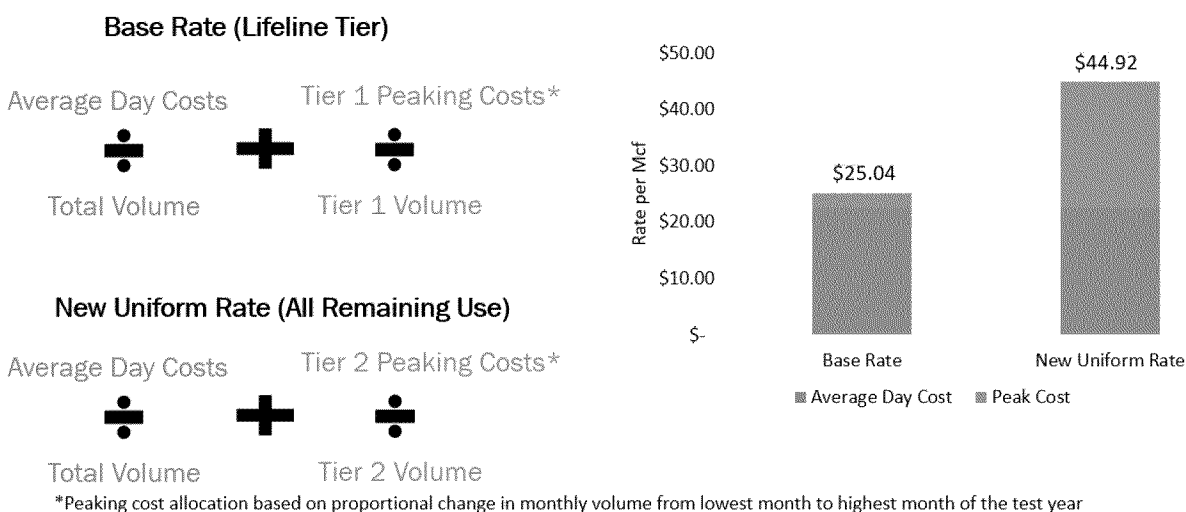


The following Figure 1-8 shows the resulting volume in each tier by month, based on DWSD's 2021 billing data. The chart demonstrates that there is minimal peaking in the base tier because the amount of water use in the base tier is consistent each month throughout the year.

**Figure 1-8: Amount of Water Use that Falls in Each Tier**



The following Figure 1-9 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. The water system incurs additional costs to meet peak demands; therefore, allocating peak costs to tiers in this way shifts peak costs to the customers who contribute to increasing peak demands.

**Figure 1-9: Water Volumetric Rates Pricing Analysis**

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

- Recover wastewater customer-related costs through a fixed monthly charge that applies equally to each customer bill.
- Proposed volumetric rate approach uses customer's monthly average winter consumption (AWC) or actual water use, whichever is lower, as basis for billing the volumetric rate.<sup>11</sup>
  - AWC is based on average water use from January through March.
  - AWC is applied to all customer classifications.
  - This change requires modifications to DWSD's billing system and will be implemented when feasible (see interim wastewater volumetric approach).
- Interim wastewater volumetric rate approach applies monthly cap of 1.2 Mcf on individually metered residential units.<sup>12</sup>
  - Continue using billed monthly water use for all other customers and allow deduct or water only metering configurations for other customers at their expense.

<sup>11</sup> Winter months are typically representative of indoor water use only. Outdoor water use, such as irrigation, does not return to the sewer system. Therefore, using the lesser of actual water use or winter average water consumption is generally accepted as a more accurate method of determining wastewater flow for billing purposes.

<sup>12</sup> Sewer caps are appropriate for residential customers that have relatively homogeneous usage profiles, compared to the wide variability of usage in commercial customers that make sewer caps problematic. That said, commercial customers can and do often utilize separate meters to capture water only demands not returning to the wastewater system.

- Use until AWC can be implemented through modifications to the billing system (FY 2024).

**Drainage Charges** – Drainage charges are recovered through a monthly charge applied based on impervious area.

- No changes recommended to DWSD's existing drainage rate structure.
- Update the drainage charge based on the current rate structure and cost-of-service results, customer credit program, Michigan Department of Transportation (MDOT) settlement, and latest Billable Impervious Area (BIA).

### Water, Wastewater, and Drainage Rates and Charges

DWSD annually adopts a rate schedule for water, wastewater, and drainage rates as part of its budget process. Below are the current FY 2022 and proposed FY 2023 rates and charges.

The current and proposed monthly water meter charges are shown in Table 1-2.

**Table 1-2: 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 1-3.

**Table 1-3: 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 (0-0.6 Mcf)	\$25.04
		Uniform Tier (>0.6 Mcf)	\$44.92

The current and proposed private fireline charges are shown in Table 1-4.

**Table 1-4: Summary of Current and Proposed Private Fireline Charges**

Connection 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 1-5.

**Table 1-5: 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 1-6.

**Table 1-6: 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 1-7.

**Table 1-7: 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	\$678.28

### Customer Bill Impacts

Table 1-8 presents a summary of the combined 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 1-8: Single Family Combined Water, Wastewater, and Drainage Bill Comparisons  
(5/8" Meter)**

Water Use (Mcf)	Percentage of Bills	Current Bill	Proposed Bill	\$ Change	% Change
0.0	11%	\$39.79	\$39.37	-\$0.42	-1.1%
0.1	19%	\$48.15	\$47.41	-\$0.74	-1.5%
0.2	31%	\$56.52	\$55.45	-\$1.07	-1.9%
0.3	43%	\$64.89	\$63.50	-\$1.39	-2.1%
0.4	54%	\$73.25	\$71.54	-\$1.71	-2.3%
0.5	64%	\$81.62	\$79.59	-\$2.03	-2.5%
0.6	72%	\$89.98	\$87.63	-\$2.35	-2.6%
0.7	78%	\$98.35	\$97.66	-\$0.69	-0.7%
0.8	83%	\$106.72	\$107.69	\$0.97	0.9%
0.9	86%	\$115.08	\$117.73	\$2.65	2.3%
1.0	89%	\$123.45	\$127.76	\$4.31	3.5%
1.1	91%	\$131.81	\$137.79	\$5.98	4.5%
1.2	92%	\$140.18	\$147.82	\$7.64	5.5%
1.3	94%	\$148.55	\$152.31	\$3.76	2.5%

Note:

1. Proposed bill reflects water, wastewater, and drainage FY 2023 revenue requirements.
2. Proposed bill reflects water rate structure changes and wastewater volumetric rate cap of 1.2 Mcf.
3. Assumes 0.05 billable impervious acres for drainage portion of bill.

Affordability of service is important to DWSD and effective August 1, 2022, customer assistance to qualifying customers is provided through GLWA's Water Rate Assistance Program (WRAP) funding and Federal Low Income Household Water Assistance Program (LIHWAP)<sup>13</sup> funding. DWSD administers program funds through its pilot Lifeline Affordability Plan. The Lifeline Plan was created by DWSD to provide low-income customers with non-rate revenue funds from WRAP and LIHWAP to help cover their bills. While the shut-off moratorium ended in the State March 31, 2021, the City of Detroit and DWSD extended the moratorium through 2022<sup>14</sup>. The Lifeline Plan offers qualifying residential customers a fixed monthly bill for the first 4,500 gallons of water, pays off arrearages, and offers plumbing repairs at households using more than 4,500 gallons of water per month. In the Lifeline Plan, there are three

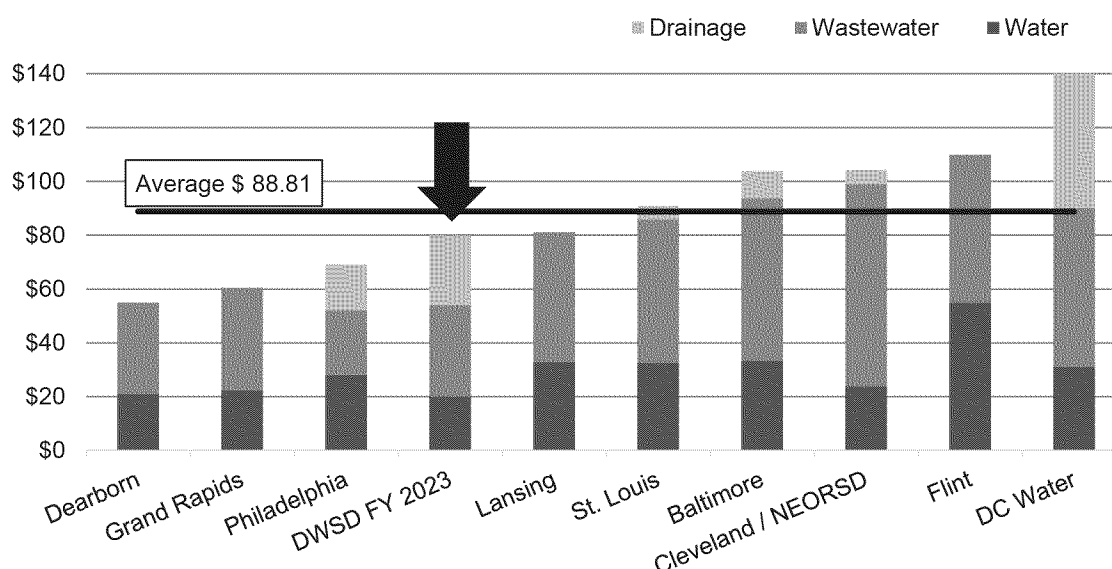
<sup>13</sup> The LIHWAP program provides up to \$1,000 in assistance to low-income customers with disconnected services or those facing disconnection. Low Income Household Water Assistance Program, Michigan LIHWAP Profile Summary, RPT\_LIHWAP\_Profile Summary\_MI\_FY2022 (hhs.gov).

<sup>14</sup> <https://detroitmi.gov/news/mayor-dwsd-extend-moratorium-residential-water-shutoffs-through-2022-and-announce-intention>

payment tiers: \$18/month for water, sewer, and drainage bill if household income is at or below 135% of Federal Poverty Level; \$43/month if household income is above 135% of FPL but at or below 150% of FPL; and \$56/month if household income is above 150% of FPL but at or below 200% of FPL. The gap amount between the payment tiers offered under the Lifeline Plan and the customer's actual bill are paid with WRAP and LIHWAP assistance funding. DWSD continues to review the use of outside funding sources and is actively lobbying for continued funding under LIHWAP appropriation to assist its neighbors in need, as the current LIHWAP program will end in September 2023.

Stantec prepared a survey of monthly residential bills for local and national peers. Figure 1-10 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 \$79.59 per month is lower than the average bill of \$88.81 per month.

**Figure 1-10: Monthly Residential Bill Comparison**



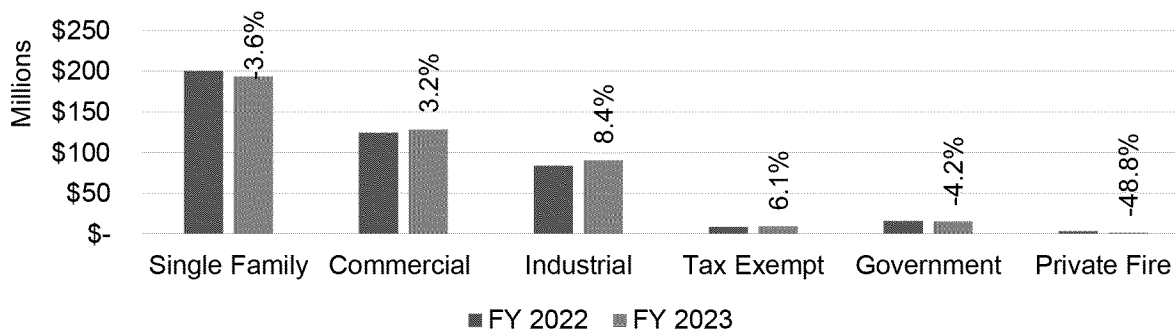
Note:

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 billable 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 some will likely increase in FY 2023.

While only residential bill impacts are shown in Table 1-8 and Figure 1-10, non-residential customers will have varying impacts based on each customer's meter size, monthly water volume, and impervious area. Figure 1-11 shows a summary of revenue impacts aggregated for various customer classifications based on FY 2023 rates (assuming AWC for wastewater billing) and customer billing data. Generally, the range

of impact is dependent upon the amount and distribution of monthly water use of individual customers within each classification as this will impact how much water is billed in each tier of the proposed water rate structure as well as how much volume is billed wastewater volumetric charges.

**Figure 1-11: FY 2023 Estimated Change in Revenue by Customer Class**



## 1.5 FINDINGS AND RECOMMENDATIONS

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

1. FY 2023 rate adjustments reflect the results of the cost allocation analysis that rebalance revenue from each system. The total revenue increase needed from FY 2022 to FY 2023 is 0.8 percent.
2. FY 2023 cost allocation of revenue requirements results in a \$20 million shift in costs from wastewater to water from FY 2022 revenues based on a detailed allocation of operating and capital costs reflecting current and planned activities.
3. Water rate structure revised to apply base rate to water use that is consistent throughout the year and allocate peaking costs to the base rate and a new uniform rate in proportion to the contribution to the peak demands on the system from use in each tier.
4. Wastewater rate structure revised to bill volumetric rate based on lesser of actual water use or average winter consumption, calculated based on January through March water use by FY 2024.
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 individually metered residential customers and bill actual water use for all other customers.
6. Continue to charge drainage rate 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. Update rate revenue requirements annually and perform periodic rate studies (every 3 to 5 years) to address changes in cost distributions between services and customer characteristics.

## 2. BACKGROUND & OBJECTIVES

Stantec Consulting Services Inc. (Stantec) has conducted a comprehensive rate study (Study) for the Detroit Water and Sewerage District (DWSD or “the Utility”). This report outlines the background, objectives, approach, and results of the Study.

### 2.1 BACKGROUND

DWSD provides water, wastewater, and drainage services to a customer base of approximately 230,000 accounts. DWSD is an enterprise agency of the City of Detroit and is a customer of the Great Lakes Water Authority (GLWA). The City of Detroit by and through the Water and Sewerage Department is GLWA’s agent to perform certain services and functions in the City, including setting retail rates to meet revenue requirements, billing and collecting from Detroit retail customers, and enforcing the collection of fees and charges. GLWA leases the City’s water supply and sewerage disposal facilities serving the regional service area and makes an annual payment that is used to support capital infrastructure of its retail system. 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 in January 2016. This Study also facilitates DWSD’s efforts to structure rates that adhere to proportionality<sup>15</sup> 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 reasonable and transparent.

### 2.2 OBJECTIVES

**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. Identify key factors affecting future rate increases and compare results to national trends.

**Cost Allocation** – Allocate test year revenue requirements to water and combined sewer systems based on cost center categories and proportional usage characteristics of each system. Allocate water revenue requirements to water system functions and customers based on system and use

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<sup>15</sup> *Bolt v City of Lansing*, a 1998 Michigan Supreme Court decision, identified what is a valid user fee versus a tax, suggesting that user fees should be regulatory, proportional, and voluntary.

characteristics. Allocate combined sewer revenue requirements to wastewater and drainage based on functional categories and components of combined sewage 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-service analysis. Evaluate customer bill impacts, affordability programs currently available to DWSD customers, and possible future affordability programs. Perform bill comparisons to other agencies.

## 2.3 RESOURCES

In addition to relying on its knowledge and experience, Stantec relied on several industry resources in the conduct of this Study, notably including guidance and practices from the American Water Works Association (AWWA) and the Water Environment Federation (WEF) as reflected in the following resources:

- i. **Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, AWWA M1, Seventh Edition.** This manual is intended to help policymakers and rate analysts consider all relevant factors when evaluating/defining customer classes, performing cost of service allocations, and selecting/calculating specific rate structures. It is a comprehensive collection of guidance on a variety of issues associated with designing and developing water rates and charges.
- ii. **Financing and Charges for Wastewater Systems, WEF MOP 27, Fourth Edition.** This manual provides an overview of the current practices and procedures that should be considered for financing and establishing rates and charges for sanitary sewer collection and treatment systems. It is intended to provide guidance by illustrating various ways of analyzing and allocating the operating and capital costs associated with collecting and treating wastewater and developing rates and charges that fairly and reasonably reflect the cost of providing service to different customers.
- iii. **Sizing Water Service Lines and Meters, AWWA M22, Third Edition.** This manual provides demand and maximum expected flow estimates that can be used to determine the appropriate size of new service lines and meters.
- iv. **Water Utility Capital Financing, AWWA M29, Fourth Edition.** This manual provides support for obtaining funding and financing for water utility capital projects. It is intended as a resource for utilities with short- and long-term capital needs to obtain funding through both traditional and innovative funding sources.

*It is important to note that these industry resources are meant to provide guidance to the cost-of-service and rate-making process. There is no single approach that fits a utility perfectly. WEF MOP 27 states (p 2), “As individual wastewater utilities address their financial management challenges, it is important that their practices for setting rates and charges be responsive to the unique circumstances and values of the communities they serve. Accordingly, this MOP offers industry-accepted guidance in addressing these challenges without prescribing specific methods. In many instances, acceptable methodological alternatives are presented.”*

## 3. REVENUE REQUIREMENTS

### 3.1 DESCRIPTION

This section presents the financial management plan and corresponding plan of water, wastewater, and drainage rate adjustments developed for the Utility in the revenue requirements analysis conducted as part of this Study. The following sub-sections of the report present a description of the source data, assumptions, and results of the revenue requirements analysis, while Appendices A and B include detailed supporting schedules for the financial management plans identified herein for the water and sewer systems, respectively.

The revenue requirements analysis evaluated the adequacy of DWSD's current revenues and the levels of rate increases needed to meet projected financial requirements for DWSD's systems over the 10-year period of Fiscal Year (FY) 2023 through FY 2032. The process included a review of DWSD's operating expenses, non-operating expenses, GLWA wholesale treatment and pre-bifurcation debt expenses, bad debt, and capital expenses. The analysis also evaluated non-rate revenue sources of funding and identified a capital funding plan based for the projected capital cost requirements.

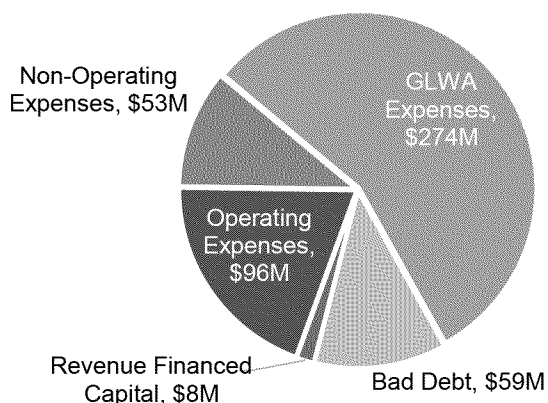
Stantec obtained DWSD's historical and budgeted financial information regarding the operation of its water and sewer systems, as well as historical customer counts and volume data by type of customer. Stantec also obtained the Utility's multi-year capital improvement program (CIP) and documented the Utility's current debt service obligations and covenants, or promises made to lenders, relative to net income coverage requirements and reserve levels. Stantec also consulted with DWSD regarding other assumptions and policies that would affect the performance of the Utility, such as trends in demands, customer growth, bad debt, debt service coverage and fund reserve levels, capital funding sources, earnings on invested funds, and escalation rates for operating costs.

These data and assumptions were entered into two separate versions of Stantec's proprietary Financial Analysis and Management System (FAMS) interactive modeling system, one for the water system and one for the combined sewer system. FAMS produced a 10-year projection of the sufficiency of the revenue provided by the existing rates for each system to meet current and projected financial requirements. These projections further determined the overall level of rate revenue increases necessary in each year of the projection period to satisfy each system's annual financial requirements.

Through this process, financial management plans and associated annual water, wastewater, and drainage rate revenue increases were developed to address current and projected DWSD costs. Based on the FY 2023 Adopted Budget, GLWA expenses (including wholesale treatment expenses and pre-bifurcation debt) are more than 55 percent of the total revenue requirement, while costs funded by customer rates that DWSD can "control" (operating expenses and revenue financed capital costs)

represent 21 percent of the total revenue requirement. Figure 3-1 shows a summary of FY 2023 revenue requirements for the DWSD combined water and sewer Revenue Fund by expense type.<sup>16</sup>

**Figure 3-1: FY 2023 Revenue Requirement Summary**



Note: Non-Operating Expenses include pension requirements, Water Retail Assistance Program (WRAP) expenses, and industrial waste control (IWC) costs.

## 3.2 SOURCE DATA

The following presents the key source data relied upon for conducting the revenue requirements analysis:

### Beginning Fund Balances

The FY 2022 year ending cash balance provided by DWSD was used to establish beginning FY 2023 balances for the water and sewer models. Balances for the water and sewer systems were each comprised of the Revenue Fund, the Improvement and Extension (I&E) Fund, and the Construction Fund, which contains existing bond proceeds. The Revenue Fund balance reflects the results of operating and non-operating cash flow each year, while the I&E Fund and Construction Fund balances are applied to specific eligible capital projects, based on input from DWSD.

### Revenues

The rate revenues utilized in the revenue requirements analysis reflect the water, wastewater, and drainage revenue requirements for FY 2023, based on the cost-of-service analysis. Non-rate revenues consist of other operating revenue, non-operating revenue, and interest income. The FY 2023 Budget was used to project all non-rate revenue amounts, excluding interest income, which was calculated

<sup>16</sup> In addition to the Revenue Fund, DWSD has an Improvement & Extension (I&E) fund that supports major capital expenses and is funded by the GLWA lease payment and transfers from the Revenue Fund.

annually based on projected average fund balances and assumed interest rates. Lease revenue received from GLWA is reflected in the I&E Fund.

Other operating revenues include various miscellaneous fees, such as penalties, permit review fees, inspection fees, and other fees for activities completed by DWSD staff. Typically, late fees and disconnection fees are tools available to utilities to recover costs of service and avoid providing free service. The State of Michigan implemented a moratorium on water service shut-offs during the COVID-19 pandemic. While the shut-off moratorium ended in the State March 31, 2021, the City of Detroit and DWSD extended the moratorium through 2022<sup>17</sup>.

Stantec provided DWSD with an Excel spreadsheet tool that builds the cost basis for miscellaneous fees using labor and materials inputs. The benefit of cost-based fees is that the costs of service are being recovered from those benefitting from the service. Revenues collected for these services are used to offset the user rate revenue requirement. Stantec recommends that DWSD staff assess which fees require updated calculations based on cost, implement cost-based fees if appropriate, and evaluate the impact to the revenue requirements of the cost-based fees. At this time, no changes in these miscellaneous fees are projected in Stantec's forecast of other operating revenues.

### **Operating Expenditures**

The Utility's operating expenditures include all operating and maintenance expenses, pension requirements, WRAP expenses, GLWA wholesale charges, and pre-bifurcation debt expenses. The revenue requirements analysis based the operating expenditure projections on the FY 2023 Adopted Budget, adjusted annually based on assumed cost escalation factors that were reviewed with DWSD.

### **Capital Improvement Program**

DWSD provided a multi-year CIP, in project level detail, from FY 2023 through FY 2027. For the following five years of the analysis, FY 2028 through FY 2032, projected capital costs were estimated based on historical trends and considering current costs. The CIP has been adjusted using an execution factor to bring projections in line with historical CIP budget versus actual performance and DWSD staff estimates of approximately \$50 million for water and \$40 million for sewer and storm drainage projects per year.

In total, the CIP (including execution) from FY 2023 through FY 2032 is approximately \$509 million and \$418 million for the water and sewer systems, respectively. A list of projects and costs by year is included on Schedule 6 of Appendices A and B for the water and sewer systems, respectively.

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<sup>17</sup> <https://detroitmi.gov/news/mayor-dwsd-extend-moratorium-residential-water-shutoffs-through-2022-and-announce-intention>

### 3.3 ASSUMPTIONS

The following presents the key assumptions utilized in conducting the revenue requirement analysis.

#### Cost Escalation

Annual cost escalation factors for various types of operating and maintenance expenses were developed based on discussions with DWSD, a review of historical trends, and Stantec's industry experience. The specific escalation factors assumed for various categories of expenses can be found on Schedule 5 of Appendices A and B for the water and sewer systems, respectively. GLWA wholesale treatment costs are based on the FY 2023 Service Charges Proposal provided by GLWA and are assumed to escalate by 4.00 percent per year, beginning in FY 2024.<sup>18</sup> Other operating costs escalation is based on assumptions as of this Study; however, the inflationary environment is expected to be volatile and DWSD should be vigilant in updating these assumptions going forward.

#### Interest Earnings

The analysis reflects assumed interest earning rates of 0.00 percent in FY 2023 based on the FY 2023 Adopted Budget, 0.25 percent in FY 2024, 0.50 percent in FY 2025, and 0.75 percent in FY 2026 and each year of the forecast period based on DWSD projections.

#### Customer and Volume Forecast

Customer and billed volume projections were based on DWSD estimates for FY 2023 through FY 2031 that reflect recent historical trends. Table 3-1 presents the assumed customer growth and assumed changes in volume by year through FY 2027. For FY 2028 through FY 2032, customer growth and volume changes are assumed to continue at the same levels as forecast for FY 2023 through FY 2027. The assumed growth in customers and changes in billed volume is used to forecast fixed charge revenue and volumetric rate revenue, respectively.

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<sup>18</sup> 4.00% escalation is applied to the GLWA wholesale charge inclusive of the fixed ownership charge.

**Table 3-1: Water and Wastewater Projected Customer and Volume Growth**

	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
<b>Water</b>					
Customer Growth	0.50%	0.50%	0.50%	0.50%	0.50%
Volume Growth	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%
<b>Wastewater</b>					
Customer Growth	0.25%	0.25%	0.25%	0.25%	0.25%
Volume Growth	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%
<b>Drainage</b>					
Customer / Impervious Area Growth	0.00%	0.00%	0.00%	0.00%	0.00%

### Bad Debt

Due to the moratorium on shutoffs, DWSD's bad debt on water and combined sewer revenues in recent years (FY 2019 through FY 2021) has ranged from 6 percent to 12 percent for water and from 9 percent to 14 percent for the combined sewer system. Staff estimates that water and wastewater bad debt expense will be 10 percent as long as the current moratorium is in place, and drainage bad debt expense will be 18 percent, to result in a combined sewer bad debt of 14 percent. Bad debt expense is expected to be reduced to 8 percent for water and wastewater and 16 percent for drainage by FY 2027 in a response to the elimination of the moratorium on shutoffs and customer assistance programs. Current and future federal funding and customer assistance programs, and other factors, may impact the levels of bad debt.

### Minimum Reserve Fund Balance Policy

Reserve balances for utilities are funds set aside for a specific cash flow requirement, financial need, project, task, or legal covenant. These balances are maintained to meet short-term cash flow requirements and minimize the risk associated with meeting the financial obligations and continued operational and capital needs under adverse conditions. The level of reserves maintained by a utility is an important component and consideration of developing a utility's multi-year financial management plan.

Many utilities, rating agencies and the investment community as a whole place a significant emphasis on having sufficient reserves available for potentially adverse conditions. The rationale related to the maintenance of adequate reserves is twofold. First, it helps to ensure that a utility will have adequate funds available to meet its financial obligations during unusual periods (i.e., when revenues are unusually low and/or expenditures are unusually high). Second, it provides funds that can be used for emergency repairs or replacements to the system, which can occur because of natural disasters or unanticipated system failures.

The financial management plans presented in this report assume that the Utility will maintain a minimum Revenue Fund balance, or reserve, equal to three months of annual operating reserves. In addition, DWSD will maintain a reserve of six months of lease revenue in the I&E Fund. These levels of reserve

fund balances are consistent with 1) Stantec's industry experience for similar systems, 2) the findings of reserve fund studies and guidelines prepared by the AWWA, and 3) a healthy level of reserves for a municipal utility system, per the evaluation criteria published by municipal utility rating agencies such as Fitch, Moody's, and Standard & Poor's. The recommended financial plan presented herein transfers funds to the I&E fund to pay for future capital projects when funds are available per GLWA's master bond ordinance.

### Future Borrowing and Capital Funding

Capital projects are assumed to be funded with cash, revenue bonds, and State Revolving Fund (SRF) loans. Project funding sources are determined based on eligibility of available funds and minimum fund balance reserves in each year of the projection period. Future revenue bonds are assumed to be issued for a 20-year term, at an interest rate of 5.00 percent. SRF loans are assumed to be issued for a 30-year term at an interest rate of 2.00 percent and reflect 8.00 percent principal forgiveness. Debt service payments from revenue bonds and SRF loans are assumed to be paid for using I&E revenues. The Utility's actual future financing and funding decisions will reflect actual future conditions, but the projections in the revenue requirements analysis reflect realistic overall conditions and are appropriate for planning purposes. Given the current interest rate environment as of the date of this Study, DWSD should continue to monitor borrowing costs and update revenue requirement projections annually. A complete schedule of assumed future borrowing can be found in Schedules 11 and 12 of Appendices A and B for the water and sewer systems, respectively.

## 3.4 RESULTS

Based on the data, assumptions and policies presented herein, DWSD's current water and sewer rates will not provide sufficient revenue to meet its ongoing debt service, discrete capital investment appropriately financed through revenue, operation and maintenance expenses, and reserve requirements over an extended multi-year projection period. The level of projected water, wastewater, and drainage adjustments to rate revenues needed to meet these requirements are shown in Table 3-2. The FY 2023 proposed rate adjustments reflect the results of the cost allocation study to rebalance the revenue needed from each system. The total amount of additional revenues generated by the rate increases shown in FY 2023 is 0.8 percent.

**Table 3-2: Projected Annual Rate Revenue Increases**

	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>
Effective Date	July 1, 2022 <i>Proposed</i>	July 1, 2023 <i>Projected</i>	July 1, 2024 <i>Projected</i>	July 1, 2025 <i>Projected</i>	July 1, 2026 <i>Projected</i>
Water Increase	21.2%	4.0%	4.0%	4.0%	4.0%
Wastewater Increase	-13.7%	4.0%	4.0%	4.0%	4.0%
Drainage Increase	1.8%	4.0%	4.0%	4.0%	4.0%
<b>Total Combined Increase</b>	<b>0.8%</b>	<b>4.0%</b>	<b>4.0%</b>	<b>4.0%</b>	<b>4.0%</b>

It is important to note that the projections of future conditions underlying this analysis are estimates. There are multiple factors beyond the Utility's control, such as: 1) bad debt and shut offs, 2) grant

funding, 3) GLWA wholesale treatment cost increases, and 4) interest rates and inflation. Moreover, the projections in this Study rely on data and guidance provided during the Study, and while the information utilized in this Study is believed to be reliable, detailed independent reviews or auditing of the data were not conducted. As a result, there will usually be differences between forecast and actual results because events and circumstances frequently do not occur as expected, and those differences may be material.

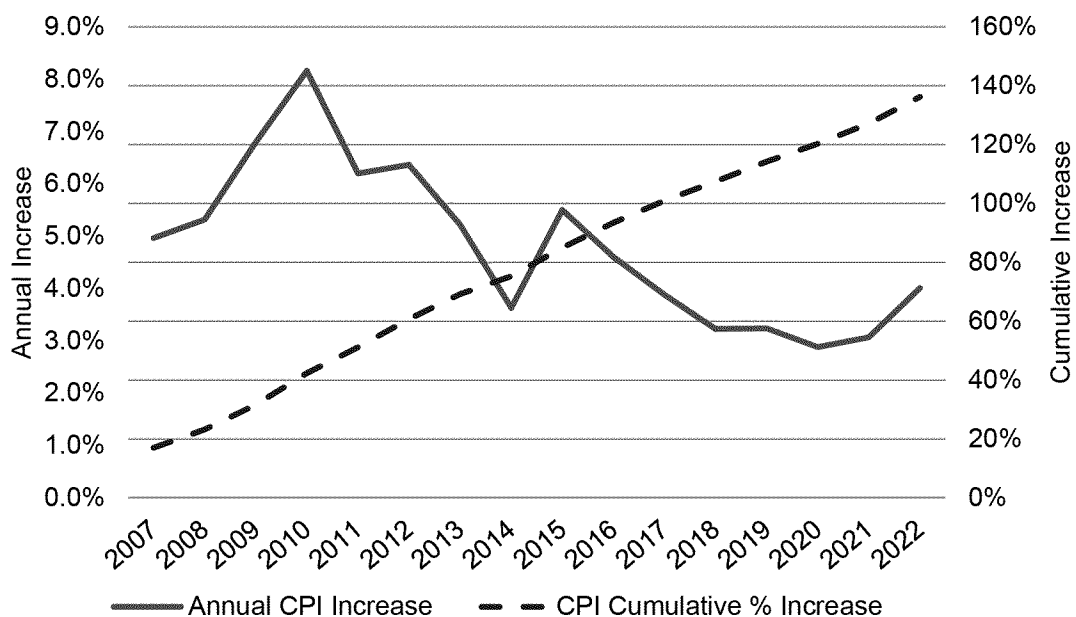
Any changes to the assumptions, such as a reduction in the bad debt expense that may occur as a result of resuming shutoffs or assistance programs, or changes in future interest rates or expense inflation may have an impact on the overall financial forecast and level of rate increase requirements. These variables will be important considerations in DWSD's annual budgetary and rate setting process moving forward.

Appendices A and B include detailed schedules presenting all components of the financial management plan developed for the Utility.

### Local and National Water and Sewer Cost Trends

The rate adjustments identified herein are consistent with national trends and Stantec's industry experience. As demonstrated in Figure 3-2 the U.S. Consumer Price Index (CPI) Water & Sewerage Maintenance Series, which specifically measures the average national change in the cost of water and wastewater service to households, has risen at an average annual rate of approximately 5.0 percent during the past ten years. Moreover, many of Stantec's clients across the country are presently experiencing rate increases in the range of 3.0 percent to 8.0 percent per year.

**Figure 3-2: US CPI - Water & Sewerage Maintenance Series**



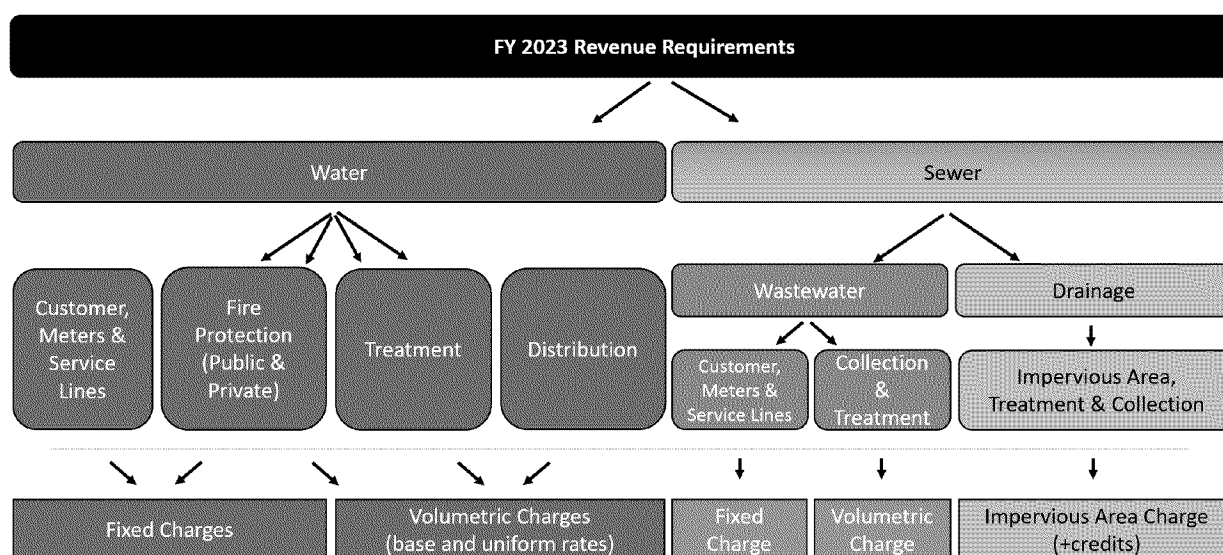
US CPI, Water and sewerage maintenance, Series Id: CUUR0000SEHG01

## 4. COST ALLOCATION

The purpose of a cost-of-service analysis is to proportionally distribute identified revenue requirements among the various systems and 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<sup>19</sup> and the Water Environment Federation's (WEF) Manual of Practice No. 27<sup>20</sup>.

Figure 4-1 shows the cost-of-service allocation approach followed in this Study. Total FY 2023 Operating Fund revenue requirements were first allocated between the water and sewer systems, and sewer system costs were further allocated between wastewater and drainage. Water system costs were allocated to water functions, and wastewater costs were similarly allocated to wastewater functions. The bottom portion of the graphic shows how the cost allocation forms the cost basis for the development of water, wastewater, and drainage charges.

**Figure 4-1: Cost of Service Approach**



The Study followed AWWA and WEF industry practices and guidance by:

1. Allocating costs to water, wastewater, and drainage based on individual categories of costs and appropriate allocation criteria.

<sup>19</sup> Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, AWWA M1, Seventh Edition, 2017,

<sup>20</sup> Financing and Charges for Wastewater Systems, WEF Manual of Practice No. 27, 2019

2. Allocating water and wastewater costs to individual functions or activities (such as supply, treatment, distribution, meters/services, etc.). This step is often called “functionalization” and it links costs with the functions utilities perform to meet customer demands.
3. Allocating water functional costs to the appropriate cost components (such as average use, maximum day demands, peak hour demands, customer service, etc.). This links costs with the customer usage and service characteristics that drive costs and is called the base/extra-capacity approach for cost allocation.<sup>21</sup>
4. Distributing water cost components to customers in accordance with the demand and service characteristics that customers place on the system. This step identifies the units of service for customers based on meter size and billed volume.

## 4.1 COST-OF-SERVICE APPROACH

Cost allocation studies reflect the analysis of conditions during a test year, selected to provide a normalized set of circumstances regarding key factors, including operating and capital costs, consumption patterns and revenues, weather influences, and other factors. As noted in Section 3, the revenue requirements analysis projected annual water and sewer system needs based on current conditions and budgets. The cost allocation analysis compiles the current needs and apportions them across DWSD’s systems using specific factors. Revenue requirements for FY 2023 were selected as the test year for the purposes of this cost allocation analysis. The following sections describe how the test year revenue requirements were allocated to systems, functions, cost components, and charge types.

### Allocation to Water and Combined Sewer Systems

The allocation of operating expenses, non-operating expenses, and revenue financed capital reflect the specific activities involved in providing water and combined sewer service. Costs from the FY 2023 Budget were aggregated by cost center and allocated between water and sewer systems based on input and data provided from DWSD staff. DWSD’s detailed budget categories simplified the allocation process, allowing direct data-driven allocations in many cases. Expenses with general benefit and no direct link to a key functional category (i.e., indirect expenses) were allocated in proportion to the direct allocation of water and sewer operating costs. The resulting cost allocations by expense type (excluding bad debt) are shown in Table 4-1. Allocation factors and detailed cost allocations are shown in Schedule 2 and Schedule 3 of Appendix C, respectively.

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<sup>21</sup> Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, AWWA M1, Seventh Edition, 2017.

**Table 4-1: FY 2023 Costs Allocated to Water and Sewer Systems (\$M)**

	Water	Sewer	Total
Operating Expenses	\$43.4	\$53.1	\$96.5
Non-Operating Expenses	\$21.6	\$31.5	\$53.1
GLWA Expenses	\$56.4	\$217.3	\$273.7
Revenue Financed Capital	\$6.6	\$1.2	\$7.8
Total Revenue Requirement	\$128.0	\$303.1	\$431.1

#### **Allocation of Combined Sewer System Costs to Wastewater and Drainage**

Sewer revenue requirements were allocated to wastewater and drainage systems based on the drivers of sewer operating and capital costs. Dry weather treatment and collection costs were allocated to wastewater, while wet weather treatment and distribution costs were allocated to drainage. Direct costs in the Storm Drainage cost center were allocated 50 percent directly to drainage and 50 percent based on the weighted allocation of sewer operating expenses to account for the portion of permitting costs included in this cost center. Indirect or administrative departments were allocated based on the weighted allocation of operating costs to wastewater and drainage. The resulting cost allocations by expense type (excluding bad debt) are shown in Table 4-2. Allocation factors and detailed cost allocations are shown in Schedule 2 and Schedule 4a of Appendix C, respectively.

**Table 4-2: FY 2023 Sewer System Costs Allocated to Wastewater and Drainage (\$M)**

	Wastewater	Drainage	Total
Operating Expenses	\$32.8	\$20.4	\$53.2
Non-Operating Expenses	\$20.9	\$10.6	\$31.5
GLWA Expenses	\$87.5	\$129.8	\$217.3
Revenue Financed Capital	\$0.8	\$0.4	\$1.2
Total Revenue Requirement	\$141.9	\$161.2	\$303.1

## **4.2 ALLOCATION OF WASTEWATER SYSTEM COSTS**

Wastewater revenue requirements were allocated to the following system functions: treatment, collection, meters & service lines, and customer. Meters & service line-related costs are primarily meter operations activities shared by the water and wastewater systems and were allocated based on the proportion of respective accounts. Wastewater accounts are billed based on water meter readings and are responsible for a proportional share.

As a wholesale customer of GLWA, DWSD does not directly monitor industries with higher than domestic strength wastewater;<sup>22</sup> if DWSD were responsible for monitoring and charging customers based on wastewater strength characteristics, additional wastewater system functions would be required for cost allocation purposes. GLWA wholesale treatment costs were allocated directly to treatment, while DWSD operating and debt service costs were allocated to collection, meters and service lines, and customer functions. The wastewater system's share of WRAP expenses was allocated to functions based on the weighted allocation of operating costs. Table 4-3 shows the summary of cost allocations (excluding bad debt) to functions. Allocation factors and detailed cost allocations are shown in Schedule 2 and Schedule 5 of Appendix C, respectively.

**Table 4-3: FY 2023 Wastewater Costs Allocated to Functions (\$M)**

	Treatment	Collection	Meters & Service Lines	Customer	Total
FY 2023 Revenue Requirement (\$M)	\$85.1	\$41.3	\$8.2	\$7.3	\$141.9

Customer counts and billed sewer volume, currently based on billed monthly water use, are used to further allocate wastewater costs to customers. Industry guidelines recognize two primary approaches to allocating wastewater costs: the quantity/quality approach and the surcharge approach. Under the quantity/quality approach, wastewater is measured, and rates are based on the amount of pollutants discharged to the system. With the surcharge approach, all customers are assumed to contribute average domestic strength waste. Those monitored users discharging above a certain limit are assessed a high strength surcharge. DWSD, by way of GLWA's treatment cost recovery policies following the surcharge approach, recovers its wastewater costs uniformly across its customers. The units of service for wastewater cost allocations, therefore, are total accounts billed monthly and total billed volume.

Given DWSD's wastewater service characteristics, the functionalized revenue requirements are simply allocated to two cost components: fixed and volume. Meters & service lines- and customer-related costs are allocated as fixed costs, and treatment- and collection-related costs are allocated as volumetric costs. Table 4-4 presents the FY 2023 wastewater costs by cost component and current units of service.

**Table 4-4: FY 2023 Wastewater Costs Allocated to Cost Components**

	Fixed	Volumetric	Total
FY 2023 Revenue Requirement (\$M)	\$15.5	\$126.4	\$141.9
Units of Service			
Wastewater Accounts	188,993		
FY 2023 Billed Usage (Mcf)		2,403,460	

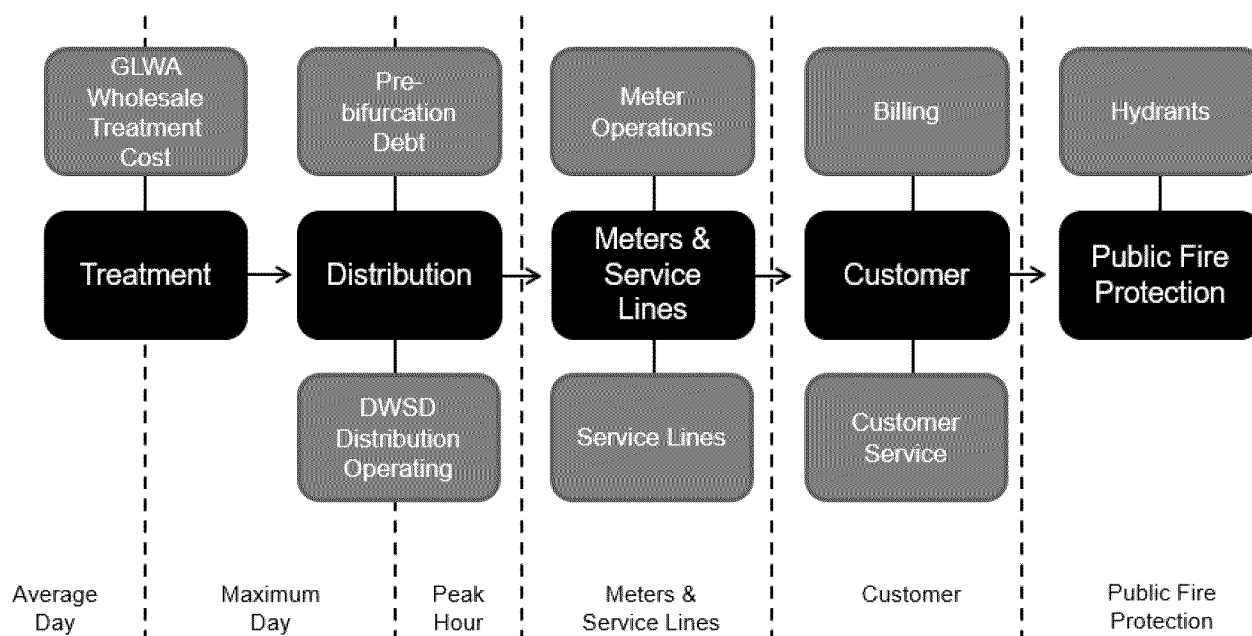
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<sup>22</sup> GLWA imposes an industrial waste control charge to industrial customers. This cost is a pass-through for DWSD.

### 4.3 ALLOCATION OF WATER SYSTEM COSTS

Water revenue requirements were allocated following the AWWA M1 base extra capacity approach, as shown in Figure 4-2. This approach first allocates costs to system functions, then to cost components, and then to customers based on units of service. Figure 4-2 provides a sample of DWSD's revenue requirements cost categories and allocation steps.

**Figure 4-2: Water System Allocation Approach**



As shown in Figure 4-2, GLWA wholesale water treatment costs were allocated directly to the treatment function. DWSD operating expenses such as meter operations, billing, and distribution operations were allocated based on their respective functions. Pre-bifurcation debt service was allocated to the distribution function because pre-bifurcation debt is related to distribution system assets. Expenses related to administration, finance support, and compliance were allocated in proportion to the direct allocation of water operating costs. Table 4-5 shows the summary of cost allocations (excluding bad debt) to water system functions. Allocation factors and detailed cost allocations are shown in Schedule 2 and Schedule 6 of Appendix C, respectively.

**Table 4-5: FY 2023 Water Costs Allocated to Functions (\$M)**

	Treatment	Distribution	Meters & Service Lines	Customer	Public Fire Protection	Total
FY 2023 Revenue Requirements (\$M)	\$23.0	\$89.0	\$8.5	\$6.8	\$0.7	\$128.0

## Allocation of Functions to Cost Components

The next step in the process is the allocation of functional costs to cost components. This step links costs with customer usage and service characteristics that drive those costs and is known as the base/extra-capacity approach for cost allocation. Water system components include average day water demands, maximum day extra capacity demands, peak hour extra capacity demands, meters and service lines, customer, and fire protection. These costs components included in the analysis are standard for a water utility and reflect the different ways a utility provides service and incurs cost. Notably, the Utility makes significant investments in meeting the peak needs of customers where they occur, and when they occur. To serve their customers, utilities such as DWSD are required to plan, install, and maintain water capacity in a manner that provides service reliability. From a cost perspective, the Utility incurs peak-related costs year-round, even if customers only use that peak for short periods during the year. Certain water system functions are sized for and service multiple types of water demands. For these functions, ratios of daily and hourly water demands to measured average annual water demands were applied and used in the allocation process.

Retail system average annual demand (or usage) is based on FY 2021 billing data. Retail system maximum day and peak hour factors are based on a previous study completed for GLWA on units of service for its non-master metered customers<sup>23</sup>. Total system maximum day and peak hour factors are calculated by adding fire flow requirements to retail requirements for average day demands and extra capacity units. GLWA does not have actual average and peaking factors for DWSD because DWSD is a non-master metered community. The information used for this Study are estimates derived from detailed studies conducted by GLWA, which provide the best data for purposes of this analysis.

Fire flow requirements were calculated in this Study based on a detailed review of the City of Detroit Fire Department calls for service data from 2017 through 2021. Actual maximum fire incidents per day and per hour were averaged for structure fires. Schedule 9 of Appendix C shows the maximum number of fires per day and maximum coincident fires, by year for FY 2017 through FY 2021, for residential and non-residential structure fires. The number of fire incidents was averaged over the five-year period. Durations in minutes and fire flow needs in gallons per minute (gpm) for single family and non-single family fires were obtained from Insurance Services Office (ISO) guidelines and ISO fire suppression rating schedules<sup>24</sup>. Service line equivalencies for private fire connections were calculated using the cost of replacing a 5/8" meter and the cost of replacing a service line at the given diameter. The calculation of fireline equivalencies is shown in Schedule 15 of Appendix C.

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<sup>23</sup> Units of Service for Non-Master Metered Customers of Great Lakes Water Authority and System Water Audit, Phase 1 Report and Recommendations, GLWA Project CS-039, Black & Veatch, December 8, 2017.

<sup>24</sup> Insurance Services Office, Inc, Guide for Determination of Needed Fire Flow, Chapter 7, 2014.

Using these data, maximum day and peak hour fire flow units were calculated. Table 4-6 shows the calculation of system units of service and maximum day and peak hour ratios.

**Table 4-6: Calculated DWSD Peaking Ratios**

	Average Day Units	Max Day Units	Peak Hour Units
Mcf per Day	7,089.8	9,506.7	11,245.9
DWSD Coincident Peaking Ratios	1.00	1.34	1.59
Calculated DWSD Fire Flow Requirements	-	794.1	2,887.7
Total with Fire Flow Requirements	7,089.8	10,300.9	14,133.6
Calculated DWSD Peaking Ratios	1.00	1.45	1.99

Table 4-7 shows the M1 approach to allocating functional costs to cost components based on the service provided by each function and associated peaking factors shown in Table 4-6. For example, the treatment function provides average day and maximum day demands. The base portion of those demands is 69%, while the extra maximum day demand portion makes up 31%. Total costs by costs component are determined in this step.

**Table 4-7: Water System Functional Allocations to Cost Components**

	Base Average Day	Extra Max Day	Extra Peak Hour	Meters & Service Lines	Customer	Public Fire Protection	Total (\$M)
Treatment	69%	31%					\$23.0
Distribution	50%	23%	27%				\$89.0
Meters & Service Lines				100%			\$8.5
Customer					100%		\$6.8
Public Fire Protection						100%	\$0.7
Total (\$M)	\$60.5	\$27.4	\$24.1	\$8.5	\$6.8	\$0.7	\$128.0

### Distribution to Customers

All retail customers share in public fire protection-related costs; however, private fire protection customers have separate fire protection service connections and benefit from extra capacity provided by DWSD. In distributing costs to customers, utilities consider customer characteristics and demand patterns.

Customer billing data and data from the City of Detroit Fire Department was used to determine customer characteristics, such as number of customers by meter size, number of public hydrants, billed volume, and fire flow. Table 4-8 shows the units of service for the water system. These units are used to allocate water costs by components to charge types and ultimately customers. Schedule 9 and Schedule 10 of Appendix D show the calculation of DWSD Fire Flow Requirements and Equivalent Fire Units, respectively, used to calculate the public and private fire protection units of service, respectively.

**Table 4-8: Water Units of Service**

	Base Average Day (Mcf/Day)	Extra Max Day (Mcf/Day)	Extra Peak Hour (Mcf/Day)	Equivalent Meters/Service Lines	Bills per Year	Hydrants
Retail	7,090	2,417	1,739	243,907	2,299,762	-
Public Fire	-	743	1,959	-	-	29,948
Private Fire	-	51	135	15,642	21,017	-
Total Units	7,090	3,211	3,833	259,548	2,320,779	29,948

Table 4-9 shows the allocation of cost components from Table 4-7 allocated to service types based on the relative proportion of units of service shown in Table 4-8.

**Table 4-9: Water System Allocation of Cost Components to Services (\$M)**

	Base Average Day	Extra Max Day	Extra Peak Hour	Meters & Service Lines	Customer	Direct Fire Protection	Total
Retail	\$60.5	\$20.6	\$10.9	\$8.0	\$6.8	-	\$106.7
Public Fire	-	\$6.3	\$12.3	-	-	\$0.7	\$19.4
Private Fire	-	\$0.4	\$0.8	\$0.5	\$0.0	-	\$1.9

### Fire Protection Costs

DWSD incurs costs for fire protection both for public and private fire services. All retail customers benefit from the extra capacity in DWSD's system that provides water needed for fire suppression in the community. Such extra capacity improves sufficiency and water pressure and facilitates irrigation. As shown in Table 4-8, private fire protection accounts represent a separate customer class in DWSD's system receiving additional protection. Such connections benefit from on-demand water service that is unlike public service provided to retail customers.

Total fire protection costs include direct costs that are identified by DWSD in its work order management records as maintenance and repair of public fire hydrants. Indirect fire protection costs are related to the extra capacity requirements in DWSD's water system required for fire protection service. Direct fire protection costs are allocated to public fire service because these costs are related to public hydrants. Indirect fire protection costs are calculated and allocated between public and private fire service based on units of service developed in this Study.

Following the base/extra-capacity method for allocating water costs as recommended in AWWA Manual M1, costs were allocated to public and private fire protection customers proportionally based on potential peak use of the system.<sup>25</sup> First, total maximum day and peak hour demands needed for fire suppression

<sup>25</sup> Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, AWWA M1, Seventh Edition, 2017, pages 162 – 163.

within DWSD's system were calculated using maximum fire incidents per day and per hour averaged over a five-year period with required durations and gallons per minute of fire flow given ISO guidelines. The resulting demands in MGD were converted to total fire flow requirements in Mcf.

Next, maximum day and peak hour extra capacity water demands were allocated between public and private fire by proportion of equivalent capacity units. Each hydrant is assumed to be installed on a 6" line. Equivalent private fire connections by line size were determined by calculating the flow capacity equivalents to a 6" fire line size. Once the shares of extra capacity demands were determined for public and private fire services, extra capacity costs were allocated to retail service for the public fire protection portion of costs and to private fire protection service for private fire service costs.

Additionally, costs were allocated to private fire accounts for maintenance of meters and service lines using DWSD's actual installation and materials costs for firelines by size, including the cost of a 5/8" meter used to detect flows through private fire connections. These costs and allocation factors are shown in Schedule 15 of Appendix C. Customer service-related costs were allocated to private fire protection accounts based on 12 annual bills (one per month) sent to each private fireline connection. Public fire service costs are recovered through the water fixed charges as described in Section 5.1.

## 4.4 ALLOCATION OF DRAINAGE SYSTEM COSTS

WEF's manual of stormwater charges<sup>26</sup> describes several reasonable methods for establishing property characteristics used to apply the stormwater charges, including impervious area by parcel, average impervious area, gross area factored by runoff coefficient, class intensity of development, and equivalent hydraulic area. Key considerations for selecting the appropriate method described in the manual are equity and availability of data. During FY 2022, DWSD completed an assessment of impervious acres, which is reported in Table 4-10 (along with the FY 2023 cost of service, excluding bad debt and cost of credits). Billable impervious acres (BIA) compile all types of properties within DWSD's drainage service area subject to stormwater charges (including Detroit Land Bank Authority parcels). The availability of impervious area by parcel provides DWSD the most equitable basis for applying drainage charges and recognizes that impervious area is widely recognized as the largest contributor to runoff.

**Table 4-10: FY 2023 Drainage Costs & Units of Service**

FY 2023	
Revenue Requirement (\$M)	\$161.2
Units of Service	
Billable Impervious Acres (BIA)	26,461

<sup>26</sup> Water Environment Federation, *User-Fee-Funded Stormwater Programs*, Second Edition, 2013.

## 4.5 NON-RATE REVENUE, BAD DEBT, AND DRAINAGE CREDITS

After allocating costs to water, wastewater, and drainage, offsetting non-rate revenues and bad debt were applied in proportion to the cost of service to determine the overall level of revenue requirement from fixed charges, volumetric rates, and drainage charges. Non-rate revenues include miscellaneous sources such as penalties and fees and reduce the revenue required from rates for each system.

Bad debt represents a percentage of retail rate revenues that is not collected by DWSD. Bad debt increases the revenue required from rates. Historically, bad debt varies by customer class, but in general, has been approximately 10% of water and wastewater rate revenues and 18% of drainage revenues. Some of the drainage system bad debt has resulted from the Michigan Department of Transportation (MDOT) disputing the amount of acres for which it was billed and DWSD's interpretation of language in a 1989 Consent Judgment. DWSD has recently reached a settlement of the dispute that will resolve the credits offered MDOT for highway impervious acres and result in an equitable and improved drainage cost recovery from this customer. Schedule 11 of Appendix C shows the detailed allocation of non-rate revenue and bad debt to each utility, function, and class.

Moreover, the drainage revenue requirements also reflect the amount of credits that will be applied to residential, highway drainage, and green credit customers in FY 2023. The drainage credit calculation, based on the calculated rate shown in the following section of this report and the latest BIA data, is shown in Schedule 4 of Appendix D.

## 4.6 RESULTS

The results of the cost allocation analysis for water, wastewater, and drainage are depicted in Figure 4-3. The results demonstrate that current revenues are generally proportional to the rate revenue requirements resulting from the cost-of-service analysis. FY 2023 rate revenues will reflect the cost-of-service allocation results, which represent a \$20 million shift from wastewater to water and a small increase in drainage costs (before credits).

**Figure 4-3: Rate Revenue Requirements vs. Current Revenue by System**

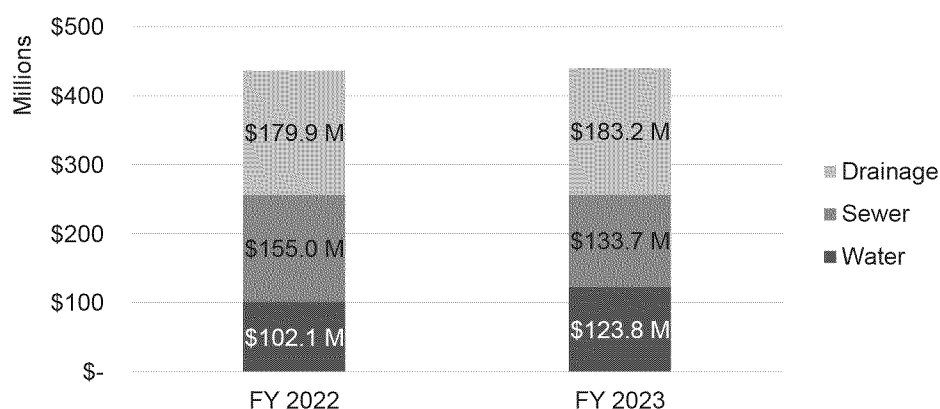
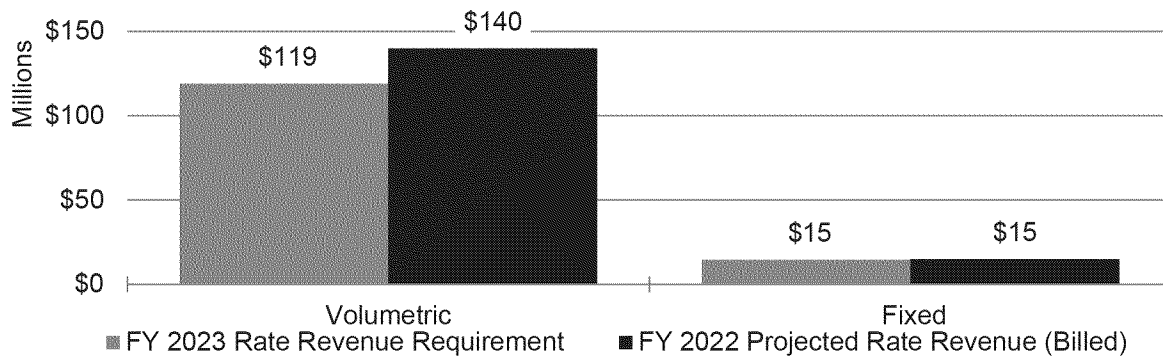
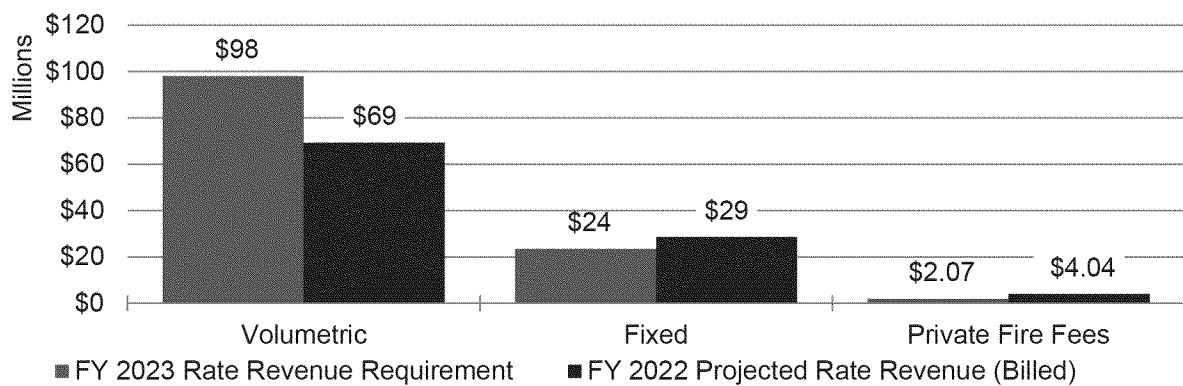


Figure 4-4 and Figure 4-5 show the wastewater and water cost allocation to rate components: wastewater fixed and volumetric charges and water fixed, volumetric, and private fireline charges.

**Figure 4-4: Wastewater Rate Revenue Requirements vs. Current Revenue**



**Figure 4-5: Water Rate Revenue Requirements vs. Current Revenue**

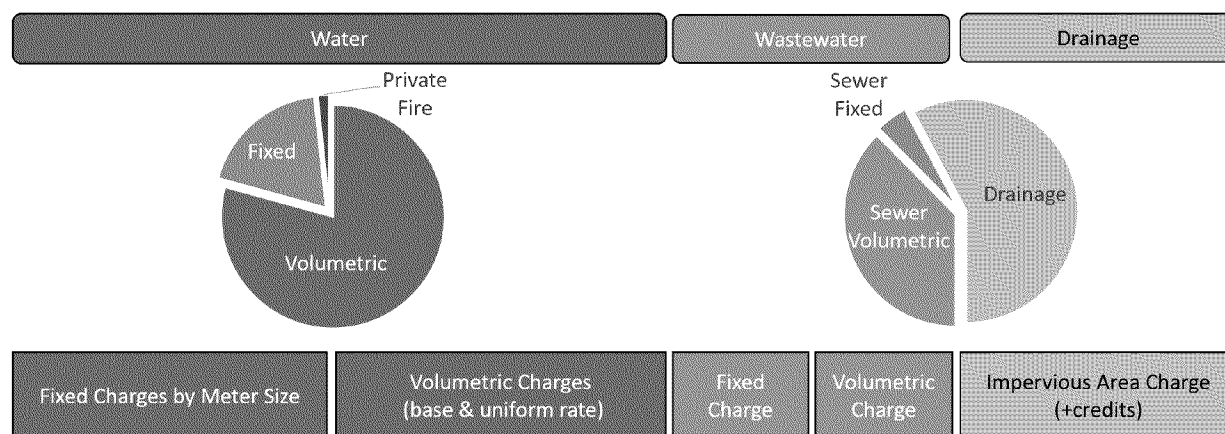


## 5. RATE DESIGN

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, 2) conform to accepted national and local industry best practices, and 3) promote affordability, equity, and conservation.

The cost allocation analysis presented previously connects the specific types of system costs with rate structure components as shown in Figure 5-1.

**Figure 5-1: Rate Design Approach**



The following sub-sections describe the Study's recommended rate structures in more detail.

### 5.1 WATER FIXED CHARGES

Water fixed charges are recommended to recover three types of costs through a monthly meter charge:

- Customer service costs, which are allocated uniformly to all meters.
- Meters and service line costs, which reflect replacement cost by meter size.
- A portion of public fire protection costs (capital, debt, and GLWA expense) that are scaled based on hydraulic capacity of each meter size determined using AWWA M22 Sizing Water Service Lines and Meters<sup>27</sup>.

Figure 5-2 shows the allocation of costs recovered in the recommended 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.

<sup>27</sup> Sizing Water Service Lines and Meters, AWWA M22, Third Edition, 2014.

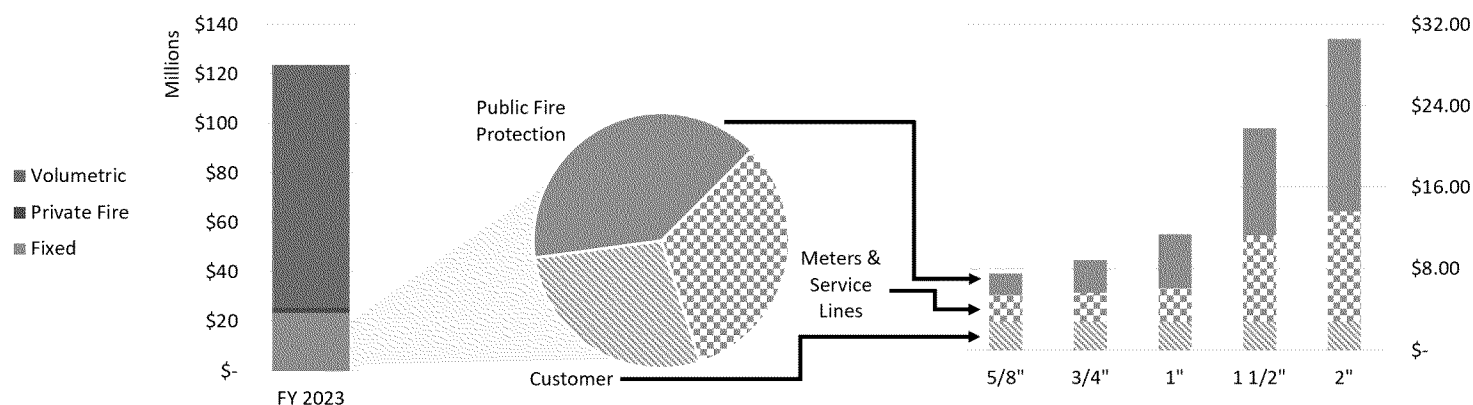
**Figure 5-2: Water Fixed Charge Approach**

Table 5-1 shows the number of meters by meter size, meter equivalency factors by meter size and fixed charge cost type, and the calculation of the charge per equivalent unit by component.

**Table 5-1: Meter Equivalency Factors by Cost Type**

Meter Size	Meter Count	Customer	Meters & Service Lines	Public Fire Protection
Revenue Requirement		\$6,544,251	\$7,688,955	\$9,348,988
5/8"	137,605	1.00	1.00	1.00
3/4"	33,579	1.00	1.09	1.50
1"	11,024	1.00	1.27	2.50
1.5"	2,865	1.00	3.22	5.00
2"	2,720	1.00	4.12	8.00
3"	672	1.00	14.92	25.50
4"	539	1.00	17.07	46.00
6"	269	1.00	26.07	140.00
8"	85	1.00	37.16	185.00
10"	38	1.00	66.58	352.25
12"	4	1.00	98.00	550.40
14"	0	1.00	144.27	880.65
16"	1	1.00	212.37	1,144.85
Equivalent Meters		191,647	243,907	367,978
Charge per Equivalent per Month		\$2.85	\$2.63	\$2.12

The current and proposed monthly water meter charges are shown in Table 5-2.

**Table 5-2: 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

Private fireline charges are calculated based on the private fireline revenue requirement from the cost allocation process and equivalent fireline connection size. A 6-inch fireline is considered the base size against which other sizes are compared. Equivalent connection size equivalencies are calculated based on the Hazen-Williams formula that relates the capacity of flow in a pipe to its inside diameter<sup>28</sup>.

Table 5-3 shows the number of fireline connections by connection size and connection equivalency factors used for calculating private fireline charges by size.

**Table 5-3: Summary of Connections & Equivalency Factors**

Connection Size	Connection Count	Connection Equivalency (Hazen Williams)
4"	614	0.34
6"	607	1.00
8"	428	2.13
10"	40	3.83
12"	20	6.19

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<sup>28</sup> The Hazen-Williams equation determines relative flow potential for service connections by raising the diameter of the pipe to the 2.63 power. Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, AWWA M1, Seventh Edition, 2017, page 163.

Table 5-4 shows the current and proposed private fireline charges based on the private fireline cost allocation and connection equivalency factors in Table 5-3.

**Table 5-4: Summary of Current and Proposed Private Fireline Charges**

Connection 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

## 5.2 WATER VOLUMETRIC RATES

DWSD's current water volumetric rate is applied uniformly to all water use. Water rate structures vary widely in the industry; uniform volume rates are becoming less common as water conservation and affordability of water service become priority pricing objectives. As part of the Study, an alternative approach was evaluated that is based on cost of service principles that had the added benefit of improving the affordability of DWSD's water bills for lower volume users and providing a price incentive for conservation for higher volume users.

A two-tiered volumetric rate structure was determined to meet DWSD's objectives of a simple, equitable, and affordable water rate structure for retail water service to its customers. The tiered structure offers a lower rate per Mcf to all customers up to a certain threshold of monthly water use. Usage during the month that exceeds the threshold is charged at a higher rate. Such an approach incentivizes customers to monitor monthly water use and provides an incentive to reduce water use within the first-tier threshold. This structure also provides lower bills to all low volume water users, regardless of income.

A summary of the approach follows. Fundamentally, the recommended water volumetric rates will recover other water system costs not covered in the fixed charges from a two-tiered structure.

- Base tier threshold of 0.6 thousand cubic feet (Mcf) per month was calculated based on estimated indoor residential water use<sup>29</sup> and substantiated based on a review of DWSD FY 2021 monthly billed volume distributions.

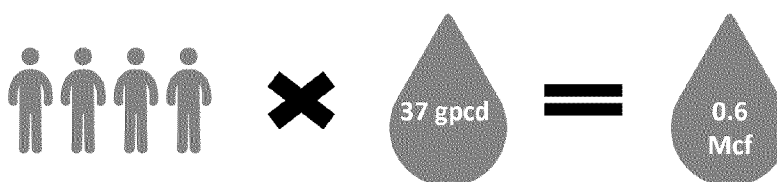
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<sup>29</sup> Assumes four people per household and 36.7 gallons per capita per day based on *Residential End Uses of Water, Version 2*, The Water Research Foundation, 2016. Monthly usage calculates to be 4,040 gallons, or 0.6 Mcf.

- Base tier rate was calculated by dividing average day costs by total usage volume, plus Tier 1 peaking costs<sup>30</sup>, divided by Tier 1 volume. The base tier structure applies to all customers 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 divided by Tier 2 volume. The higher tier reflects allocation of costs to the water users who impose increased burden on the system due to peak demand.

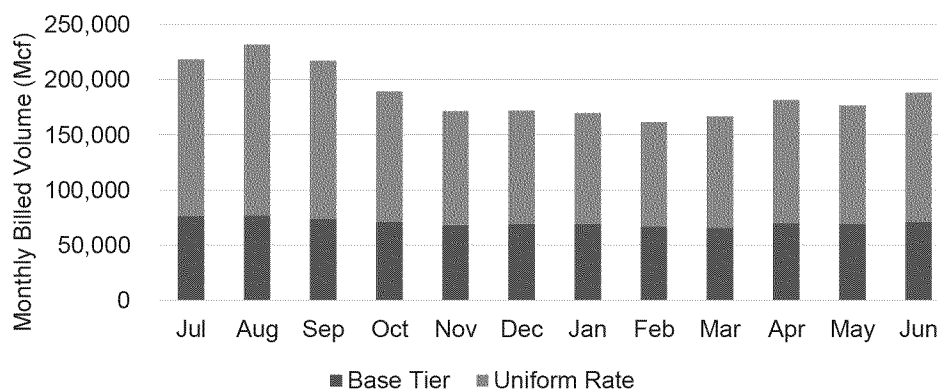
Figure 5-3 shows the calculation for the base tier size of 0.6 Mcf per month. Although this calculation is conceptually based on a residential profile of efficient indoor water use, it is applied to all retail customers.

**Figure 5-3: Base Tier Size Analysis**



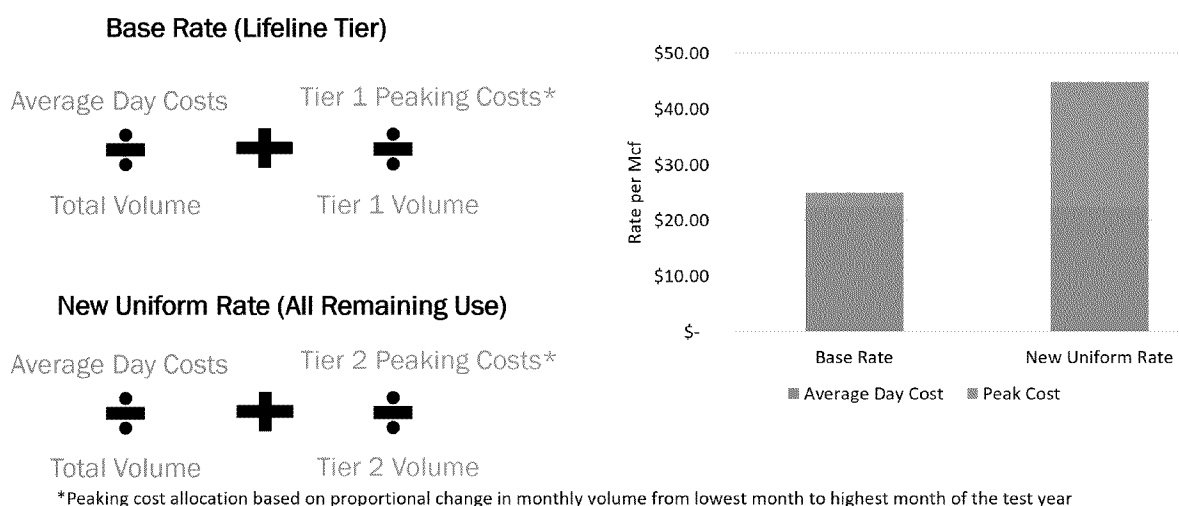
The following Figure 5-4 shows the resulting volume in each tier by month, based on 2021 billing data for all retail customers. The chart demonstrates that there is minimal peaking in the base tier because the amount of water use stays consistent throughout the year. The water system incurs additional costs to meet peak demands; therefore, allocating peak costs to proportionally to the tiers results in peak-related costs being paid by the customers who contribute to increasing peak demands.

**Figure 5-4: Amount of Water Use that Falls in Each Tier**



The following Figure 5-5 shows the calculation of the base rate and new uniform rate as well as the resulting rate per Mcf of the base tier and new uniform tier.

<sup>30</sup> Peaking cost allocation between the tiers reflects the proportional change in monthly volume from lowest month to highest month for each tier based on DWSD FY 2021 billing data.

**Figure 5-5: Water Volumetric Rates Pricing Analysis**

The current and proposed water volumetric rates are shown in Table 5-5.

**Table 5-5: 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 (0-0.6 Mcf)	\$25.04
		Uniform Tier (>0.6 Mcf)	\$44.92

### 5.3 WASTEWATER FIXED CHARGES AND VOLUMETRIC RATES

Wastewater costs are recovered through a monthly customer charge and volumetric rate. Currently, the uniform volumetric rate is applied to each customer's monthly billed water usage to determine the volume component of the sewer bill. While this is not a unique practice within the wastewater industry, utilities will often make allowances for seasonal water demands such as outdoor irrigation that likely does not return to the wastewater system.

Alternative approaches to billing for total water use include average winter water consumption calculations for each customer that serve as the basis for sewer bills in the summer months. Implementation of a sewer cap on water usage for residential customers is another approach used in the industry. Applying a cap is appropriate for residential customers that have relatively homogeneous usage profiles, compared to the wide variability of usage in commercial customers that makes a uniform cap amount problematic. Moreover, many commercial customers will have separate metering configurations for water only demands. Regardless, both approaches better approximate actual water usage that returns through the wastewater system.

A summary of the recommended rate structure for wastewater is as follows.

1. Recover wastewater customer-related costs through a fixed monthly charge that applies equally to each customer bill.<sup>31</sup>
2. Proposed volumetric rate approach uses each customer's monthly average winter consumption (AWC) or actual water use, whichever is lower, as the basis for billing the volumetric rate.
  - a. AWC is based on average water use from January through March.
  - b. AWC is applied to all customer classifications.
3. Interim wastewater volumetric rate approach applies monthly cap of 1.2 Mcf on individually metered residential units.
  - a. Continue using billed monthly water use for all other customers.
  - b. Use until AWC can be implemented in billing system (FY 2024).

The current and proposed wastewater service charges are shown in Table 5-6.

**Table 5-6: Summary of Current and Proposed Wastewater Service Charge**

	<b>Current Charge (per bill)</b>	<b>Proposed Charge (per bill)</b>
All Customers	\$6.54	\$6.34

The current and proposed wastewater volumetric rates are shown in Table 5-7.

**Table 5-7: Summary of Current and Proposed Sewer Volumetric Rates**

	<b>Current Volumetric Rate (per Mcf)</b>	<b>Proposed Volumetric Rate (per Mcf)</b>
All Use	\$57.06	\$55.40

## 5.4 DRAINAGE CHARGES

The drainage charge was calculated based on the cost-of-service results, which incorporate credits, and the latest available billed impervious area (BIA) data. DWSD offers drainage charge or user fee credits to qualifying customers. The credits are ongoing reductions in the customer's drainage charge based on the demonstration of stormwater management practices that provide DWSD with a cost savings that DWSD would otherwise incur as part of their efforts to manage drainage runoff. Credits are a key component of DWSD's stormwater program as they provide the customer with the ability to voluntarily reduce or control

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<sup>31</sup> Wastewater customer costs include meters and service line-related costs, allocated proportionally to water and wastewater based on customer bills. While water meters and service line-related costs were scaled in fixed charges based on meter and service line replacement costs by water meter/service line size, DWSD currently charges sewer fixed costs per customer and does not scale based on water meter/service line size. DWSD may want to consider scaling wastewater fixed charges based on meter size in a future analysis.

their use of the stormwater system, which is a key component of user fees. Additionally, credits provide an incentive for customers to proactively manage stormwater on their property, thus encouraging effective stormwater management within DWSD and reducing the burden on the drainage system. The credit calculation is shown in Schedule 4 of Appendix D.

The current and proposed drainage charges per impervious acre are shown in Table 5-8.

**Table 5-8: Summary of Current and Proposed Drainage Charges**

	<b>Current Charge (per month per impervious acreage)</b>	<b>Proposed Charge (per month per impervious acreage)</b>
All Customers	\$677.00	\$678.28

### **Public Rights of Way (ROW)**

Public rights-of-way (ROW) serve as vital components of the DWSD drainage system. ROW include streets, curbs and inlets, and other parcels of land that allow for buried drainage infrastructure. Without these key assets DWSD would be required to develop alternative infrastructure to convey runoff and therefore the ROW are considered integral to the drainage conveyance network. It is important to take these benefits into account as part of the drainage rate calculations. Stantec used two approaches to evaluate the net benefits associated with the role of public ROW in the management of drainage within DWSD.

The first approach is based on the cost of providing drainage service to ROW compared to the cost of acquiring the ROW easements. The first step in determining the cost of providing drainage service is to establish the drainage rate if ROW impervious area were included. DWSD has an estimated 15,872 acres of public ROW not currently included in its drainage charge calculation. The updated drainage charge per impervious acre was then applied to these total ROW acres to establish the cost of providing drainage service per year.

The benefit of ROW was evaluated based on the value of the easements needed to convey DWSD's stormwater. The calculation is based on a range of costs per square foot of vacant land within the City of Detroit,<sup>32</sup> the miles of system in the public ROW, and a 6.00% rate of return. The resulting cost reflects a range of credits that could be applied to the ROW if a drainage charge was applied. The analysis found that the credits would be higher than the revenue received from the ROW, based on the above drainage cost evaluation. The detailed analysis is presented in Schedule 5 of Appendix D.

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<sup>32</sup> CDM Smith, *Expert Report of John A. Aldrich In the Matter of Binns et al. v City of Detroit DAART et al. v. City of Detroit Wayne County Circuit Court Case No. 21-009013-PZ (on referral from Michigan Court of Appeals Case No. 337609 and Case No. 339176)*, April 8, 2022.

The second approach evaluated the cost of public ROW to the drainage system by estimating the public ROW wet weather flow contributed to DWSD's system. Total ROW impervious area in DWSD's drainage area was estimated based on similar studies' experience in acres of impervious area contributing runoff. Cost per million gallons per day (MGD) of wet weather flow was applied to ROW's contributed flow to estimate the cost.

Benefits that public ROW provide to DWSD's drainage system were calculated again using wet weather flow. For conveyance benefits, estimates of impervious acres for which ROW convey stormwater runoff were calculated. Cost per MGD was applied to the wet weather flow conveyed by ROW. When benefits were compared to costs, the net benefit of ROW was positive, indicating the value provided by the public ROW exceeds the drainage costs attributable to the ROW. The detailed analysis is presented in Schedule 5 of Appendix D.

Based on both analyses, which demonstrate that the benefit of having ROW is higher than the cost, it is not recommended to add public ROW to the drainage charge system.

## 5.5 CUSTOMER BILL IMPACTS

Table 5-9 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, cost-of-service adjustments, and rate structure modifications recommended herein.

**Table 5-9: Single Family Combined Water, Wastewater, and Drainage Bill (5/8" Meter)**

Water Use (Mcf)	Percentage of Bills	Current Bill	Calculated Bill	\$ Change	% Change
0.0	11%	\$39.79	\$39.37	-\$0.42	-1.1%
0.1	19%	\$48.15	\$47.41	-\$0.74	-1.5%
0.2	31%	\$56.52	\$55.45	-\$1.07	-1.9%
0.3	43%	\$64.89	\$63.50	-\$1.39	-2.1%
0.4	54%	\$73.25	\$71.54	-\$1.71	-2.3%
0.5	64%	\$81.62	\$79.59	-\$2.03	-2.5%
0.6	72%	\$89.98	\$87.63	-\$2.35	-2.6%
0.7	78%	\$98.35	\$97.66	-\$0.69	-0.7%
0.8	83%	\$106.72	\$107.69	\$0.97	0.9%
0.9	86%	\$115.08	\$117.73	\$2.65	2.3%
1.0	89%	\$123.45	\$127.76	\$4.31	3.5%
1.1	91%	\$131.81	\$137.79	\$5.98	4.5%
1.2	92%	\$140.18	\$147.82	\$7.64	5.5%
1.3	94%	\$148.55	\$152.31	\$3.76	2.5%

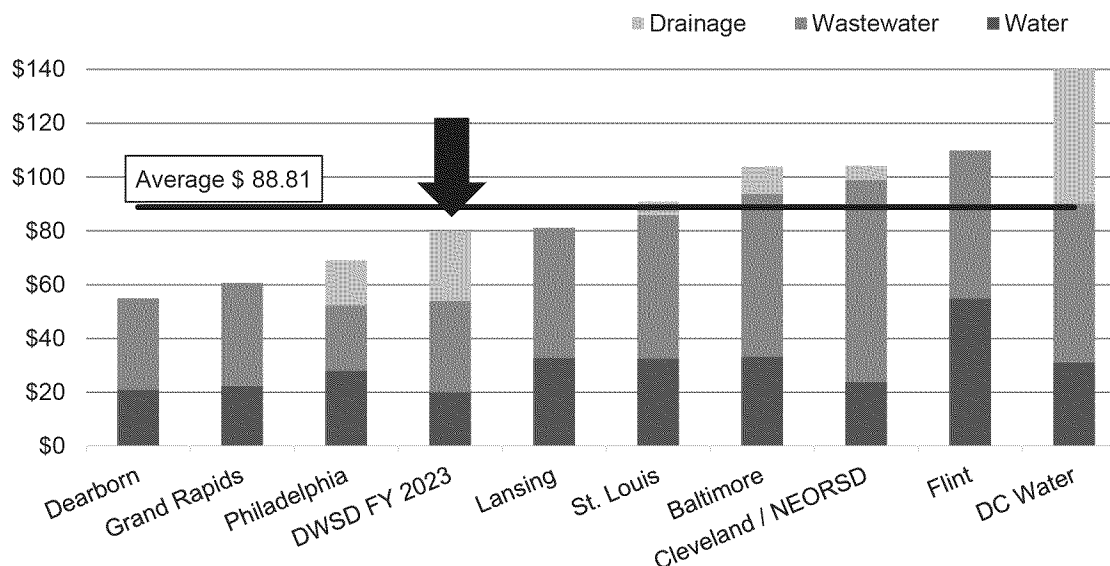
Note:

1. Proposed bill reflects water, wastewater, and drainage FY 2023 revenue requirements.
2. Proposed bill reflects water rate structure changes and wastewater volumetric rate cap of 1.2 Mcf.

- Assumes 0.05 billable impervious acres for drainage portion of bill.

Stantec prepared a survey of monthly residential bills for local and national peers. Figure 5-6 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 \$79.59 per month is lower than the average bill of \$88.81 per month.

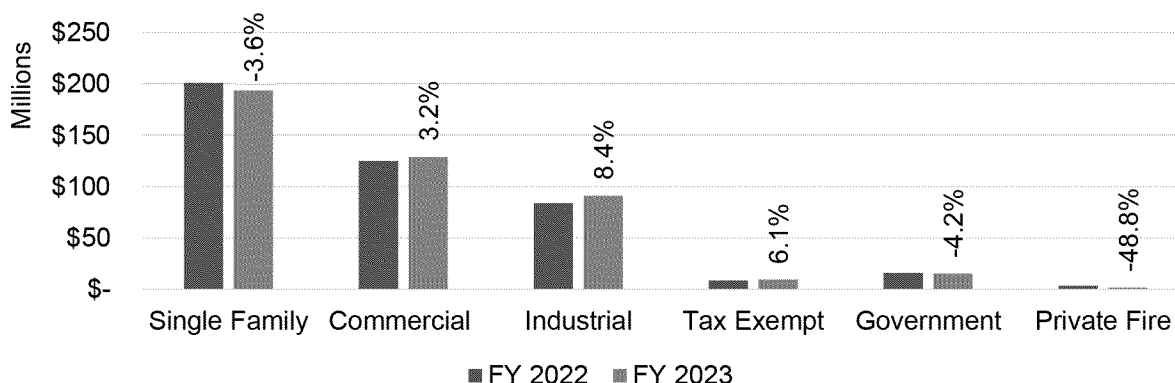
**Figure 5-6: Monthly Residential Bill Comparison**



**Notes:**

- "DWSD FY 2023" reflects water, wastewater, and drainage FY 2023 revenue requirements and proposed rates.
- Assumes 5/8" meter, 0.5 Mcf of water use, and 0.05 billable impervious acres.
- Agencies without a drainage fee may capture costs in water/sewer charges or in non-utility sources (i.e., taxes).
- 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 5-9 and Figure 5-6, non-residential customers will have varying impacts based on each customer's meter size, monthly water volume, and impervious area. Figure 5-7 shows a summary of revenue impacts aggregated for various customer classifications based on FY 2023 rates (assuming AWC for wastewater billing) and customer billing data. Generally, the range of impact is dependent upon the amount and distribution of monthly water use of individual customers within each classification as this will impact how much water is billed in each tier of the proposed water rate structure as well as how much volume is billed wastewater volumetric charges.

**Figure 5-7: FY 2023 Estimated Change in Revenue by Customer Class**

## 5.6 AFFORDABILITY

Affordability of service is important to DWSD and effective August 1, 2022, customer assistance to qualifying customers is provided through GLWA's Water Rate Assistance Program (WRAP) funding and Federal Low Income Household Water Assistance Program (LIHWAP)<sup>33</sup> funding. DWSD administers program funds through its pilot Lifeline Affordability Plan. The Lifeline Plan was created by DWSD to provide low-income customers with non-rate revenue funds from WRAP and LIHWAP to help cover their bills. . While the shut-off moratorium ended in the State March 31, 2021, the City of Detroit and DWSD extended the moratorium through 2022<sup>34</sup>. The Lifeline Plan offers qualifying residential customers a fixed monthly bill for the first 4,500 gallons of water, pays off arrearages, and offers plumbing repairs at households using more than 4,500 gallons of water per month. In the Lifeline Plan, there are three payment tiers: \$18/month for water, sewer, and drainage bill if household income is at or below 135% of Federal Poverty Level; \$43/month if household income is above 135% of FPL but at or below 150% of FPL; and \$56/month if household income is above 150% of FPL but at or below 200% of FPL. The gap amount between the Lifeline Plan payment and actual bill are paid with WRAP and LIHWAP dollars. DWSD continues to review the use of outside funding sources and is actively lobbying for continued funding under LIHWAP appropriation to assist its neighbors in need, as current LIHWAP program will end in September 2023.

<sup>33</sup> The LIHWAP program and provides up to \$1,000 in assistance to low-income customers with disconnected services or those facing disconnection. Low Income Household Water Assistance Program, Michigan LIHWAP Profile Summary, RPT\_LIHWAP\_Profile Summary\_MI\_FY2022 (hhs.gov).

<sup>34</sup> <https://detroitmi.gov/news/mayor-dwsd-extend-moratorium-residential-water-shutoffs-through-2022-and-announce-intention>

## 6. FINDINGS & RECOMMENDATIONS

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

1. FY 2023 rate adjustments reflect the results of the cost allocation analysis that rebalance revenue needed from each system. The total revenue increase needed from FY 2022 to FY 2023 is 0.8 percent.
2. FY 2023 cost allocation of revenue requirements results in a \$20 million shift in costs from wastewater to water from FY 2022 revenues based on a detailed allocation of operating and capital costs reflecting current and planned activities.
3. Water rate structure revised to apply base rate to water use that is consistent throughout the year and allocate peaking costs to the base rate and a new uniform rate in proportion to the contribution to the peak demands on the system from use in each tier.
4. Wastewater rate structure revised to bill volumetric rate based on the lesser of actual water use or average winter consumption, calculated based on January through March water use by FY 2024.
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 individually metered residential customers and bill actual water use for all other 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. Update rate revenue requirements annually and perform periodic rate studies (every 3 to 5 years) to address changes in cost distributions between services and customer characteristics.

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## APPENDIX A: WATER REVENUE REQUIREMENTS SUPPORTING SCHEDULES

Schedule 1: Assumptions

	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
<b><u>Rate Increase Adoption Date</u></b>	7/1/2022	7/1/2023	7/1/2024	7/1/2025	7/1/2026	7/1/2027	7/1/2028	7/1/2029	7/1/2030	7/1/2031
<b><u>Annual Growth</u></b> <sup>1</sup>										
Ending Number of Equivalent Meters	304,944	306,468	308,001	309,541	311,088	312,644	314,207	315,778	317,357	318,944
% Change in Equivalent Meters	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Total Usage (Mcf)	2,558,087	2,506,925	2,456,787	2,407,651	2,359,498	2,312,308	2,266,062	2,220,741	2,176,326	2,132,799
% Change in Usage	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%
<b><u>Capital Spending</u></b> <sup>2</sup>										
Annual Capital Plan (Future Year Dollars)	\$ 49,493,280	\$ 50,094,304	\$ 51,709,998	\$ 57,287,974	\$ 50,000,000	\$ 50,000,000	\$ 50,000,000	\$ 50,000,000	\$ 50,000,000	\$ 50,000,000
<b><u>Average Annual Interest Earnings Rate</u></b> <sup>3</sup>										
On Fund Balances	0.00%	0.25%	0.50%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%
<b><u>Operating Budget Reserve</u></b> <sup>4</sup>										
Target (Number of Months of Reserve)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
<b><u>Operating Budget Execution Percentage</u></b>										
Personnel Services	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Operations and Maintenance	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

<sup>1</sup> Current and projected equivalent meters and usage based on DWSD forecast model used to prepare FY 2023 Adopted Budget.

<sup>2</sup> Capital spending from FY 2023 through FY 2027 reflects 2023 5-Year CIP Plan BOWC Approved with annual execution factors. Future CIP reflects estimated levels of spending.

<sup>3</sup> Annual interest earnings on fund balances reflect staff estimates. FY 2023 reflects FY 2023 Adopted Budget level of \$0 interest earnings.

<sup>4</sup> Recommended Revenue Fund reserve level of three months of operating expenses.

Schedule 2: Beginning Balances

Water Beginning Balances as of June 30, 2022 <sup>1</sup>	Revenue Fund	Bond Proceeds	Improvement & Extension
<b>Available Fund Balance</b>	\$ 26,487,000	\$ 45,113,000	\$ 77,764,000

<sup>1</sup> Unaudited cash balances provided by DWSD staff.

Schedule 3: Cash In

	FY 2023 <sup>1</sup>	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
<b>Rate Revenue Growth Assumptions</b>										
1 % Change in Equivalent Meters	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
2 % Change in Usage	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%	-2.00%
<b>Assumed Rate Revenue Increases</b>										
3 Assumed Water Rate Increase	21.32%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
<b>Water Rate Revenue</b>										
4 Base Rate Revenue	\$ 39,623,565	\$ 41,414,550	\$ 43,286,487	\$ 45,243,037	\$ 47,288,022	\$ 49,425,440	\$ 51,659,470	\$ 53,994,478	\$ 56,435,029	\$ 58,985,892
5 Usage Rate Revenue	84,142,818	85,758,361	87,404,921	89,083,096	90,793,491	92,536,726	94,313,431	96,124,249	97,969,835	99,850,856
6 <b>Total Water Rate Revenue</b>	<b>\$ 123,766,383</b>	<b>\$ 127,172,910</b>	<b>\$ 130,691,409</b>	<b>\$ 134,326,132</b>	<b>\$ 138,081,513</b>	<b>\$ 141,962,167</b>	<b>\$ 145,972,902</b>	<b>\$ 150,118,728</b>	<b>\$ 154,404,864</b>	<b>\$ 158,836,748</b>
<b>Other Operating Revenue</b>										
7 447220-Water Other Fees	\$ 2,900,760	\$ 2,900,760	\$ 2,900,760	\$ 2,900,760	\$ 2,900,760	\$ 2,900,760	\$ 2,900,760	\$ 2,900,760	\$ 2,900,760	\$ 2,900,760
8 474100-Miscellaneous Receipts	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
9 <b>Total Other Operating Revenue</b>	<b>\$ 3,900,760</b>	<b>\$ 3,900,760</b>	<b>\$ 3,900,760</b>	<b>\$ 3,900,760</b>	<b>\$ 3,900,760</b>	<b>\$ 3,900,760</b>	<b>\$ 3,900,760</b>	<b>\$ 3,900,760</b>	<b>\$ 3,900,760</b>	<b>\$ 3,900,760</b>
<b>Non-Operating Revenue</b>										
10 471903-Shared Services Revenue	\$ 750,000	\$ 750,000	\$ 750,000	\$ 750,000	\$ 750,000	\$ 750,000	\$ 750,000	\$ 750,000	\$ 750,000	\$ 750,000
11 472150-Other Miscellaneous <sup>2</sup>	12,316,300	3,675,508	4,453,309	4,422,197	4,247,403	4,106,706	4,075,594	4,044,482	4,013,370	3,982,258
12 <b>Total Non-Operating Revenue</b>	<b>\$ 13,066,300</b>	<b>\$ 4,425,508</b>	<b>\$ 5,203,309</b>	<b>\$ 5,172,197</b>	<b>\$ 4,997,403</b>	<b>\$ 4,856,706</b>	<b>\$ 4,825,594</b>	<b>\$ 4,794,482</b>	<b>\$ 4,763,370</b>	<b>\$ 4,732,258</b>
<b>Interest Income</b>										
13 Unrestricted	\$ -	\$ 214,878	\$ 378,345	\$ 533,284	\$ 531,165	\$ 531,165	\$ 531,165	\$ 531,165	\$ 531,165	\$ 531,165
14 <b>Total Interest Income</b>	<b>\$ -</b>	<b>\$ 214,878</b>	<b>\$ 378,345</b>	<b>\$ 533,284</b>	<b>\$ 531,165</b>	<b>\$ 531,165</b>	<b>\$ 531,165</b>	<b>\$ 531,165</b>	<b>\$ 531,165</b>	<b>\$ 531,165</b>
15 <b>Total Cash Inflows</b>	<b>\$ 140,733,443</b>	<b>\$ 135,714,056</b>	<b>\$ 140,173,823</b>	<b>\$ 143,932,373</b>	<b>\$ 147,510,841</b>	<b>\$ 151,250,797</b>	<b>\$ 155,230,420</b>	<b>\$ 159,345,134</b>	<b>\$ 163,600,158</b>	<b>\$ 168,000,930</b>

<sup>1</sup> FY 2023 based on results of cost allocation analysis.

<sup>2</sup> Other Miscellaneous forecast based on pension expenses reimbursable by GLWA.

Schedule 4: Cash Out

Object Description	Cost Center	FY 2023 <sup>1</sup>	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
1 601100-Salar-Full Time-Gen City	481001	\$ 296,981	\$ 304,406	\$ 312,016	\$ 319,816	\$ 327,812	\$ 336,007	\$ 344,407	\$ 353,017	\$ 361,843	\$ 370,889
2 601115-Salaries-Contractual	481001	132,175	135,479	138,866	142,338	145,896	149,544	153,282	157,114	161,042	165,068
3 602100-Wages-Full Time-Gen City	481001	16,481	16,893	17,315	17,748	18,192	18,646	19,112	19,590	20,080	20,582
4 603125-Emplr Pd Pension-GRS	481001	22,272	22,829	23,400	23,985	24,585	25,199	25,829	26,475	27,137	27,815
5 603200-Emplr Pd Ben-Medical	481001	54,480	56,659	58,926	61,283	63,734	66,284	68,935	71,692	74,560	77,542
6 603300-Employer Pd FICA	481001	34,091	35,455	36,873	38,348	39,882	41,477	43,136	44,862	46,656	48,523
7 603400-Unemployment	481001	4,379	4,489	4,601	4,716	4,834	4,955	5,078	5,205	5,336	5,469
8 603405-Workers' Compensation	481001	26,181	26,835	27,506	28,194	28,899	29,621	30,362	31,121	31,899	32,696
9 603900-Emp Benefits-Miscellaneous	481001	1,789	1,834	1,890	1,927	1,975	2,024	2,075	2,127	2,180	2,235
10 604100-Other Comp-Unused Sick Leave	481001	424	434	445	456	468	479	491	504	516	529
11 605100-Group Life Insurance	481001	1,130	1,175	1,222	1,271	1,322	1,375	1,430	1,487	1,547	1,608
12 605205-Eye Care-Active Civilian	481001	753	784	815	847	881	917	953	991	1,031	1,072
13 605500 - Income Protection	481001	1,224	1,273	1,324	1,377	1,432	1,490	1,549	1,611	1,676	1,743
14 605620-Dental Active	481001	2,872	2,987	3,107	3,231	3,360	3,495	3,634	3,780	3,931	4,088
15 605700-Health Care Reserve - Civilian	481001	8,947	9,304	9,677	10,064	10,466	10,885	11,320	11,773	12,244	12,734
16 620100-Office Supplies	481001	4,709	4,826	4,947	5,071	5,198	5,328	5,461	5,597	5,737	5,881
17 621900-Oper Supplies-Miscellaneous	481001	1,413	1,448	1,484	1,521	1,559	1,598	1,638	1,679	1,721	1,764
18 626300-Insurance Premium	481001	97,142	99,570	102,059	104,611	107,226	109,907	112,654	115,471	118,358	121,317
19 626500-Dues & Miscellaneous	481001	82,874	84,946	87,070	89,246	91,477	93,764	96,108	98,511	100,974	103,498
20 626600-Postage	481001	283	290	297	304	312	320	328	336	344	353
21 627230-Employee Parking	481001	4,520	4,633	4,749	4,868	4,990	5,114	5,242	5,373	5,508	5,645
22 628100-Travel	481001	7,204	7,385	7,569	7,758	7,952	8,151	8,355	8,564	8,778	8,997
23 601100-Salar-Full Time-Gen City	481601	29,053	29,779	30,524	31,287	32,069	32,871	33,693	34,535	35,398	36,283
24 603125-Emplr Pd Pension-GRS	481601	1,460	1,496	1,534	1,572	1,611	1,652	1,693	1,735	1,779	1,823
25 603200-Emplr Pd Ben-Medical	481601	3,579	3,722	3,871	4,025	4,187	4,354	4,528	4,709	4,898	5,094
26 603300-Employer Pd FICA	481601	2,213	2,302	2,394	2,489	2,589	2,693	2,800	2,912	3,029	3,150
27 603400-Unemployment	481601	283	290	297	304	312	320	328	336	344	353
28 603405-Workers' Compensation	481601	1,695	1,738	1,781	1,825	1,871	1,918	1,966	2,015	2,065	2,117
29 603900-Emp Benefits-Miscellaneous	481601	141	145	148	152	156	160	164	168	172	176
30 605100-Group Life Insurance	481601	47	49	51	53	55	57	60	62	64	67
31 605205-Eye Care-Active Civilian	481601	47	49	51	53	55	57	60	62	64	67
32 605500-Income Protection-LTD	481601	47	49	51	53	55	57	60	62	64	67
33 605620-Dental Active	481601	188	196	204	212	220	229	238	248	258	268
34 605700-Health Care Reserve - Civilian	481601	612	637	662	689	716	745	775	806	838	871
35 620100-Office Supplies	481601	4,709	4,826	4,947	5,071	5,198	5,328	5,461	5,597	5,737	5,881
36 621900-Oper Supplies-Miscellaneous	481601	1,413	1,448	1,484	1,521	1,559	1,598	1,638	1,679	1,721	1,764
37 626300-Insurance Premium	481601	91,727	94,020	96,370	98,779	101,249	103,780	106,375	109,034	111,760	114,554
38 626500-Dues & Miscellaneous	481601	4,332	4,440	4,551	4,665	4,782	4,901	5,024	5,149	5,278	5,410
39 626600-Postage	481601	283	290	297	304	312	320	328	336	344	353
40 628100-Travel	481601	26,652	27,318	28,001	28,701	29,418	30,154	30,908	31,680	32,472	33,284
41 601100-Salar-Full Time-Gen City	482401	325,590	333,729	342,073	350,624	359,390	368,375	377,584	387,024	396,699	406,617
42 603125-Emplr Pd Pension-GRS	482401	16,285	16,692	17,109	17,537	17,975	18,425	18,885	19,357	19,841	20,337
43 603200-Emplr Pd Ben-Medical	482401	39,760	41,351	43,005	44,725	46,514	48,374	50,309	52,322	54,415	56,591
44 603300-Employer Pd FICA	482401	24,903	25,899	26,935	28,012	29,133	30,298	31,510	32,771	34,081	35,445
45 603400-Unemployment	482401	3,172	3,252	3,333	3,416	3,502	3,589	3,679	3,771	3,865	3,962
46 603405-Workers' Compensation	482401	19,140	19,618	20,109	20,612	21,127	21,655	22,196	22,751	23,320	23,903
47 603900-Emp Benefits-Miscellaneous	482401	1,322	1,355	1,389	1,423	1,459	1,496	1,533	1,571	1,611	1,651
48 604100-Other Comp-Unused Sick Leave	482401	264	271	278	285	292	299	307	314	322	330
49 605100-Group Life Insurance	482401	846	880	915	952	990	1,029	1,070	1,113	1,158	1,204
50 605205-Eye Care-Active Civilian	482401	529	550	572	595	619	643	669	696	724	753
51 605500-Income Protection-LTD	482401	899	935	972	1,011	1,052	1,094	1,137	1,183	1,230	1,279
52 605620-Dental Active	482401	2,115	2,200	2,287	2,379	2,474	2,573	2,676	2,783	2,894	3,010
53 605700-Health Care Reserve - Civilian	482401	6,503	6,763	7,034	7,315	7,608	7,912	8,229	8,558	8,900	9,256
54 616100-Consultant Fees-Mgt Consult	482401	185,054	189,681	194,423	199,283	204,265	209,372	214,606	219,971	225,471	231,107
55 617900-Contract Svcs-Other-Misc	482401	105,745	108,389	111,099	113,876	116,723	119,641	122,632	125,698	128,840	132,061
56 620100-Office Supplies	482401	2,644	2,710	2,777	2,847	2,918	2,991	3,066	3,142	3,221	3,302
57 621900-Oper Supplies-Miscellaneous	482401	7,931	8,129	8,332	8,541	8,754	8,973	9,197	9,427	9,663	9,905
58 626500-Dues & Miscellaneous	482401	15,862	16,258	16,665	17,081	17,508	17,946	18,395	18,855	19,326	19,809
59 628100-Travel	482401	21,149	21,678	22,220	22,775	23,345	23,928	24,526	25,140	25,768	26,412
60 628501-Misc-License,Insp&Permit Fees	482401	79,309	81,292	83,324	85,407	87,542	89,731	91,974	94,273	96,630	99,046
61 628515-Shared Services Expense	482401	1,057,452	1,099,750	1,143,740	1,189,490	1,237,070	1,285,553	1,335,015	1,385,535	1,447,197	1,505,084
62 601100-Salar-Full Time-Gen City	482411	442,332	453,391	464,725	476,344	488,252	500,458	512,970	525,794	538,939	552,412
63 601115-Salaries-Contractual	482411	109,446	112,182	114,987	117,862	120,808	123,828	126,924	130,097	133,350	136,683
64 601300-Salar-Overtime-Gen City	482411	52,873	54,194	55,549	56,938	58,361	59,821	61,316	62,849	64,420	66,031
65 602100-Wages-Full Time-Gen City	482411	1,596,542	1,636,455	1,677,367	1,719,301	1,762,283	1,806,340	1,851,499	1,897,786	1,945,231	1,993,862
66 602400-Wages-Shift Prem-Gen City	482411	211,490	216,778	222,197	227,752	233,446	239,282	245,264	251,396	257,681	264,123
67 603125-Emplr Pd Pension-GRS	482411	107,437	110,123	112,876	115,698	118,591	121,555	124,594	127,709	130,902	134,174
68 603200-Emplr Pd Ben-Medical	482411	294,818	306,610	318,875	331,630	344,895	358,691	373,038	387,960	403,478	419,618
69 603300-Employer Pd FICA	482411	184,578	191,961	199,840	207,625	215,931	224,568	233,550	242,892	252,608	262,712
70 603400-Unemployment	482411	23,634	24,225	24,831	25,451	26,088	26,740	27,408	28,093	28,796	29,516
71 603405-Workers' Compensation	482411	141,593	145,133	148,761	152,480	156,292	160,199	164,204	168,309	172,517	176,830
72 603900-Emp Benefits-Miscellaneous	482411	9,676	9,918	10,166	10,420	10,680	10,947	11,221	11,501	11,789	12,084

Schedule 4: Cash Out

Object Description	Cost Center	FY 2023 <sup>1</sup>	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
73 604100-Other Comp-Unused Sick Leave	482411	2,168	2,222	2,278	2,334	2,393	2,453	2,514	2,577	2,641	2,707
74 605100-Group Life Insurance	482411	6,239	6,489	6,748	7,018	7,299	7,591	7,894	8,210	8,538	8,880
75 605205-Eye Care-Active Civilian	482411	3,860	4,014	4,175	4,342	4,515	4,696	4,884	5,079	5,282	5,494
76 605500-Income Protection-LTD	482411	6,503	6,763	7,034	7,315	7,608	7,912	8,229	8,558	8,900	9,256
77 605620-Dental Active	482411	15,703	16,331	16,985	17,664	18,370	19,105	19,870	20,664	21,491	22,351
78 605700-Health Care Reserve - Civilian	482411	48,273	50,204	52,212	54,300	56,472	58,731	61,080	63,524	66,065	68,707
79 620100-Office Supplies	482411	13,218	13,549	13,887	14,235	14,590	14,955	15,329	15,712	16,105	16,508
80 621900-Oper Supplies-Miscellaneous	482411	13,218	13,549	13,887	14,235	14,590	14,955	15,329	15,712	16,105	16,508
81 626500-Dues & Miscellaneous	482411	2,644	2,710	2,777	2,847	2,918	2,991	3,066	3,142	3,221	3,302
82 627105-Private Car Reimbursements	482411	13,218	13,549	13,887	14,235	14,590	14,955	15,329	15,712	16,105	16,508
83 628501-Misc-License,Insp&Permit Fees	482411	10,575	10,839	11,110	11,388	11,672	11,964	12,263	12,570	12,884	13,206
84 601100-Salar-Full Time-Gen City	482421	35,316	36,199	37,104	38,031	38,982	39,956	40,955	41,979	43,029	44,104
85 601115-Salaries-Contractual	482421	22,225	22,781	23,350	23,934	24,533	25,146	25,775	26,419	27,079	27,756
86 602100-Wages-Full Time-Gen City	482421	308,329	316,037	323,938	332,037	340,338	348,846	357,567	366,506	375,669	385,061
87 603125-Emplr Pd Pension-GRS	482421	18,270	18,727	19,195	19,675	20,167	20,671	21,188	21,717	22,260	22,817
88 603200-Emplr Pd Ben-Medical	482421	44,733	46,522	48,383	50,319	52,331	54,425	56,602	58,866	61,220	63,669
89 603300-Employer Pd FICA	482421	28,017	29,138	30,303	31,515	32,776	34,087	35,451	36,869	38,343	39,877
90 603400-Unemployment	482421	3,579	3,668	3,760	3,854	3,950	4,049	4,150	4,254	4,360	4,469
91 603405-Workers' Compensation	482421	21,472	22,009	22,559	23,123	23,701	24,294	24,901	25,523	26,161	26,815
92 603900-Emp Benefits-Miscellaneous	482421	1,460	1,496	1,534	1,572	1,611	1,652	1,693	1,735	1,779	1,823
93 604100-Other Comp-Unused Sick Leave	482421	330	338	346	355	364	373	382	392	402	412
94 605100-Group Life Insurance	482421	942	979	1,019	1,059	1,102	1,146	1,192	1,239	1,289	1,340
95 605205-Eye Care-Active Civilian	482421	565	588	611	636	661	687	715	744	773	804
96 605500-Income Protection-LTD	482421	999	1,028	1,070	1,112	1,157	1,203	1,251	1,301	1,353	1,407
97 605620-Dental Active	482421	2,354	2,449	2,546	2,648	2,754	2,864	2,979	3,098	3,222	3,351
98 605700-Health Care Reserve - Civilian	482421	7,299	7,591	7,894	8,210	8,538	8,880	9,235	9,604	9,989	10,388
99 617900-Contract Svcs-Other-Misc	482421	1,445,964	1,482,113	1,519,166	1,557,145	1,596,074	1,635,976	1,676,875	1,718,797	1,761,767	1,805,811
100 620100-Office Supplies	482421	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
101 622200-Repairs & Maint-Bldgs&Ground	482421	70,631	72,397	74,207	76,062	77,964	79,913	81,911	83,958	86,057	88,209
102 622300-Repairs & Maint-Equipment	482421	20,719	21,236	21,767	22,312	22,869	23,441	24,027	24,628	25,243	25,875
103 622400-Repairs & Maint-Facilities	482421	105,947	108,596	111,311	114,093	116,946	119,869	122,866	125,938	129,086	132,313
104 622900-Repairs & Maint-Misc	482421	120,073	123,075	126,152	129,306	132,538	135,852	139,248	142,729	146,298	149,955
105 626801-Utilities-Water	482421	527,004	540,179	553,683	567,525	581,713	596,256	611,163	626,442	642,103	658,155
106 626802-Utilities-Gas	482421	302,208	309,763	317,507	325,445	333,581	341,920	350,468	359,230	368,211	377,416
107 626803-Utilities-Steam	482421	69,595	71,335	73,119	74,947	76,820	78,741	80,709	82,727	84,795	86,915
108 626804-Utilities-Electricity	482421	789,328	809,062	829,288	850,020	871,271	893,053	915,379	938,263	961,720	985,763
109 628501-Misc-License,Insp&Permit Fees	482421	11,772	12,066	12,368	12,677	12,994	13,319	13,652	13,993	14,343	14,701
110 601100-Salar-Full Time-Gen City	482422	168,783	173,003	177,328	181,761	186,305	190,963	195,737	200,630	205,646	210,787
111 601300-Salar-Overtime-Gen City	482422	24,863	25,484	26,121	26,774	27,444	28,130	28,833	29,554	30,293	31,050
112 601400-Salar-Shift Prem-Gen City	482422	1,364	1,399	1,433	1,469	1,506	1,544	1,582	1,622	1,662	1,704
113 601500-Salaries-Holiday Premium	482422	27,895	28,592	29,307	30,040	30,791	31,560	32,349	33,158	33,987	34,837
114 617400 - Contract Svcs Info Technology	482422	20,214	20,719	21,237	21,768	22,312	22,870	23,442	24,028	24,628	25,244
115 602100-Wages-Full Time-Gen City	482422	369,656	378,897	388,370	398,079	408,031	418,232	428,687	439,404	450,390	461,649
116 603125-Emplr Pd Pension-GRS	482422	26,935	27,608	28,298	29,006	29,731	30,474	31,236	32,017	32,817	33,638
117 603200-Emplr Pd Ben-Medical	482422	72,415	75,312	78,324	81,457	84,715	88,104	91,628	95,293	99,105	103,069
118 603300-Employer Pd FICA	482422	45,329	47,142	49,028	50,989	53,028	55,150	57,356	59,650	62,036	64,517
119 603400-Unemployment	482422	5,811	5,957	6,106	6,258	6,415	6,575	6,739	6,908	7,081	7,258
120 603405-Workers' Compensation	482422	34,767	35,637	36,527	37,441	38,377	39,336	40,319	41,327	42,361	43,420
121 603900-Emp Benefits-Miscellaneous	482422	2,375	2,434	2,495	2,558	2,622	2,687	2,754	2,823	2,894	2,966
122 604100-Other Comp-Unused Sick Leave	482422	505	518	531	544	558	572	586	601	616	631
123 605100-Group Life Insurance	482422	1,516	1,577	1,640	1,705	1,774	1,844	1,918	1,995	2,075	2,158
124 605205-Eye Care-Active Civilian	482422	960	999	1,038	1,080	1,123	1,168	1,215	1,263	1,314	1,367
125 605500-Income Protection-LTD	482422	1,617	1,682	1,749	1,819	1,892	1,967	2,046	2,128	2,213	2,302
126 605620-Dental Active	482422	3,841	3,994	4,154	4,320	4,493	4,673	4,860	5,054	5,256	5,466
127 605700-Health Care Reserve - Civilian	482422	11,875	12,350	12,845	13,358	13,893	14,448	15,026	15,627	16,252	16,903
128 617900-Contract Svcs-Other-Misc	482422	1,243,084	1,274,161	1,306,015	1,338,666	1,372,132	1,406,436	1,441,597	1,477,636	1,514,577	1,552,442
129 620100-Office Supplies	482422	2,527	2,590	2,655	2,721	2,789	2,859	2,930	3,003	3,079	3,155
130 621300-Oper Supplies-Automotive	482422	12,633	12,949	13,273	13,605	13,945	14,294	14,651	15,017	15,393	15,777
131 621900-Oper Supplies-Miscellaneous	482422	2,527	2,590	2,655	2,721	2,789	2,859	2,930	3,003	3,079	3,155
132 622100-Repairs & Maint-Automotive	482422	156,655	160,572	164,586	168,701	172,918	177,241	181,672	186,214	190,869	195,641
133 623100-Uniforms, Laundry, Cleaning	482422	10,107	10,618	11,140	11,684	12,251	12,841	13,454	14,091	14,751	15,434
134 626435 - Rentals-Lease of Equipment	482422	151,602	155,392	159,277	163,259	167,340	171,524	175,812	180,207	184,712	189,330
135 626500-Dues & Miscellaneous	482422	5,559	5,698	5,840	5,986	6,136	6,289	6,446	6,608	6,773	6,942
136 628100-Travel	482422	5,053	5,180	5,309	5,442	5,578	5,717	5,860	6,007	6,157	6,311
137 628501-Misc-License,Insp&Permit Fees	482422	7,580	7,770	7,964	8,163	8,367	8,576	8,791	9,010	9,236	9,466
138 601100-Salar-Full Time-Gen City	482431	703,938	721,536	739,575	758,064	777,015	796,441	816,352	836,761	857,680	879,122
139 601300-Salar-Overtime-Gen City	482431	505,339	517,973	530,922	544,195	557,800	571,745	586,039	600,690	615,707	631,100
140 601400-Salar-Shift Prem-Gen City	482431	7,580	7,770	7,964	8,163	8,367	8,576	8,791	9,010	9,236	9,466
141 601500-Salaries-Holiday Premium	482431	131,590	134,880	138,252	141,708	145,251	148,882	152,604	156,420	160,330	164,338
142 602100-Wages-Full Time-Gen City	482431	3,133,710	3,212,053	3,292,354	3,374,663	3,459,030	3,545,505	3,634,143	3,724,997	3,818,122	3,913,575
143 603125-Emplr Pd Pension-GRS	482431	191,928	196,726	201,644	206,685	211,852	217,149	222,577	228,142	233,845	239,692
144 603200-Emplr Pd Ben-Medical	482431	547,687	569,594	592,378	616,073	640,716	666,345	692,998	720,718	749,547	779,529

Schedule 4: Cash Out

Object Description	Cost Center	FY 2023 <sup>1</sup>	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
145 603300-Employer Pd FICA	482431	342,923	356,640	370,906	385,742	401,172	417,219	433,907	451,264	469,314	488,087
146 603400-Unemployment	482431	43,965	45,064	46,190	47,345	48,529	49,742	50,985	52,260	53,567	54,906
147 603405-Workers' Compensation	482431	263,080	269,657	276,398	283,308	290,391	297,650	305,092	312,719	320,537	328,550
148 603900-Emp Benefits-Miscellaneous	482431	17,899	18,336	18,795	19,265	19,746	20,240	20,746	21,264	21,796	22,341
149 604100-Other Comp-Unused Sick Leave	482431	4,043	4,144	4,247	4,354	4,462	4,574	4,688	4,806	4,926	5,049
150 605100-Group Life Insurance	482431	11,623	12,088	12,571	13,074	13,597	14,141	14,707	15,295	15,907	16,543
151 605205-Eye Care-Active Civilian	482431	7,176	7,463	7,761	8,072	8,395	8,730	9,080	9,443	9,821	10,213
152 605500-Income Protection-LTD	482431	12,128	12,613	13,118	13,643	14,188	14,756	15,346	15,960	16,598	17,262
153 605620-Dental Active	482431	29,108	30,272	31,483	32,742	34,052	35,414	36,830	38,304	39,836	41,429
154 605700-Health Care Reserve - Civilian	482431	89,647	93,233	96,962	100,841	104,875	109,070	113,432	117,970	122,688	127,596
155 617900-Contract Svcs-Other-Misc	482431	1,263,348	1,294,932	1,327,305	1,360,488	1,394,500	1,429,363	1,465,097	1,501,724	1,539,267	1,577,749
156 620100-Office Supplies	482431	21,022	21,548	22,086	22,639	23,204	23,785	24,379	24,989	25,613	26,254
157 621400-Oper Supplies-Janitorial	482431	2,527	2,590	2,655	2,721	2,789	2,859	2,930	3,003	3,079	3,155
158 621600-Operating Supplies-Chemicals	482431	5,154	5,283	5,415	5,551	5,690	5,832	5,978	6,127	6,280	6,437
159 621900-Oper Supplies-Miscellaneous	482431	112,842	115,663	118,555	121,519	124,557	127,671	130,862	134,134	137,487	140,925
160 622300-Repairs & Maint-Equipment	482431	200,114	205,117	210,245	215,501	220,889	226,411	232,071	237,873	243,820	249,915
161 622900-Repairs & Maint-Misc	482431	467,439	479,125	491,103	503,381	515,965	528,864	542,086	555,638	569,529	583,767
162 626435-Rentals - Lease of Equipment	482431	25,267	25,899	26,546	27,210	27,890	28,587	29,302	30,034	30,785	31,555
163 626500-Dues & Miscellaneous	482431	2,021	2,072	2,124	2,177	2,231	2,287	2,344	2,403	2,463	2,524
164 627105-Private Car Reimbursements	482431	1,516	1,554	1,593	1,633	1,673	1,715	1,758	1,802	1,847	1,893
165 627195-Employee Uniform Expense	482431	63,167	64,747	66,365	68,024	69,725	71,468	73,255	75,086	76,963	78,887
166 627225-Other Oper Svc-Miscellaneous	482431	8,085	8,288	8,495	8,707	8,925	9,148	9,377	9,611	9,851	10,098
167 627230-Employee Parking	482431	505	518	531	544	558	572	586	601	616	631
168 628100-Travel	482431	4,548	4,662	4,778	4,898	5,020	5,146	5,274	5,406	5,541	5,680
169 628501-Misc-License,Insp&Permit Fees	482431	11,117	11,395	11,680	11,972	12,272	12,578	12,893	13,215	13,546	13,884
170 601100-Salar-Full Time-Gen City	482432	151,316	155,099	158,977	162,951	167,025	171,201	175,481	179,868	184,364	188,973
171 601300-Salar-Overtime-Gen City	482432	10,249	10,505	10,767	11,037	11,312	11,595	11,885	12,182	12,487	12,799
172 601400-Salar-Shift Prem-Gen City	482432	653	669	686	703	721	739	757	776	796	816
173 601500-Salaries-Holiday Premium	482432	34,363	35,222	36,102	37,005	37,930	38,878	39,850	40,846	41,868	42,914
174 602100-Wages-Full Time-Gen City	482432	1,189,984	1,219,734	1,250,227	1,281,483	1,313,520	1,346,358	1,380,017	1,414,517	1,449,880	1,486,127
175 603125-Empir Pd Pension-GRS	482432	67,068	68,744	70,463	72,224	74,030	75,881	77,778	79,722	81,715	83,758
176 603200-Empir Pd Ben-Medical	482432	169,452	176,230	183,280	190,611	198,235	206,165	214,411	222,988	231,907	241,183
177 603300-Employer Pd FICA	482432	106,102	110,346	114,760	119,351	124,125	129,090	134,253	139,623	145,208	151,017
178 603400-Unemployment	482432	13,564	13,903	14,251	14,607	14,972	15,347	15,730	16,124	16,527	16,940
179 603405-Workers' Compensation	482432	81,385	83,420	85,505	87,643	89,834	92,080	94,382	96,742	99,160	101,639
180 603900-Emp Benefits-Miscellaneous	482432	5,526	5,664	5,806	5,951	6,100	6,252	6,409	6,569	6,733	6,901
181 604100-Other Comp-Unused Sick Leave	482432	1,256	1,287	1,320	1,353	1,386	1,421	1,457	1,493	1,530	1,569
182 605100-Group Life Insurance	482432	3,617	3,762	3,912	4,069	4,232	4,401	4,577	4,760	4,950	5,148
183 605205-Eye Care-Active Civilian	482432	2,210	2,299	2,391	2,486	2,586	2,689	2,797	2,909	3,025	3,146
184 605500-Income Protection-LTD	482432	3,768	3,919	4,075	4,238	4,408	4,584	4,768	4,958	5,157	5,363
185 605620-Dental Active	482432	9,043	9,405	9,781	10,172	10,579	11,002	11,442	11,900	12,376	12,871
186 605700-Health Care Reserve - Civilian	482432	27,731	28,841	29,994	31,194	32,442	33,739	35,089	36,492	37,952	39,470
187 617400-Contract Svcs-Info Technology	482432	82,892	84,965	87,089	89,266	91,498	93,785	96,130	98,533	100,996	103,521
188 617900-Contract Svcs-Other-Misc	482432	500,389	512,878	525,700	538,843	552,314	566,122	580,275	594,782	609,651	624,892
189 620100-Office Supplies	482432	10,048	10,299	10,556	10,820	11,091	11,368	11,652	11,943	12,242	12,548
190 621900-Oper Supplies-Miscellaneous	482432	351,665	360,457	369,468	378,705	388,172	397,877	407,824	418,019	428,470	439,181
191 622900-Repairs & Maint-Misc	482432	150,714	154,481	158,343	162,302	166,360	170,519	174,782	179,151	183,630	188,221
192 626010 - Advertising	482432	30,143	30,896	31,669	32,460	33,272	34,104	34,956	35,830	36,726	37,644
193 626100 - Printing	482432	5,024	5,149	5,278	5,410	5,545	5,684	5,826	5,972	6,121	6,274
194 626500-Dues & Miscellaneous	482432	5,024	5,149	5,278	5,410	5,545	5,684	5,826	5,972	6,121	6,274
195 626600-Postage	482432	12,559	12,873	13,195	13,525	13,863	14,210	14,565	14,929	15,302	15,685
196 628100-Travel	482432	10,048	10,299	10,556	10,820	11,091	11,368	11,652	11,943	12,242	12,548
197 601100-Salar-Full Time-Gen City	482435	135,000	138,375	141,834	145,380	149,015	152,740	156,559	160,473	164,484	168,597
198 601200 - Wages-Full Time	482435	50,300	51,558	52,846	54,168	55,522	56,910	58,333	59,791	61,286	62,818
199 603125-Empir Pd Pension-GRS	482435	9,300	9,533	9,771	10,015	10,265	10,522	10,785	11,055	11,331	11,614
200 603200-Empir Pd Ben-Medical	482435	22,700	23,608	24,552	25,534	26,556	27,618	28,723	29,872	31,067	32,309
201 603300-Employer Pd FICA	482435	14,200	14,768	15,359	15,973	16,612	17,276	17,968	18,686	19,434	20,211
202 603400-Unemployment	482435	1,800	1,845	1,891	1,938	1,987	2,037	2,087	2,140	2,193	2,248
203 603405-Workers' Compensation	482435	10,900	11,173	11,452	11,738	12,032	12,332	12,641	12,957	13,281	13,613
204 603900-Emp Benefits-Miscellaneous	482435	700	718	735	754	773	792	812	832	853	874
205 604100-Other Comp-Unused Sick Leave	482435	200	205	210	215	221	226	232	238	244	250
206 605100-Group Life Insurance	482435	500	520	541	562	585	608	633	658	684	712
207 605205-Eye Care-Active Civilian	482435	300	312	324	337	351	365	380	395	411	427
208 605500-Income Protection-LTD	482435	500	520	541	562	585	608	633	658	684	712
209 605620-Dental Active	482435	1,200	1,248	1,298	1,350	1,404	1,460	1,518	1,579	1,642	1,708
210 605700-Health Care Reserve - Civilian	482435	3,700	3,848	4,002	4,162	4,328	4,502	4,682	4,869	5,064	5,266
211 620100 - Office Supplies	482435	5,000	5,125	5,253	5,384	5,519	5,657	5,798	5,943	6,092	6,244
212 621900-Oper Supplies-Miscellaneous	482435	20,000	20,500	21,013	21,538	22,076	22,628	23,194	23,774	24,368	24,977
213 626600 - Postage	482435	200	205	210	215	221	226	232	238	244	250
214 627195 - Employee Uniform Expense	482435	2,000	2,050	2,101	2,154	2,208	2,263	2,319	2,377	2,437	2,498
215 601100-Salar-Full Time-Gen City	482223	77,600	79,540	81,529	83,567	85,658	87,798	89,993	92,242	94,548	96,912
216 601300-Salar-Overtime-Gen City	482223	56,505	57,918	59,366	60,850	62,371	63,930	65,529	67,167	68,846	70,567

Schedule 4: Cash Out

Object Description	Cost Center	FY 2023 <sup>1</sup>	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
217 601400-Salar-Shift Prem-Gen City	482223	9,418	9,653	9,894	10,142	10,395	10,655	10,921	11,194	11,474	11,761
218 602100-Wages-Full Time-Gen City	482223	285,068	292,195	299,499	306,987	314,662	322,528	330,591	338,856	347,328	356,011
219 603125-Empplr Pd Pension-GRS	482223	18,129	18,582	19,046	19,523	20,011	20,511	21,024	21,549	22,088	22,640
220 603200-Empplr Pd Ben-Medical	482223	52,385	53,695	55,037	56,413	57,823	59,269	60,750	62,269	63,826	65,422
221 603300-Employer Pd FICA	482223	32,796	33,616	34,457	35,318	36,201	37,106	38,034	38,985	39,959	40,958
222 603400-Unemployment	482223	4,191	4,296	4,403	4,513	4,626	4,741	4,860	4,982	5,106	5,234
223 603405-Workers' Compensation	482223	25,168	25,797	26,442	27,103	27,781	28,476	29,187	29,917	30,665	31,432
224 603900-Emp Benefits-Miscellaneous	482223	1,719	1,762	1,806	1,851	1,897	1,945	1,993	2,043	2,094	2,146
225 604100-Other Comp-Unused Sick Leave	482223	377	386	396	406	416	426	437	448	459	470
226 605100-Group Life Insurance	482223	1,107	1,134	1,163	1,192	1,221	1,252	1,283	1,315	1,348	1,382
227 605205-Eye Care-Active Civilian	482223	683	700	717	735	754	772	792	812	832	853
228 605500-Income Protection-LTD	482223	1,154	1,182	1,212	1,242	1,273	1,305	1,338	1,371	1,406	1,441
229 605620-Dental Active	482223	2,778	2,848	2,919	2,992	3,067	3,143	3,222	3,302	3,385	3,470
230 605700-Health Care Reserve - Civilian	482223	8,570	8,784	9,004	9,229	9,460	9,696	9,938	10,187	10,442	10,703
231 616100-Consultant Fees-Mgt Consult	482223	211,894	217,191	222,621	228,187	233,891	239,738	245,732	251,875	258,172	264,626
232 617900 - Contract Svcs-Other-Misc	482223	47,088	48,265	49,471	50,708	51,976	53,275	54,607	55,972	57,372	58,806
233 620100-Office Supplies	482223	3,532	3,620	3,710	3,803	3,898	3,996	4,096	4,198	4,303	4,410
234 621900-Oper Supplies-Miscellaneous	482223	3,532	3,620	3,710	3,803	3,898	3,996	4,096	4,198	4,303	4,410
235 626100-Printing	482223	1,648	1,689	1,731	1,775	1,819	1,865	1,911	1,959	2,008	2,058
236 626500-Dues & Miscellaneous	482223	1,884	1,931	1,979	2,028	2,079	2,131	2,184	2,239	2,295	2,352
237 626600-Postage	482223	1,177	1,207	1,237	1,268	1,299	1,332	1,365	1,399	1,434	1,470
238 627105-Private Car Reimbursements	482223	4,709	4,826	4,947	5,071	5,198	5,328	5,461	5,597	5,737	5,881
239 628501-Misc-License,Insp&Permit Fees	482223	235	241	247	254	260	266	273	280	287	294
240 601100-Salar-Full Time-Gen City	483101	214,390	219,749	225,243	230,874	236,646	242,562	248,626	254,842	261,213	267,743
241 603125-Empplr Pd Pension-GRS	483101	10,689	10,956	11,230	11,511	11,799	12,093	12,396	12,706	13,023	13,349
242 603200-Empplr Pd Ben-Medical	483101	26,181	27,228	28,317	29,450	30,628	31,853	33,127	34,452	35,830	37,263
243 603300-Employer Pd FICA	483101	16,386	17,042	17,724	18,433	19,170	19,937	20,734	21,563	22,426	23,323
244 603400-Unemployment	483101	2,072	2,124	2,177	2,231	2,287	2,344	2,403	2,463	2,524	2,587
245 603405-Workers' Compensation	483101	12,572	12,887	13,209	13,539	13,878	14,224	14,580	14,945	15,318	15,701
246 603900-Emp Benefits-Miscellaneous	483101	848	869	890	913	936	959	983	1,008	1,033	1,059
247 604100-Other Comp-Unused Sick Leave	483101	188	193	198	203	208	213	218	224	229	235
248 605100-Group Life Insurance	483101	565	588	611	636	661	687	715	744	773	804
249 605205-Eye Care-Active Civilian	483101	330	343	357	371	386	401	417	434	451	469
250 605500-Income Protection-LTD	483101	612	637	662	689	716	745	775	806	838	871
251 605620-Dental Active	483101	1,413	1,469	1,528	1,589	1,653	1,719	1,787	1,859	1,933	2,011
252 605700-Health Care Reserve - Civilian	483101	4,285	4,456	4,635	4,820	5,013	5,213	5,422	5,639	5,864	6,099
253 613100-Legal	483101	400,244	410,250	420,506	431,019	441,795	452,839	464,160	475,764	487,658	499,850
254 620100-Office Supplies	483101	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
255 626500-Dues & Miscellaneous	483101	3,579	3,668	3,760	3,854	3,950	4,049	4,150	4,254	4,360	4,469
256 626600-Postage	483101	471	483	495	507	520	533	546	560	574	588
257 627105-Private Car Reimbursements	483101	283	290	297	304	312	320	328	336	344	353
258 627230-Employee Parking	483101	1,695	1,738	1,781	1,825	1,871	1,918	1,966	2,015	2,065	2,117
259 628100-Travel	483101	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
260 661100-Damage Claims	483101	235,438	235,438	235,438	235,438	235,438	235,438	235,438	235,438	235,438	235,438
261 601100-Salar-Full Time-Gen City	483201	357,536	366,474	375,636	385,027	394,652	404,519	414,632	424,998	435,622	446,513
262 603125-Empplr Pd Pension-GRS	483201	17,893	18,341	18,799	19,269	19,751	20,245	20,751	21,269	21,801	22,346
263 603200-Empplr Pd Ben-Medical	483201	43,650	45,396	47,212	49,100	51,064	53,107	55,231	57,441	59,738	62,128
264 603300-Employer Pd FICA	483201	27,358	28,452	29,590	30,774	32,005	33,285	34,616	36,001	37,441	38,939
265 603400-Unemployment	483201	3,484	3,572	3,661	3,752	3,846	3,942	4,041	4,142	4,245	4,352
266 603405-Workers' Compensation	483201	21,001	21,526	22,064	22,616	23,181	23,761	24,355	24,964	25,588	26,227
267 603900-Emp Benefits-Miscellaneous	483201	1,413	1,448	1,484	1,521	1,559	1,598	1,638	1,679	1,721	1,764
268 604100-Other Comp-Unused Sick Leave	483201	330	338	346	355	364	373	382	392	402	412
269 605100-Group Life Insurance	483201	942	979	1,019	1,059	1,102	1,146	1,192	1,239	1,289	1,340
270 605205-Eye Care-Active Civilian	483201	612	637	662	689	716	745	775	806	838	871
271 605500-Income Protection-LTD	483201	942	979	1,019	1,059	1,102	1,146	1,192	1,239	1,289	1,340
272 605620-Dental Active	483201	2,354	2,449	2,546	2,648	2,754	2,864	2,979	3,098	3,222	3,351
273 605700-Health Care Reserve - Civilian	483201	7,157	7,444	7,741	8,051	8,373	8,708	9,056	9,419	9,795	10,187
274 617900-Contract Svcs-Other-Misc	483201	25,898	26,546	27,209	27,889	28,587	29,301	30,034	30,785	31,554	32,343
275 620100-Office Supplies	483201	7,063	7,240	7,421	7,606	7,796	7,991	8,191	8,396	8,606	8,821
276 626100-Printing	483201	4,709	4,826	4,947	5,071	5,198	5,328	5,461	5,597	5,737	5,881
277 626500-Dues & Miscellaneous	483201	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
278 627110-Purchased Svcs - Other	483201	47,088	48,265	49,471	50,708	51,976	53,275	54,607	55,972	57,372	58,806
279 627225-Other Oper Svc-Miscellaneous	483201	14,126	14,479	14,841	15,212	15,593	15,983	16,382	16,792	17,211	17,642
280 627230-Employee Parking	483201	6,781	6,950	7,124	7,302	7,485	7,672	7,863	8,060	8,262	8,468
281 628100-Travel	483201	4,709	4,826	4,947	5,071	5,198	5,328	5,461	5,597	5,737	5,881
282 628200-Training	483201	104,346	106,955	109,628	112,369	115,178	118,058	121,009	124,035	127,135	130,314
283 628208-Training-Tuition Reimbursement	483201	37,670	38,612	39,577	40,566	41,581	42,620	43,686	44,778	45,897	47,045
284 601100-Salar-Full Time-Gen City	483301	928,818	949,989	973,739	998,082	1,023,034	1,048,610	1,074,825	1,101,696	1,129,238	1,157,469
285 601115-Salaries-Contractual	483301	37,009	37,934	38,882	39,854	40,851	41,872	42,919	43,992	45,091	46,219
286 602100-Wages-Full Time-Gen City	483301	102,785	105,354	107,988	110,688	113,455	116,292	119,199	122,179	125,233	128,364
287 603125-Empplr Pd Pension-GRS	483301	53,300	54,633	55,998	57,398	58,833	60,340	61,812	63,357	64,941	66,564
288 603200-Empplr Pd Ben-Medical	483301	130,331	135,545	140,967	146,605	152,469	158,568	164,911	171,507	178,368	185,502

Schedule 4: Cash Out

Object Description	Cost Center	FY 2023 <sup>1</sup>	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
289 603300-Employer Pd FICA	483301	81,610	84,874	88,269	91,800	95,472	99,291	103,262	107,393	111,689	116,156
290 603400-Unemployment	483301	10,454	10,715	10,983	11,258	11,539	11,828	12,123	12,427	12,737	13,056
291 603405-Workers' Compensation	483301	62,609	64,175	65,779	67,424	69,109	70,837	72,608	74,423	76,284	78,191
292 603900-Emp Benefits-Miscellaneous	483301	4,273	4,380	4,489	4,602	4,717	4,835	4,956	5,079	5,206	5,337
293 604100-Other Comp-Unused Sick Leave	483301	992	1,017	1,042	1,068	1,095	1,122	1,150	1,179	1,209	1,239
294 605100-Group Life Insurance	483301	2,785	2,897	3,012	3,133	3,258	3,389	3,524	3,665	3,812	3,964
295 605205-Eye Care-Active Civilian	483301	1,679	1,746	1,816	1,888	1,964	2,042	2,124	2,209	2,297	2,389
296 605500-Income Protection-LTD	483301	2,900	3,016	3,136	3,262	3,392	3,528	3,669	3,816	3,968	4,127
297 605620-Dental Active	483301	6,944	7,222	7,511	7,811	8,123	8,448	8,786	9,138	9,503	9,883
298 605700-Health Care Reserve - Civilian	483301	21,328	22,181	23,068	23,991	24,950	25,948	26,986	28,066	29,188	30,356
299 617400-Contract Svcs-Info Technology	483301	669,208	685,938	703,086	720,664	738,680	757,147	776,076	795,478	815,365	835,749
300 620100-Office Supplies	483301	5,723	5,866	6,013	6,163	6,317	6,475	6,637	6,803	6,973	7,147
301 622300-Repairs & Maint-Equipment	483301	80,503	82,516	84,579	86,693	88,861	91,082	93,359	95,693	98,085	100,538
302 622301-Hardware Maintenance	483301	220,907	226,430	232,091	237,893	243,840	249,936	256,185	262,589	269,154	275,883
303 622302-Software Maintenance	483301	2,031,202	2,081,982	2,134,032	2,187,383	2,242,067	2,298,119	2,355,572	2,414,461	2,474,823	2,536,693
304 626010-Advertising	483301	1,908	1,955	2,004	2,054	2,106	2,158	2,212	2,268	2,324	2,382
305 626100-Printing	483301	3,815	3,911	4,008	4,109	4,211	4,317	4,425	4,535	4,649	4,765
306 626415-Rentals- Office Equipment	483301	3,815	3,911	4,008	4,109	4,211	4,317	4,425	4,535	4,649	4,765
307 626435 - Rentals-Lease of Equipment	483301	5,723	5,866	6,013	6,163	6,317	6,475	6,637	6,803	6,973	7,147
308 626500-Dues & Miscellaneous	483301	3,815	3,911	4,008	4,109	4,211	4,317	4,425	4,535	4,649	4,765
309 626600-Postage	483301	6,105	6,257	6,414	6,574	6,738	6,907	7,079	7,256	7,438	7,624
310 626700-Telecommunications	483301	171,690	175,982	180,381	184,891	189,513	194,251	199,107	204,085	209,187	214,417
311 626702-Data Com Equip	483301	152,613	156,428	160,339	164,347	168,456	172,668	176,984	181,409	185,944	190,593
312 627105-Private Car Reimbursements	483301	229	235	241	247	253	259	265	272	279	286
313 627230-Employee Parking	483301	11,446	11,732	12,025	12,326	12,634	12,950	13,274	13,606	13,946	14,294
314 628100-Travel	483301	12,209	12,514	12,827	13,148	13,476	13,813	14,159	14,513	14,876	15,247
315 628515-Shared Services Expense	483301	486,225	505,674	525,901	546,937	568,814	591,567	615,230	639,839	665,432	692,050
316 601100-Salar-Full Time-Gen City	483411	360,549	369,563	378,802	388,272	397,979	407,928	418,127	428,580	439,294	450,277
317 601300-Salar-Overtime-Gen City	483411	35,269	36,150	37,054	37,980	38,930	39,903	40,901	41,923	42,971	44,046
318 601400-Salar-Shift Prem-Gen City	483411	3,108	3,185	3,265	3,347	3,430	3,516	3,604	3,694	3,787	3,881
319 601500-Salaries-Holiday Premium	483411	1,413	1,448	1,484	1,521	1,559	1,598	1,638	1,679	1,721	1,764
320 602100-Wages-Full Time-Gen City	483411	576,446	590,857	605,628	620,769	636,288	652,195	668,500	685,213	702,343	719,902
321 602130-Wages-Holiday Pay	483411	11,254	11,535	11,824	12,119	12,422	12,733	13,051	13,377	13,712	14,055
322 602300-Wages-Overtime-Gen City	483411	132,457	135,769	139,163	142,642	146,208	149,863	153,610	157,450	161,386	165,421
323 602400-Wages-Shift Prem-Gen City	483411	4,097	4,199	4,304	4,412	4,522	4,635	4,751	4,870	4,991	5,116
324 603125-Emplr Pd Pension-GRS	483411	46,805	47,975	49,175	50,404	51,664	52,956	54,279	55,636	57,027	58,453
325 603200-Emplr Pd Ben-Medical	483411	140,603	146,228	152,077	158,160	164,486	171,066	177,908	185,024	192,425	200,122
326 603300-Employer Pd FICA	483411	88,054	91,576	95,239	99,048	103,010	107,131	111,416	115,873	120,508	125,328
327 603400-Unemployment	483411	11,301	11,584	11,873	12,170	12,474	12,786	13,106	13,433	13,769	14,113
328 603405-Workers' Compensation	483411	67,524	69,212	70,942	72,715	74,533	76,397	78,307	80,264	82,271	84,328
329 603900-Emp Benefits-Miscellaneous	483411	4,567	4,682	4,799	4,919	5,042	5,168	5,297	5,429	5,565	5,704
330 604100-Other Comp-Unused Sick Leave	483411	1,036	1,062	1,088	1,116	1,143	1,172	1,201	1,231	1,262	1,294
331 605100-Group Life Insurance	483411	2,967	3,085	3,209	3,337	3,470	3,609	3,754	3,904	4,060	4,222
332 605205-Eye Care-Active Civilian	483411	1,836	1,910	1,986	2,066	2,148	2,234	2,324	2,417	2,513	2,614
333 605500-Income Protection-LTD	483411	3,108	3,232	3,361	3,496	3,636	3,781	3,932	4,090	4,253	4,423
334 605620-Dental Active	483411	7,487	7,786	8,098	8,422	8,759	9,109	9,473	9,852	10,246	10,656
335 605700-Health Care Reserve - Civilian	483411	23,026	23,947	24,905	25,901	26,937	28,014	29,135	30,300	31,512	32,773
336 617900-Contract Svcs-Other-Misc	483411	30,654	31,420	32,206	33,011	33,836	34,682	35,549	36,438	37,349	38,283
337 620100-Office Supplies	483411	21,189	21,719	22,262	22,819	23,389	23,974	24,573	25,188	25,817	26,463
338 621900-Oper Supplies-Miscellaneous	483411	37,670	38,612	39,577	40,566	41,581	42,620	43,686	44,778	45,897	47,045
339 622300-Repairs & Maint-Equipment	483411	1,224	1,255	1,286	1,318	1,351	1,385	1,420	1,455	1,492	1,529
340 626500-Dues & Miscellaneous	483411	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
341 627195 - Employee Uniform Expense	483411	30,607	31,372	32,156	32,960	33,784	34,629	35,495	36,382	37,292	38,224
342 628100-Travel	483411	4,709	4,826	4,947	5,071	5,198	5,328	5,461	5,597	5,737	5,881
343 602500 - Wages-Holiday Premium	483411	26,228	26,883	27,556	28,244	28,951	29,674	30,416	31,177	31,956	32,755
344 628501-Misc-License,Insp&Permit Fees	483411	753	772	792	811	832	852	874	896	918	941
345 628515-Shared Services Expense	483411	142,016	147,697	153,605	159,749	166,139	172,784	179,696	186,883	194,359	202,133
346 601100-Salar-Full Time-Gen City	483421	202,194	207,249	212,430	217,741	223,184	228,764	234,483	240,345	246,354	252,512
347 603125-Emplr Pd Pension-GRS	483421	10,077	10,329	10,587	10,852	11,123	11,401	11,686	11,978	12,278	12,584
348 603200-Emplr Pd Ben-Medical	483421	24,674	25,661	26,687	27,755	28,865	30,020	31,220	32,469	33,768	35,119
349 603300-Employer Pd FICA	483421	15,492	16,111	16,756	17,426	18,123	18,848	19,602	20,386	21,202	22,050
350 603400-Unemployment	483421	1,978	2,027	2,078	2,130	2,183	2,238	2,293	2,351	2,410	2,470
351 603405-Workers' Compensation	483421	11,866	12,163	12,467	12,778	13,098	13,425	13,761	14,105	14,458	14,819
352 603900-Emp Benefits-Miscellaneous	483421	800	821	841	862	884	906	928	952	975	1,000
353 604100-Other Comp-Unused Sick Leave	483421	188	193	198	203	208	213	218	224	229	235
354 605100-Group Life Insurance	483421	518	539	560	583	606	630	655	682	709	737
355 605205-Eye Care-Active Civilian	483421	330	343	357	371	386	401	417	434	451	469
356 605500-Income Protection-LTD	483421	518	539	560	583	606	630	655	682	709	737
357 605620-Dental Active	483421	1,318	1,371	1,426	1,483	1,542	1,604	1,668	1,735	1,804	1,877
358 605700-Health Care Reserve - Civilian	483421	4,050	4,212	4,380	4,555	4,737	4,927	5,124	5,329	5,542	5,764
359 616100-Consultant Fees-Mgt Consult	483421	450,157	461,411	472,948	484,770	496,889	509,311	522,044	535,095	548,472	562,184
360 617900-Contract Svcs-Other-Misc	483421	36,587	37,502	38,439	39,400	40,385	41,395	42,430	43,490	44,578	45,692

## Schedule 4: Cash Out

Object Description	Cost Center	FY 2023 <sup>1</sup>	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
361 620100-Office Supplies	483421	7,063	7,240	7,421	7,606	7,796	7,991	8,191	8,396	8,606	8,821
362 621300-Oper Supplies-Automotive	483421	1,224	1,255	1,286	1,318	1,351	1,385	1,420	1,455	1,492	1,529
363 621900-Oper Supplies-Miscellaneous	483421	7,063	7,240	7,421	7,606	7,796	7,991	8,191	8,396	8,606	8,821
364 626010-Advertising	483421	11,772	12,066	12,368	12,677	12,994	13,319	13,652	13,993	14,343	14,701
365 626100-Printing	483421	47,088	48,265	49,471	50,708	51,976	53,275	54,607	55,972	57,372	58,806
366 626500-Dues & Miscellaneous	483421	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
367 626600-Postage	483421	23,544	24,132	24,736	25,354	25,988	26,638	27,304	27,986	28,686	29,403
368 627105-Private Car Reimbursements	483421	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
369 627195-Employee Uniform Expense	483421	7,063	7,240	7,421	7,606	7,796	7,991	8,191	8,396	8,606	8,821
370 627225-Other Oper Svc-Miscellaneous	483421	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
371 627230-Employee Parking	483421	3,390	3,475	3,562	3,651	3,742	3,836	3,932	4,030	4,131	4,234
372 628100-Travel	483421	942	965	989	1,014	1,040	1,066	1,092	1,119	1,147	1,176
373 601100-Salar-Full Time-Gen City	484001	346,753	355,421	364,307	373,415	382,750	392,319	402,127	412,180	422,484	433,046
374 601115-Salaries-Contractual	484001	61,214	62,744	64,313	65,921	67,569	69,258	70,989	72,764	74,583	76,448
375 603125-Empplr Pd Pension-GRS	484001	17,328	17,761	18,205	18,661	19,127	19,605	20,095	20,598	21,113	21,641
376 603200-Empplr Pd Ben-Medical	484001	42,379	44,074	45,837	47,670	49,577	51,560	53,623	55,768	57,998	60,318
377 603300-Employer Pd FICA	484001	26,510	27,571	28,674	29,820	31,013	32,254	33,544	34,886	36,281	37,732
378 603400-Unemployment	484001	3,437	3,523	3,611	3,702	3,794	3,889	3,986	4,086	4,188	4,293
379 603405-Workers' Compensation	484001	20,295	20,802	21,322	21,855	22,402	22,962	23,536	24,124	24,727	25,345
380 603900-Emp Benefits-Miscellaneous	484001	1,413	1,448	1,484	1,521	1,559	1,598	1,638	1,679	1,721	1,764
381 604100-Other Comp-Unused Sick Leave	484001	330	338	346	355	364	373	382	392	402	412
382 605100-Group Life Insurance	484001	895	930	968	1,006	1,047	1,088	1,132	1,177	1,224	1,273
383 605205-Eye Care-Active Civilian	484001	565	588	611	636	661	687	715	744	773	804
384 605500-Income Protection-LTD	484001	942	979	1,019	1,059	1,102	1,146	1,192	1,239	1,289	1,340
385 605620-Dental Active	484001	2,260	2,351	2,445	2,542	2,644	2,750	2,860	2,974	3,093	3,217
386 605700-Health Care Reserve - Civilian	484001	6,922	7,199	7,487	7,786	8,098	8,422	8,758	9,109	9,473	9,852
387 616100-Consultant Fees-Mgt Consult	484001	23,544	24,132	24,736	25,354	25,988	26,638	27,304	27,986	28,686	29,403
388 620100-Office Supplies	484001	14,126	14,479	14,841	15,212	15,593	15,983	16,382	16,792	17,211	17,642
389 621900-Oper Supplies-Miscellaneous	484001	895	917	940	963	988	1,012	1,038	1,063	1,090	1,117
390 626500-Dues & Miscellaneous	484001	1,036	1,062	1,088	1,116	1,143	1,172	1,201	1,231	1,262	1,294
391 627110-Purchased Services - Other	484001	1,412,626	1,447,942	1,484,140	1,521,244	1,559,275	1,598,257	1,638,213	1,679,168	1,721,148	1,764,176
392 627230-Employee Parking	484001	1,130	1,158	1,187	1,217	1,247	1,279	1,311	1,343	1,377	1,411
393 628100 - Travel	484001	2,590	2,655	2,721	2,789	2,859	2,930	3,003	3,078	3,155	3,234
394 628515-Shared Services Expense	484001	16,481	17,140	17,825	18,538	19,280	20,051	20,853	21,687	22,555	23,457
395 601100-Salar-Full Time-Gen City	484111	433,205	444,035	455,136	466,515	478,178	490,132	502,385	514,945	527,819	541,014
396 602100-Wages-Full Time-Gen City	484111	95,729	98,122	100,575	103,090	105,667	108,309	111,016	113,792	116,636	119,552
397 603125-Empplr Pd Pension-GRS	484111	29,524	30,262	31,019	31,794	32,589	33,404	34,239	35,095	35,972	36,871
398 603200-Empplr Pd Ben-Medical	484111	72,091	74,975	77,974	81,093	84,336	87,710	91,218	94,867	98,662	102,608
399 603300-Employer Pd FICA	484111	45,157	46,963	48,842	50,795	52,827	54,940	57,138	59,423	61,800	64,272
400 603400-Unemployment	484111	5,792	5,937	6,085	6,237	6,393	6,553	6,717	6,885	7,057	7,233
401 603405-Workers' Compensation	484111	34,656	35,523	36,411	37,321	38,254	39,211	40,191	41,196	42,225	43,281
402 603900-Emp Benefits-Miscellaneous	484111	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
403 604100-Other Comp-Unused Sick Leave	484111	518	531	544	558	572	586	601	616	631	647
404 605100-Group Life Insurance	484111	1,554	1,616	1,681	1,748	1,818	1,891	1,966	2,045	2,127	2,212
405 605205-Eye Care-Active Civilian	484111	942	979	1,019	1,059	1,102	1,146	1,192	1,239	1,289	1,340
406 605500-Income Protection-LTD	484111	1,601	1,665	1,732	1,801	1,873	1,948	2,026	2,107	2,191	2,279
407 605620-Dental Active	484111	3,814	3,967	4,125	4,290	4,462	4,640	4,826	5,019	5,220	5,429
408 605700-Health Care Reserve - Civilian	484111	11,772	12,243	12,732	13,242	13,771	14,322	14,895	15,491	16,111	16,755
409 616100-Consultant Fees-Mgt Consult	484111	47,088	48,265	49,471	50,708	51,976	53,275	54,607	55,972	57,372	58,806
410 620100-Office Supplies	484111	7,063	7,240	7,421	7,606	7,796	7,991	8,191	8,396	8,606	8,821
411 621900-Oper Supplies-Miscellaneous	484111	1,884	1,931	1,979	2,028	2,079	2,131	2,184	2,239	2,295	2,352
412 626500-Dues & Miscellaneous	484111	753	772	792	811	832	852	874	896	918	941
413 626600-Postage	484111	942	965	989	1,014	1,040	1,066	1,092	1,119	1,147	1,176
414 627230-Employee Parking	484111	5,651	5,792	5,937	6,085	6,237	6,393	6,553	6,717	6,885	7,057
415 628100-Travel	484111	3,767	3,861	3,958	4,057	4,158	4,262	4,369	4,478	4,590	4,704
416 601100-Salar-Full Time-Gen City	484121	383,575	393,164	402,994	413,068	423,395	433,980	444,829	455,950	467,349	479,033
417 601300-Salar-Overtime-Gen City	484121	9,418	9,653	9,894	10,142	10,395	10,655	10,921	11,194	11,474	11,761
418 601400-Salar-Shift Prem-Gen City	484121	11,772	12,066	12,368	12,677	12,994	13,319	13,652	13,993	14,343	14,701
419 602100-Wages-Full Time-Gen City	484121	564,674	578,791	593,260	608,092	623,294	638,876	654,848	671,220	688,000	705,200
420 602300-Wages-Overtime-Gen City	484121	9,418	9,653	9,894	10,142	10,395	10,655	10,921	11,194	11,474	11,761
421 603125-Empplr Pd Pension-GRS	484121	47,417	48,603	49,818	51,063	52,340	53,648	54,989	56,364	57,773	59,218
422 603200-Empplr Pd Ben-Medical	484121	119,602	124,386	129,362	134,536	139,918	145,515	151,335	157,389	163,684	170,231
423 603300-Employer Pd FICA	484121	74,869	77,864	80,979	84,218	87,586	91,090	94,733	98,523	102,464	106,562
424 603400-Unemployment	484121	9,606	9,846	10,092	10,344	10,603	10,868	11,140	11,418	11,704	11,996
425 603405-Workers' Compensation	484121	57,447	58,883	60,355	61,864	63,411	64,996	66,621	68,286	69,993	71,743
426 603900-Emp Benefits-Miscellaneous	484121	3,908	4,006	4,106	4,209	4,314	4,422	4,532	4,646	4,762	4,881
427 604100-Other Comp-Unused Sick Leave	484121	895	917	940	963	988	1,012	1,038	1,063	1,090	1,117
428 605100-Group Life Insurance	484121	2,543	2,644	2,750	2,860	2,975	3,094	3,217	3,348	3,480	3,619
429 605205-Eye Care-Active Civilian	484121	1,554	1,616	1,681	1,748	1,818	1,891	1,966	2,045	2,127	2,212
430 605500-Income Protection-LTD	484121	2,637	2,742	2,852	2,966	3,085	3,208	3,337	3,470	3,609	3,753
431 605620-Dental Active	484121	6,404	6,660	6,926	7,204	7,492	7,791	8,103	8,427	8,764	9,115
432 605700-Health Care Reserve - Civilian	484121	19,588	20,372	21,187	22,034	22,916	23,832	24,786	25,777	26,808	27,880

Schedule 4: Cash Out

Object Description	Cost Center	FY 2023 <sup>1</sup>	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
433 616100-Consultant Fees-Mgt Consult	484121	47,088	48,265	49,471	50,708	51,976	53,275	54,607	55,972	57,372	58,806
434 617900-Contract Svcs-Other-Misc	484121	113,010	115,835	118,731	121,699	124,742	127,861	131,057	134,333	137,692	141,134
435 620100-Office Supplies	484121	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
436 621900-Oper Supplies-Miscellaneous	484121	5,651	5,792	5,937	6,085	6,237	6,393	6,553	6,717	6,885	7,057
437 626500-Dues & Miscellaneous	484121	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
438 627105-Private Car Reimbursements	484121	942	965	989	1,014	1,040	1,066	1,092	1,119	1,147	1,176
439 627225 - Other Operational Services - Misc	484121	942	965	989	1,014	1,040	1,066	1,092	1,119	1,147	1,176
440 627230-Employee Parking	484121	471	483	495	507	520	533	546	560	574	588
441 628100-Travel	484121	4,709	4,826	4,947	5,071	5,198	5,328	5,461	5,597	5,737	5,881
442 601100-Salar-Full Time-Gen City	484131	128,125	131,328	134,612	137,977	141,426	144,962	148,586	152,301	156,108	160,011
443 603125-Empplr Pd Pension-GRS	484131	6,404	6,564	6,728	6,896	7,069	7,245	7,427	7,612	7,803	7,998
444 603200-Empplr Pd Ben-Medical	484131	15,680	16,307	16,960	17,638	18,344	19,077	19,840	20,634	21,459	22,318
445 603300-Employer Pd FICA	484131	9,794	10,186	10,593	11,017	11,458	11,916	12,393	12,889	13,404	13,940
446 603400-Unemployment	484131	1,271	1,303	1,336	1,369	1,403	1,438	1,474	1,511	1,549	1,588
447 603405-Workers' Compensation	484131	7,534	7,722	7,915	8,113	8,316	8,524	8,737	8,956	9,179	9,409
448 603900-Emp Benefits-Miscellaneous	484131	518	531	544	558	572	586	601	616	631	647
449 604100-Other Comp-Unused Sick Leave	484131	141	145	148	152	156	160	164	168	172	176
450 605100-Group Life Insurance	484131	330	343	357	371	386	401	417	434	451	469
451 605205-Eye Care-Active Civilian	484131	188	196	204	212	220	229	238	248	258	268
452 605500-Income Protection-LTD	484131	330	343	357	371	386	401	417	434	451	469
453 605620-Dental Active	484131	800	833	866	900	936	974	1,013	1,053	1,096	1,139
454 605700-Health Care Reserve - Civilian	484131	2,543	2,644	2,750	2,860	2,975	3,094	3,217	3,346	3,480	3,619
455 616100 - Consultant Fees Mgt Consultant	484131	105,947	108,596	111,311	114,093	116,946	119,869	122,866	125,938	129,086	132,313
456 627225-Other Oper Svcs-Miscellaneous	484131	524,032	544,633	565,748	587,392	609,577	632,316	655,624	679,515	704,003	729,103
457 628100-Travel	484131	2,166	2,220	2,276	2,333	2,391	2,451	2,512	2,575	2,639	2,705
458 628515-Shared Services Expense	484131	117,719	122,428	127,325	132,418	137,714	143,223	148,952	154,910	161,106	167,551
459 601100-Salar-Full Time-Gen City	484151	86,971	89,145	91,374	93,658	95,999	98,399	100,859	103,381	105,965	108,614
460 601115-Salaries-Contractual	484151	43,509	44,597	45,712	46,854	48,026	49,226	50,457	51,718	53,011	54,337
461 603125-Empplr Pd Pension-GRS	484151	6,545	6,709	6,877	7,048	7,225	7,405	7,590	7,780	7,975	8,174
462 603200-Empplr Pd Ben-Medical	484151	15,963	16,601	17,265	17,956	18,674	19,421	20,198	21,006	21,846	22,720
463 603300-Employer Pd FICA	484151	9,983	10,382	10,797	11,229	11,678	12,145	12,631	13,136	13,662	14,208
464 603400-Unemployment	484151	1,271	1,303	1,336	1,369	1,403	1,438	1,474	1,511	1,549	1,588
465 603405-Workers' Compensation	484151	7,675	7,867	8,064	8,265	8,472	8,684	8,901	9,123	9,352	9,585
466 603900-Emp Benefits-Miscellaneous	484151	518	531	544	558	572	586	601	616	631	647
467 604100-Other Comp-Unused Sick Leave	484151	141	145	148	152	156	160	164	168	172	176
468 605100-Group Life Insurance	484151	330	343	357	371	386	401	417	434	451	469
469 605205-Eye Care-Active Civilian	484151	188	196	204	212	220	229	238	248	258	268
470 605500-Income Protection-LTD	484151	330	343	357	371	386	401	417	434	451	469
471 605620-Dental Active	484151	848	881	917	953	992	1,031	1,072	1,115	1,160	1,206
472 605700-Health Care Reserve - Civilian	484151	2,637	2,742	2,852	2,966	3,085	3,208	3,337	3,470	3,609	3,753
473 626010-Advertising	484151	283	290	297	304	312	320	328	336	344	353
474 627105-Private Car Reimbursements	484151	47	48	49	51	52	53	55	56	57	59
475 601100-Salar-Full Time-Gen City	484161	121,755	124,799	127,919	131,117	134,395	137,755	141,199	144,729	148,347	152,056
476 602100-Wages-Full Time-Gen City	484161	161,902	165,950	170,098	174,351	178,710	183,177	187,757	192,451	197,262	202,194
477 603125-Empplr Pd Pension-GRS	484161	14,200	14,555	14,919	15,292	15,675	16,066	16,468	16,880	17,302	17,734
478 603200-Empplr Pd Ben-Medical	484161	34,654	36,040	37,481	38,981	40,540	42,161	43,848	45,602	47,426	49,323
479 603300-Employer Pd FICA	484161	21,710	22,578	23,481	24,420	25,397	26,413	27,470	28,568	29,711	30,900
480 603400-Unemployment	484161	2,805	2,875	2,947	3,021	3,096	3,174	3,253	3,334	3,418	3,503
481 603405-Workers' Compensation	484161	16,655	17,071	17,498	17,935	18,384	18,843	19,314	19,797	20,292	20,800
482 603900-Emp Benefits-Miscellaneous	484161	1,140	1,168	1,197	1,227	1,258	1,289	1,322	1,355	1,388	1,423
483 604100-Other Comp-Unused Sick Leave	484161	263	270	276	283	290	298	305	313	320	328
484 605100-Group Life Insurance	484161	760	790	822	855	889	924	961	1,000	1,040	1,081
485 605205-Eye Care-Active Civilian	484161	468	486	506	526	547	569	592	615	640	665
486 605500-Income Protection-LTD	484161	760	790	822	855	889	924	961	1,000	1,040	1,081
487 605620-Dental Active	484161	1,841	1,914	1,991	2,071	2,153	2,240	2,329	2,422	2,519	2,620
488 605700-Health Care Reserve - Civilian	484161	5,668	5,895	6,131	6,376	6,631	6,897	7,172	7,459	7,758	8,068
489 617900-Contract Svcs-Other-Misc	484161	794,755	814,624	834,990	855,865	877,261	899,193	921,673	944,714	968,332	992,540
490 617903 - Contract Svcs-Pers Servs Contract-Pd On P/R	484161	31,849	32,645	33,461	34,298	35,155	36,034	36,935	37,858	38,804	39,775
491 620100 - Office Supplies	484161	1,461	1,497	1,535	1,573	1,613	1,653	1,694	1,737	1,780	1,825
492 626600 - Postage	484161	1,461	1,497	1,535	1,573	1,613	1,653	1,694	1,737	1,780	1,825
493 627230-Employee Parking	484161	2,104	2,156	2,210	2,266	2,322	2,380	2,440	2,501	2,563	2,627
494 628100-Travel	484161	2,045	2,096	2,149	2,203	2,258	2,314	2,372	2,431	2,492	2,554
495 601100 - Salaries-Full Time	484171	47,088	48,265	49,471	50,708	51,976	53,275	54,607	55,972	57,372	58,806
496 603125 - Pensions DBP/DCP	484171	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
497 603200 - Empl Ben-Hospitalization	484171	5,792	6,023	6,264	6,515	6,776	7,047	7,328	7,622	7,926	8,243
498 603300 - Empl Ben-Social Security	484171	3,626	3,771	3,922	4,078	4,242	4,411	4,588	4,771	4,962	5,161
499 603400 - Unemployment	484171	471	483	495	507	520	533	546	560	574	588
500 603405 - Workers Compensation	484171	2,778	2,848	2,919	2,992	3,067	3,143	3,222	3,302	3,385	3,470
501 603900 - Empl Ben-Miscellaneous	484171	188	193	198	203	208	213	218	224	229	235
502 604100 - Other Comp-Unused Sick Leave	484171	94	97	99	101	104	107	109	112	115	118
503 605100 - Group Life Insurance	484171	141	147	153	159	165	172	179	186	193	201
504 605500 - Income Protection	484171	141	147	153	159	165	172	179	186	193	201

Schedule 4: Cash Out

Object Description	Cost Center	FY 2023 <sup>1</sup>	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
505 605620 - Dental Active	484171	330	343	357	371	386	401	417	434	451	469
506 605700 - Health Care Reserve	484171	942	979	1,019	1,059	1,102	1,146	1,192	1,239	1,289	1,340
507 611200 - Audit	484171	211,894	217,191	222,621	228,187	233,891	239,738	245,732	251,875	258,172	264,626
508 626500 - Dues & Miscellaneous	484171	471	483	495	507	520	533	546	560	574	588
509 627230 - Employee Parking	484171	1,695	1,738	1,781	1,825	1,871	1,918	1,966	2,015	2,065	2,117
510 628100 - Travel	484171	2,354	2,413	2,474	2,535	2,599	2,664	2,730	2,799	2,869	2,940
511 601100-Salar-Full Time-Gen City	485111	147,380	151,065	154,841	158,713	162,680	166,747	170,916	175,189	179,569	184,058
512 602100-Wages-Full Time-Gen City	485111	903,947	926,545	949,709	973,452	997,788	1,022,733	1,048,301	1,074,508	1,101,371	1,128,905
513 603125-Empir Pd Pension-GRS	485111	52,565	53,879	55,226	56,607	58,022	59,472	60,959	62,483	64,045	65,646
514 603200-Empir Pd Ben-Medical	485111	128,476	133,615	138,959	144,518	150,298	156,310	162,563	169,065	175,828	182,861
515 603300-Employer Pd FICA	485111	80,440	83,657	87,004	90,484	94,103	97,867	101,782	105,853	110,087	114,491
516 603400-Unemployment	485111	10,314	10,572	10,836	11,107	11,385	11,670	11,961	12,260	12,567	12,881
517 603405-Workers' Compensation	485111	61,710	63,253	64,835	66,455	68,117	69,820	71,565	73,354	75,188	77,068
518 603900-Emp Benefits-Miscellaneous	485111	4,208	4,313	4,421	4,531	4,644	4,760	4,879	5,001	5,126	5,255
519 604100-Other Comp-Unused Sick Leave	485111	964	988	1,013	1,038	1,064	1,091	1,118	1,146	1,175	1,204
520 605100-Group Life Insurance	485111	2,717	2,826	2,939	3,057	3,179	3,306	3,438	3,576	3,719	3,868
521 605205-Eye Care-Active Civilian	485111	1,665	1,732	1,801	1,873	1,948	2,026	2,107	2,192	2,279	2,370
522 605500-Income Protection-LTD	485111	2,834	2,948	3,066	3,188	3,316	3,448	3,586	3,730	3,879	4,034
523 605620-Dental Active	485111	6,837	7,111	7,395	7,691	7,999	8,319	8,651	8,997	9,357	9,732
524 605700-Health Care Reserve - Civilian	485111	21,038	21,879	22,754	23,664	24,611	25,596	26,619	27,684	28,791	29,943
525 617900-Contract Svcs-Other-Misc	485111	21,914	22,462	23,024	23,599	24,189	24,794	25,414	26,049	26,700	27,368
526 626100-Printing	485111	2,922	2,995	3,070	3,147	3,225	3,306	3,389	3,473	3,560	3,649
527 626500-Dues & Miscellaneous	485111	1,169	1,198	1,228	1,259	1,290	1,322	1,355	1,389	1,424	1,460
528 626600-Postage	485111	4,675	4,792	4,912	5,034	5,160	5,289	5,422	5,557	5,696	5,838
529 627230-Employee Parking	485111	1,052	1,078	1,105	1,133	1,161	1,190	1,220	1,250	1,282	1,314
530 603121 - Pension Reimbursement - Operating (GLWA's portion) <sup>2</sup>	487111	6,048,000	-	-	-	-	-	-	-	-	-
531 603121-Pension Reimbursement - Operating <sup>2</sup>	487111	4,272,000	-	-	-	-	-	-	-	-	-
532 628512-GLWA Charge	487111	22,985,900	24,674,808	26,431,280	28,258,011	30,157,789	32,133,588	34,188,474	36,325,516	38,548,057	40,858,057
533 628513-Other GLWA Allocations <sup>2</sup>	487111	3,809,200	1,977,778	1,977,778	1,977,778	1,977,778	1,977,778	1,977,778	1,977,778	1,977,778	1,977,778
534 628514-Other Retail Allocations <sup>2</sup>	487111	5,392,800	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000	2,800,000
535 651180-Note Payment <sup>2</sup>	487111	875,500	875,508	1,653,309	1,622,197	1,447,403	1,306,706	1,275,594	1,244,482	1,213,370	1,182,258
536 651180-Note Payment <sup>2</sup>	487111	618,200	618,193	1,167,396	1,145,428	1,022,006	922,660	900,692	878,724	856,756	834,788
537 711700-Bad Debts <sup>3</sup>	487111	12,766,714	12,766,714	13,107,367	13,459,217	11,058,151	11,358,582	11,669,034	11,989,893	12,321,559	12,664,450
538 720300-Water Retail Assistance Program	487111	614,460	856,400	873,400	890,900	908,800	927,100	946,000	965,300	985,200	1,005,600
<b>539 Total Operating and Non-Operating Expenses</b>		<b>\$ 100,714,413</b>	<b>\$ 89,064,143</b>	<b>\$ 93,700,879</b>	<b>\$ 97,072,943</b>	<b>\$ 97,554,836</b>	<b>\$ 100,908,263</b>	<b>\$ 104,574,846</b>	<b>\$ 108,371,946</b>	<b>\$ 112,304,615</b>	<b>\$ 114,066,270</b>
<b>Total Expenses by Category</b>											
540 Personal Services		\$ 23,225,402	\$ 23,864,436	\$ 24,521,782	\$ 25,197,990	\$ 25,893,631	\$ 26,609,290	\$ 27,345,573	\$ 28,103,106	\$ 28,882,532	\$ 29,684,518
541 Operations & Maintenance		77,489,011	65,199,707	69,179,098	71,874,953	71,661,205	74,298,973	77,229,273	80,268,840	83,422,083	84,381,751
<b>542 Total Expenses</b>		<b>\$ 100,714,413</b>	<b>\$ 89,064,143</b>	<b>\$ 93,700,879</b>	<b>\$ 97,072,943</b>	<b>\$ 97,554,836</b>	<b>\$ 100,908,263</b>	<b>\$ 104,574,846</b>	<b>\$ 108,371,946</b>	<b>\$ 112,304,615</b>	<b>\$ 114,066,270</b>
<b>Expense Execution Factors</b>											
543 Personal Services		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
544 Operations & Maintenance		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Total Expenses at Execution</b>											
545 Personal Services		\$ 23,225,402	\$ 23,864,436	\$ 24,521,782	\$ 25,197,990	\$ 25,893,631	\$ 26,609,290	\$ 27,345,573	\$ 28,103,106	\$ 28,882,532	\$ 29,684,518
546 Operations & Maintenance		77,489,011	65,199,707	69,179,098	71,874,953	71,661,205	74,298,973	77,229,273	80,268,840	83,422,083	84,381,751
<b>547 Total Expenses at Execution</b>		<b>\$ 100,714,413</b>	<b>\$ 89,064,143</b>	<b>\$ 93,700,879</b>	<b>\$ 97,072,943</b>	<b>\$ 97,554,836</b>	<b>\$ 100,908,263</b>	<b>\$ 104,574,846</b>	<b>\$ 108,371,946</b>	<b>\$ 112,304,615</b>	<b>\$ 114,066,270</b>
<b>Debt Service</b>											
548 Obligation to GLWA		\$ 33,438,800	\$ 33,438,800	\$ 33,438,800	\$ 33,438,800	\$ 33,438,800	\$ 33,438,800	\$ 33,438,800	\$ 33,438,800	\$ 33,438,800	\$ 33,438,800
549 Model Calculated New Subordinate Debt Service				133,480	596,160	1,157,649	1,963,203	3,194,792	4,152,914	5,111,036	6,069,158
<b>550 Total Debt Service</b>		<b>\$ 33,438,800</b>	<b>\$ 33,438,800</b>	<b>\$ 33,438,800</b>	<b>\$ 33,438,800</b>	<b>\$ 33,438,800</b>	<b>\$ 33,438,800</b>	<b>\$ 33,438,800</b>	<b>\$ 33,438,800</b>	<b>\$ 33,438,800</b>	<b>\$ 35,654,781</b>
<b>Transfer to I&amp;E Fund</b>											
551 Transfer to I&E Fund from Operations		\$ 6,580,230	\$ 13,211,113	\$ 13,034,144	\$ 13,420,630	\$ 16,517,205	\$ 16,903,734	\$ 17,216,775	\$ 17,534,389	\$ 17,856,743	\$ 18,279,880
<b>552 Total Cash-Funded Capital</b>		<b>\$ 6,580,230</b>	<b>\$ 13,211,113</b>	<b>\$ 13,034,144</b>	<b>\$ 13,420,630</b>	<b>\$ 16,517,205</b>	<b>\$ 16,903,734</b>	<b>\$ 17,216,775</b>	<b>\$ 17,534,389</b>	<b>\$ 17,856,743</b>	<b>\$ 18,279,880</b>
<b>553 Total Cash Outflows</b>		<b>\$ 140,733,443</b>	<b>\$ 135,714,056</b>	<b>\$ 140,173,823</b>	<b>\$ 143,932,373</b>	<b>\$ 147,510,841</b>	<b>\$ 151,250,797</b>	<b>\$ 155,230,421</b>	<b>\$ 159,345,135</b>	<b>\$ 163,600,158</b>	<b>\$ 168,000,931</b>

<sup>1</sup> FY 2023 based on FY 2023 Approved Budget.

<sup>2</sup> Forecast based on future pension obligations.

<sup>3</sup> Bad debt calculated as 10% of water rate revenue through FY 2026; 8% of water rate revenue in FY 2027 through FY 2032.

# Schedule 5: Cost Escalation Factors

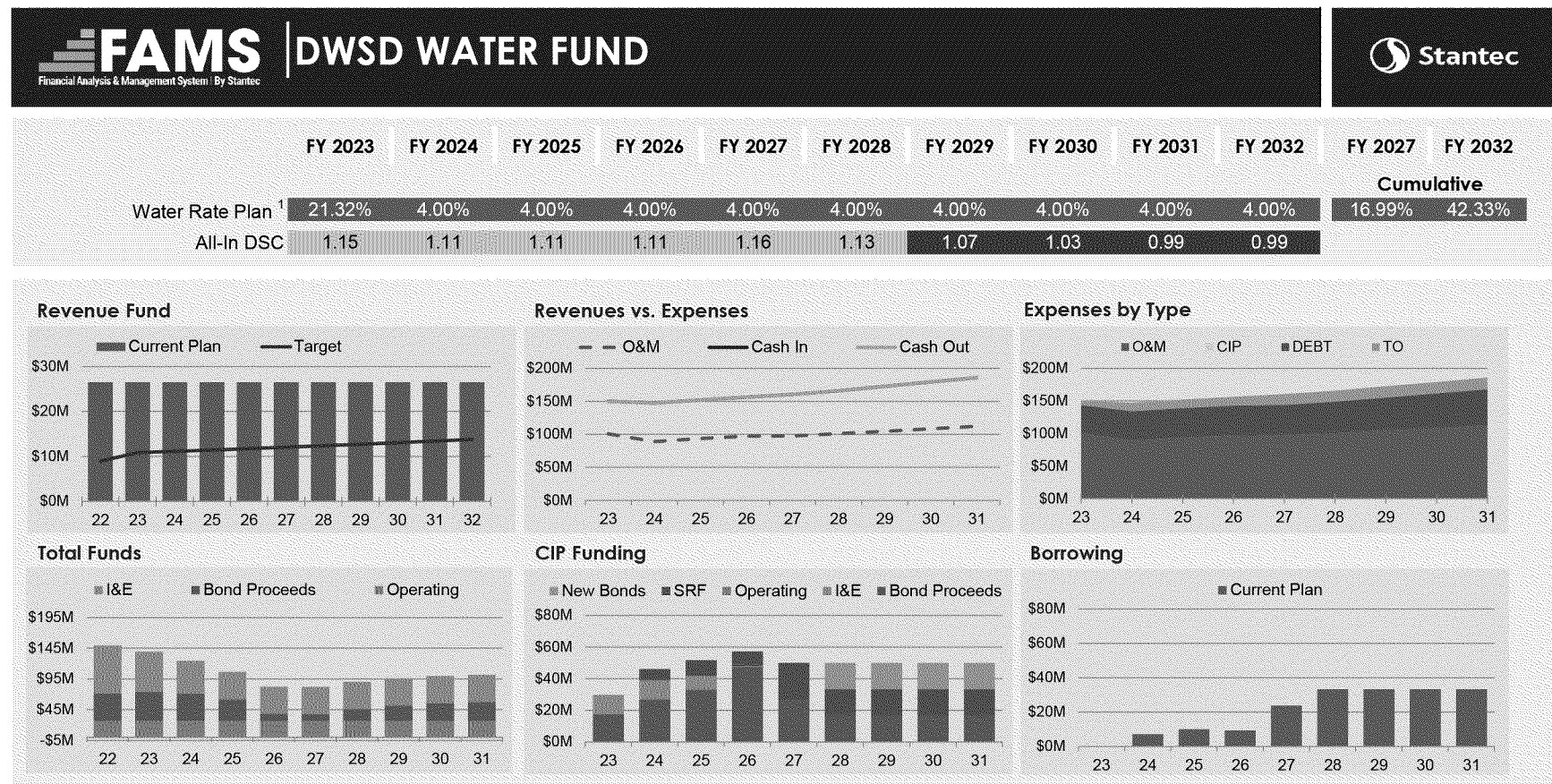
Object #	Object Description	Inflation Factor	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
601100	Salar-Full Time-Gen City	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
601200	Wages-Full Time	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
601300	Salar-Overtime-Gen City	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
601400	Salar-Shift Prem-Gen City	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
601500	Salaries-Holiday Premium	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
602100	Wages-Full Time-Gen City	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
602130	Wages-Holiday Pay	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
602300	Wages-Overtime-Gen City	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
602400	Wages-Shift Prem-Gen City	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
603121	Pension Reimbursement - Operating	Retirement	-100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
603125	Emplr Pd Pension-GRS	Retirement	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
603200	Emplr Pd Ben-Medical	Health Insurance	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
603300	Employer Pd FICA	Health Insurance	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
603400	Unemployment	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
603405	Workers' Compensation	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
603900	Emp Benefits-Miscellaneous	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
604100	Other Comp-Unused Sick Leave	Salaries & Wages	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
605100	Group Life Insurance	Health Insurance	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
605205	Eye Care-Active Civilian	Health Insurance	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
605500	Income Protection	Health Insurance	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
605620	Dental Active	Health Insurance	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
605700	Health Care Reserve - Civilian	Health Insurance	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
611200	Auditing	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
613100	Legal	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
616100	Consultant Fees-Mgt Consult	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
617400	Contract Svcs-Info Technology	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
617900	Contract Svcs-Other-Misc	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
617903	Contract Svcs-Pers Servs Contract-Pd On P/R	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
620100	Office Supplies	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
621300	Oper Supplies-Automotive	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
621400	Oper Supplies-Janitorial	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
621600	Operating Supplies-Chemicals	Fuel, Utilities, Chemicals	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
621900	Oper Supplies-Miscellaneous	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
622100	Repairs & Maint-Automotive	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
622200	Repairs & Maint-Bldgs&Ground	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
622300	Repairs & Maint-Equipment	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
622301	Hardware Maintenance	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
622302	Software Maintenance	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
622400	Repairs & Maint-Facilities	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
622900	Repairs & Maint-Misc	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
623100	Uniforms, Laundry, Cleaning	Repair & Maintenance	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626010	Advertising	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626100	Printing	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626300	Insurance Premium	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626415	Rentals- Office Equipment	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626435	Rentals - Lease of Equipment	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626500	Dues & Miscellaneous	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626600	Postage	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626700	Telecommunications	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626702	Data Com Equip	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626801	Utilities-Water	Fuel, Utilities, Chemicals	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626802	Utilities-Gas	Fuel, Utilities, Chemicals	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626803	Utilities-Steam	Fuel, Utilities, Chemicals	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
626804	Utilities-Electricity	Fuel, Utilities, Chemicals	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
627105	Private Car Reimbursements	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
627110	Purchased Services - Other	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
627195	Employee Uniform Expense	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
627225	Other Oper Svc-Miscellaneous	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
627230	Employee Parking	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
628100	Travel	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
628200	Training	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
628208	Training-Tuition Reimbursement	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
628501	Misc-License,Insp&Permit Fees	Admin Services	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
628512	GLWA Charge	N/A									
628513	Other GLWA Allocations	N/A									
628514	Other Retail Allocations	N/A									
628515	Shared Services Expense	GLWA	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
651180	Note Payment	N/A									
661100	Damage Claims	No Escalation	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
711700	Bad Debts	N/A									
720300	Water Retail Assistance Program	No Escalation	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Schedule 6. Capital Improvement Program

Capital Improvement Projects <sup>1</sup>	Funding Source	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	Total Cost
1 WS-711 Water Main Replacement- Incl Jefferson Streetscape	New DWRF Funded	\$ 1,814,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,814,000
2 WS-712 Water Main Replacement-Cornerstone Village	Prior Bond Proceeds	1,000,000	-	-	-	-	-	-	-	-	-	1,000,000
3 WS-713 Water Main Replacement-Jefferson/Chalmers	New DWRF Funded	7,250,000	2,000,000	-	-	-	-	-	-	-	-	9,250,000
4 WS-715 Pilot Areas-Riverdale, Minock, Miller & Rosedale	New DWRF Funded	5,000,000	100,000	-	-	-	-	-	-	-	-	5,100,000
5 WS-720 Watermain Replacement-Various Streets	Prior Bond Proceeds	6,000,000	3,000,000	2,700,000	-	-	-	-	-	-	-	11,700,000
6 WS-721 Lead Service Line Replacement	100% Forgiveness or Grant	5,000,000	4,000,000	-	-	-	-	-	-	-	-	9,000,000
7 WS-723 Lead Service Line Replacement for Settlements	100% Forgiveness or Grant	800,000	-	-	-	-	-	-	-	-	-	800,000
8 WS-725 Watermain Replacement-Medical Ctr, Cultural Ctr & Midtown 30,000LF	Prior Bond Proceeds	4,000,000	5,000,000	5,000,000	-	-	-	-	-	-	-	14,000,000
9 WS-732 Water Main Replacement, Various Locations - Detroit West	New DWRF Funded	-	2,750,000	5,000,000	4,000,000	-	-	-	-	-	-	11,750,000
10 WS-732 Water Main Replacement, Various Locations - Detroit East	New DWRF Funded	-	2,250,000	5,000,000	4,000,000	-	-	-	-	-	-	11,250,000
11 WS-717 Repair & Replacement of Water Mains (WS-702B)	Operations	2,500,000	3,000,000	3,000,000	-	-	-	-	-	-	-	8,500,000
12 WS-719 Repair of Water Mains (WS-708/WS-702A) incl r	Operations	9,179,000	6,000,000	4,000,000	291,000	-	-	-	-	-	-	19,470,000
13 DWS-904 Repair of Lawns (break repair)	Operations	200,000	425,000	-	-	-	-	-	-	-	-	625,000
14 DWS-919 (replace DWS-902)	Operations	2,500,000	5,100,000	2,720,000	-	-	-	-	-	-	-	10,320,000
15 PC-808 West Warren (Constance at Rouge Park/Tireman Sawyer PH III)	Prior Bond Proceeds	1,300,000	4,000,000	864,000	565,000	-	-	-	-	-	-	6,729,000
16 CS-1921 Watermain/Sewer Design	I&E Funded	1,000,000	1,000,000	-	-	-	-	-	-	-	-	2,000,000
17 CS-1923 Third Party Inspection (Water & Sewer)	I&E Funded	750,000	1,500,000	-	-	-	-	-	-	-	-	2,250,000
18 CS-1947 Condition Assessment Sherwood Forest,	I&E Funded	250,000	-	-	-	-	-	-	-	-	-	250,000
19 CS-1812 Professional Engineering and Construction Services for CIPMO	I&E Funded	4,000,000	-	-	-	-	-	-	-	-	-	4,000,000
20 Construction Program Management Allowances	I&E Funded	-	1,000,000	750,000	750,000	750,000	-	-	-	-	-	3,250,000
21 Watermain Program Allowances	I&E Funded	-	9,000,000	13,000,000	22,000,000	30,000,000	-	-	-	-	-	74,000,000
22 PC-803B Meter Installation	I&E Funded	700,000	700,000	-	-	-	-	-	-	-	-	1,400,000
23 Water Meter Replacement Program	I&E Funded	850,000	850,000	850,000	850,000	850,000	-	-	-	-	-	4,250,000
24 Fire Hydrant Replacement Program	I&E Funded	250,000	250,000	250,000	250,000	250,000	-	-	-	-	-	1,250,000
25 CS-1925 Itron Migration -MIU Replacement	I&E Funded	350,000	14,890,000	3,000,000	-	-	-	-	-	-	-	18,240,000
26 CS-1926 Itron Migration Project Management	I&E Funded	560,000	1,115,000	-	-	-	-	-	-	-	-	1,675,000
27 Vehicle, Heavy Equipment, and Equipment Purchases	I&E Funded	981,000	500,000	750,000	1,200,000	750,000	-	-	-	-	-	4,181,000
28 Information Technology	I&E Funded	2,688,000	500,000	500,000	500,000	500,000	-	-	-	-	-	4,688,000
29 Facility Improvement Allowance	I&E Funded	1,463,000	500,000	500,000	500,000	1,000,000	-	-	-	-	-	3,963,000
30 Unspecified Future Spending: Cash	I&E / Operating Fund	-	-	-	-	-	16,666,667	16,666,667	16,666,667	16,666,667	16,666,667	83,333,333
31 Unspecified Future Spending: Bond	New Bond Funded	-	-	-	-	-	16,666,667	16,666,667	16,666,667	16,666,667	16,666,667	83,333,333
32 Unspecified Future Spending: SRF	New DWRF Funded	-	-	-	-	-	16,666,667	16,666,667	16,666,667	16,666,667	16,666,667	83,333,333
33 WS-734 Emergency Watermain Break Repair	I&E Funded	450,000	-	-	-	-	-	-	-	-	-	450,000
34 <b>Total CIP Budget (in current dollars)</b>		<b>\$ 60,635,000</b>	<b>\$ 69,430,000</b>	<b>\$ 47,884,000</b>	<b>\$ 34,906,000</b>	<b>\$ 34,100,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 496,955,000</b>
35 <b>Annual CIP Execution Percentage <sup>2</sup></b>		<b>82%</b>	<b>72%</b>	<b>108%</b>	<b>164%</b>	<b>147%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	
36 <b>Final CIP Funding Level</b>		<b>\$ 49,493,280</b>	<b>\$ 50,094,304</b>	<b>\$ 51,709,998</b>	<b>\$ 57,287,974</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 508,585,556</b>

<sup>1</sup> Capital spending from FY 2023 through FY 2027 reflects 2023 5-Year CIP Plan BOWC Approved. Future CIP reflects estimated levels of spending.

<sup>2</sup> Annual CIP Execution Percentages are based on expected annual spending in each year of forecast.



<sup>1</sup> FY 2023 rates reflect results of cost allocation and rate design analyses. Total water, wastewater, and drainage rate revenue increase of 0.8% in FY 2023.

Schedule 8: Pro Forma

	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
<b>Operating Revenue</b>										
1 Water Rate Revenue	\$ 123,766,383	\$ 127,172,910	\$ 130,691,409	\$ 134,326,132	\$ 138,081,513	\$ 141,962,167	\$ 145,972,902	\$ 150,118,728	\$ 154,404,864	\$ 158,836,748
2 <i>Weighted Average Rate Increase</i>	<i>21.32%</i>	<i>4.00%</i>	<i>4.00%</i>	<i>4.00%</i>	<i>4.00%</i>	<i>4.00%</i>	<i>4.00%</i>	<i>4.00%</i>	<i>4.00%</i>	<i>4.00%</i>
3 Total Rate Revenue	\$ 123,766,383	\$ 127,172,910	\$ 130,691,409	\$ 134,326,132	\$ 138,081,513	\$ 141,962,167	\$ 145,972,902	\$ 150,118,728	\$ 154,404,864	\$ 158,836,748
4 Plus: Other Operating Revenue	3,900,760	3,900,760	3,900,760	3,900,760	3,900,760	3,900,760	3,900,760	3,900,760	3,900,760	3,900,760
5 <b>Equals: Total Operating Revenue</b>	<b>\$ 127,667,143</b>	<b>\$ 131,073,670</b>	<b>\$ 134,592,169</b>	<b>\$ 138,226,892</b>	<b>\$ 141,982,273</b>	<b>\$ 145,862,927</b>	<b>\$ 149,873,662</b>	<b>\$ 154,019,488</b>	<b>\$ 158,305,624</b>	<b>\$ 162,737,508</b>
<b>Less: Operating Expenses</b>										
6 Personal Services	\$ (23,225,402)	\$ (23,864,436)	\$ (24,521,782)	\$ (25,197,990)	\$ (25,893,631)	\$ (26,609,290)	\$ (27,345,573)	\$ (28,103,106)	\$ (28,882,532)	\$ (29,684,518)
7 Operations & Maintenance Costs	(77,489,011)	(65,199,707)	(69,179,098)	(71,874,953)	(71,661,205)	(74,298,973)	(77,229,273)	(80,268,840)	(83,422,083)	(84,381,751)
8 <b>Equals: Net Operating Income</b>	<b>\$ 26,952,730</b>	<b>\$ 42,009,527</b>	<b>\$ 40,891,289</b>	<b>\$ 41,153,949</b>	<b>\$ 44,427,437</b>	<b>\$ 44,954,663</b>	<b>\$ 45,298,816</b>	<b>\$ 45,647,542</b>	<b>\$ 46,001,009</b>	<b>\$ 48,671,238</b>
<b>Plus: Non-Operating Income/(Expense)</b>										
9 Non-Operating Revenue	\$ 13,066,300	\$ 4,425,508	\$ 5,203,309	\$ 5,172,197	\$ 4,997,403	\$ 4,856,706	\$ 4,825,594	\$ 4,794,482	\$ 4,763,370	\$ 4,732,258
10 Interest Income	-	214,878	378,345	533,284	531,165	531,165	531,165	531,165	531,165	531,165
11 <b>Equals: Net Income Available For Debt Service</b>	<b>\$ 40,019,030</b>	<b>\$ 46,649,913</b>	<b>\$ 46,472,944</b>	<b>\$ 46,859,430</b>	<b>\$ 49,956,005</b>	<b>\$ 50,342,534</b>	<b>\$ 50,655,575</b>	<b>\$ 50,973,189</b>	<b>\$ 51,295,544</b>	<b>\$ 53,934,661</b>
<b>Adjusted Debt Service Coverage</b>										
12 Revenue	\$ 128,417,143	\$ 132,038,548	\$ 135,720,514	\$ 139,510,176	\$ 143,263,438	\$ 147,144,092	\$ 151,154,827	\$ 155,300,653	\$ 159,586,789	\$ 164,018,673
13 Less: Operating Expenses	(79,084,253)	(81,936,264)	(85,228,996)	(88,636,640)	(89,398,849)	(92,974,019)	(96,674,762)	(100,505,662)	(104,471,511)	(106,265,846)
14 Net Revenue	49,332,890	50,102,284	50,491,517	50,873,536	53,864,589	54,170,073	54,480,045	54,794,991	55,115,277	57,752,827
15 <b>Total Debt Service</b>	<b>\$ 42,866,000</b>	<b>\$ 45,049,100</b>	<b>\$ 45,350,480</b>	<b>\$ 45,807,210</b>	<b>\$ 46,365,249</b>	<b>\$ 48,098,129</b>	<b>\$ 50,816,742</b>	<b>\$ 53,250,838</b>	<b>\$ 55,699,335</b>	<b>\$ 58,154,781</b>
16 <i>Debt Service Coverage</i>	<i>1.15</i>	<i>1.11</i>	<i>1.11</i>	<i>1.11</i>	<i>1.16</i>	<i>1.13</i>	<i>1.07</i>	<i>1.03</i>	<i>0.99</i>	<i>0.99</i>
17 Available for Other Requirements	\$ 6,466,890	\$ 5,053,184	\$ 5,141,037	\$ 5,066,326	\$ 7,499,340	\$ 6,071,944	\$ 3,863,303	\$ 1,544,152	\$ (584,057)	\$ (401,954)
18 Less: Pension Obligation	(8,699,400)	(2,595,971)	(3,145,174)	(3,123,206)	(2,999,784)	(2,900,438)	(2,878,470)	(2,856,502)	(2,834,534)	(2,812,566)
19 Less: WRAP Deposit	(614,460)	(856,400)	(873,400)	(890,900)	(908,800)	(927,100)	(946,000)	(965,300)	(985,200)	(1,005,600)
20 Available for I&E Deposit	(2,846,970)	1,600,813	1,122,464	1,052,221	3,590,756	2,244,406	(161,167)	(2,277,650)	(4,403,791)	(4,220,120)
21 <b>Net Effective Lease Payment to I&amp;E</b>	<b>\$ 19,653,030</b>	<b>\$ 22,500,000</b>	<b>\$ 22,500,000</b>	<b>\$ 22,500,000</b>	<b>\$ 22,500,000</b>	<b>\$ 22,500,000</b>	<b>\$ 22,338,833</b>	<b>\$ 20,222,350</b>	<b>\$ 18,096,209</b>	<b>\$ 18,279,880</b>
<b>Cash Flow Test</b>										
22 Net Income Available For Debt Service	\$ 40,019,030	\$ 46,649,913	\$ 46,472,944	\$ 46,859,430	\$ 49,956,005	\$ 50,342,534	\$ 50,655,575	\$ 50,973,189	\$ 51,295,544	\$ 53,934,661
23 Less: Non-Operating Expenditures	-	-	-	-	-	-	-	-	-	-
24 Payment to GLWA	(33,438,800)	(33,438,800)	(33,438,800)	(33,438,800)	(33,438,800)	(33,438,800)	(33,438,800)	(33,438,800)	(33,438,800)	(33,438,800)
25 Transfer to I&E	(6,580,230)	(13,211,113)	(13,034,144)	(13,420,630)	(16,517,205)	(16,903,734)	(17,216,775)	(17,534,389)	(17,856,743)	(18,279,880)
26 Debt Service Paid from Operating Fund	-	-	-	-	-	-	-	-	-	(2,215,981)
27 <b>Net Cash Flow</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Unrestricted Reserve Fund Test</b>										
28 Balance At Beginning Of Fiscal Year	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000
29 Cash Flow Surplus/(Deficit)	-	-	-	-	-	-	-	-	-	-
30 <b>Balance At End Of Fiscal Year</b>	<b>\$ 26,487,000</b>	<b>\$ 26,487,000</b>	<b>\$ 26,487,000</b>	<b>\$ 26,487,000</b>	<b>\$ 26,487,000</b>	<b>\$ 26,487,000</b>	<b>\$ 26,487,000</b>	<b>\$ 26,487,000</b>	<b>\$ 26,487,000</b>	<b>\$ 26,487,000</b>
31 Minimum Working Capital Reserve Target	10,832,910	11,123,685	11,422,587	11,729,853	12,045,727	12,370,462	12,704,318	13,047,563	13,400,474	13,763,335
32 <b>Excess/(Deficiency) Of Working Capital To Target</b>	<b>\$ 15,654,090</b>	<b>\$ 15,363,315</b>	<b>\$ 15,064,412</b>	<b>\$ 14,757,147</b>	<b>\$ 14,441,273</b>	<b>\$ 14,116,538</b>	<b>\$ 13,782,682</b>	<b>\$ 13,439,436</b>	<b>\$ 13,086,526</b>	<b>\$ 12,723,665</b>

Schedule 9: Capital Project Funding Summary

Final Capital Projects Funding Sources	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
I&E	\$ 17,529,280	\$ 26,994,304	\$ 33,145,998	\$ 47,434,900	\$ 26,264,691	\$ 16,666,667	\$ 16,666,667	\$ 16,666,667	\$ 16,666,667	\$ 16,666,667
Construction	12,300,000	12,000,000	8,564,000	565,000	-	-	-	-	-	-
Forgiveness/Grant	5,600,000	4,000,000	-	-	-	-	-	-	-	-
Subordinate Debt Proceeds	14,064,000	7,100,000	10,000,000	9,288,074	23,735,309	16,666,667	16,666,667	16,666,667	16,666,667	16,666,667
Senior-Lien Debt Proceeds	-	-	-	-	-	16,666,667	16,666,667	16,666,667	16,666,667	16,666,667
<b>Total Projects Paid</b>	<b>\$ 49,493,280</b>	<b>\$ 50,094,304</b>	<b>\$ 51,709,998</b>	<b>\$ 57,287,974</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>	<b>\$ 50,000,000</b>

## Schedule 10: Funding Summary by Fund

	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
<b>I&amp;E</b>										
Balance At Beginning Of Fiscal Year	\$ 45,113,000	\$ 47,236,750	\$ 44,457,734	\$ 35,132,680	\$ 11,423,935	\$ 11,335,027	\$ 19,528,070	\$ 25,367,967	\$ 29,127,245	\$ 30,780,602
GLWA Lease Revenue	22,500,000	22,500,000	22,500,000	22,500,000	22,500,000	22,500,000	22,500,000	22,500,000	22,500,000	22,500,000
Transfer from Operations	6,580,230	13,211,113	13,034,144	13,420,630	16,517,205	16,903,734	17,216,775	17,534,389	17,856,743	18,279,880
Payment of Post-Bifurcation Debt	(9,427,200)	(11,610,300)	(11,911,680)	(12,368,410)	(12,926,449)	(14,659,329)	(17,377,942)	(19,812,038)	(22,260,535)	(22,500,000)
Subtotal	\$ 64,766,030	\$ 71,337,563	\$ 68,080,198	\$ 58,684,900	\$ 37,514,691	\$ 36,079,432	\$ 41,866,903	\$ 45,590,318	\$ 47,223,453	\$ 49,060,482
Less: Restricted Funds	(11,250,000)	(11,250,000)	(11,250,000)	(11,250,000)	(11,250,000)	(11,250,000)	(11,250,000)	(11,250,000)	(11,250,000)	(11,250,000)
Total Amount Available For Projects	\$ 53,516,030	\$ 60,087,563	\$ 56,830,198	\$ 47,434,900	\$ 26,264,691	\$ 24,829,432	\$ 30,616,903	\$ 34,340,318	\$ 35,973,453	\$ 37,810,482
Amount Paid For Projects	(17,529,280)	(26,994,304)	(33,145,998)	(47,434,900)	(26,264,691)	(16,666,667)	(16,666,667)	(16,666,667)	(16,666,667)	(16,666,667)
Subtotal	\$ 35,986,750	\$ 33,093,259	\$ 23,684,200	\$ -	\$ -	\$ 8,162,766	\$ 13,950,236	\$ 17,673,651	\$ 19,306,787	\$ 21,143,815
Add Back: Restricted Funds	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000	11,250,000
Plus: Interest Earnings	-	114,475	198,480	173,935	85,027	115,304	167,731	203,594	223,815	236,904
Less: Interest Allocated To Cash Flow	-	-	-	-	-	-	-	-	-	-
Balance At End Of Fiscal Year	\$ 47,236,750	\$ 44,457,734	\$ 35,132,680	\$ 11,423,935	\$ 11,335,027	\$ 19,528,070	\$ 25,367,967	\$ 29,127,245	\$ 30,780,602	\$ 32,630,719
<b>Construction</b>										
Balance At Beginning Of Fiscal Year	\$ 77,764,000	\$ 65,464,000	\$ 53,464,000	\$ 44,900,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000
Amount Paid For Projects	(12,300,000)	(12,000,000)	(8,564,000)	(565,000)	-	-	-	-	-	-
Subtotal	\$ 65,464,000	\$ 53,464,000	\$ 44,900,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000
Add Back: Restricted Funds	-	-	-	-	-	-	-	-	-	-
Plus: Interest Earnings	-	148,660	245,910	334,631	332,513	332,513	332,513	332,513	332,513	332,513
Less: Interest Allocated To Cash Flow	-	(148,660)	(245,910)	(334,631)	(332,513)	(332,513)	(332,513)	(332,513)	(332,513)	(332,513)
Balance At End Of Fiscal Year	\$ 65,464,000	\$ 53,464,000	\$ 44,900,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000	\$ 44,335,000
<b>Forgiveness/Grant</b>										
Balance At Beginning Of Fiscal Year	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual Revenues	5,600,000	4,000,000	-	-	-	-	-	-	-	-
Less: Annual Expenses	-	-	-	-	-	-	-	-	-	-
Less: Payment Of Debt Service	-	-	-	-	-	-	-	-	-	-
Subtotal	\$ 5,600,000	\$ 4,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Less: Restricted Funds	-	-	-	-	-	-	-	-	-	-
Total Amount Available For Projects	\$ 5,600,000	\$ 4,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Amount Paid For Projects	(5,600,000)	(4,000,000)	-	-	-	-	-	-	-	-
Subtotal	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Add Back: Restricted Funds	-	-	-	-	-	-	-	-	-	-
Plus: Interest Earnings	-	-	-	-	-	-	-	-	-	-
Less: Interest Allocated To Cash Flow	-	-	-	-	-	-	-	-	-	-
Balance At End Of Fiscal Year	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Revenue Fund</b>										
Balance At Beginning Of Fiscal Year	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000
Net Cash Flow	6,580,230	13,211,113	13,034,144	13,420,630	16,517,205	16,903,734	17,216,775	17,534,389	17,856,744	18,279,880
Transfer to I&E	(6,580,230)	(13,211,113)	(13,034,144)	(13,420,630)	(16,517,205)	(16,903,734)	(17,216,775)	(17,534,389)	(17,856,743)	(18,279,880)
Less: Payment Of Debt Service	-	-	-	-	-	-	-	-	-	-
Subtotal	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000
Less: Restricted Funds	(10,832,910)	(11,123,685)	(11,422,587)	(11,729,853)	(12,045,727)	(12,370,462)	(12,704,318)	(13,047,563)	(13,400,474)	(13,763,335)
Subtotal	\$ 15,654,090	\$ 15,363,315	\$ 15,064,412	\$ 14,757,147	\$ 14,441,273	\$ 14,116,538	\$ 13,782,682	\$ 13,439,436	\$ 13,086,526	\$ 12,723,665
Add Back: Restricted Funds	10,832,910	11,123,685	11,422,587	11,729,853	12,045,727	12,370,462	12,704,318	13,047,563	13,400,474	13,763,335
Plus: Interest Earnings	-	66,218	132,435	198,652	198,652	198,653	198,653	198,652	198,653	198,653
Less: Interest Allocated To Cash Flow	-	(66,218)	(132,435)	(198,652)	(198,652)	(198,653)	(198,653)	(198,652)	(198,653)	(198,653)
Balance At End Of Fiscal Year	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000	\$ 26,487,000
<b>Restricted Reserves</b>										
Balance At Beginning Of Fiscal Year	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,491,948	\$ 2,995,086	\$ 4,509,498	\$ 6,035,267
Additional Funds:	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve On New Debt	-	-	-	-	-	1,486,374	1,486,374	1,486,374	1,486,374	1,486,374
Other Additional Funds	-	-	-	-	-	-	-	-	-	-
Subtotal	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,486,374	\$ 2,978,323	\$ 4,481,461	\$ 5,995,872	\$ 7,521,642
Plus: Interest Earnings	-	-	-	-	-	5,574	16,764	28,037	39,395	50,838
Less: Interest Allocated To Cash Flow	-	-	-	-	-	-	-	-	-	-
Balance At End Of Fiscal Year	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,491,948	\$ 2,995,086	\$ 4,509,498	\$ 6,035,267	\$ 7,572,480

Schedule 11: Senior Lien Borrowing Projections

		FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
Term (Years)		20	20	20	20	20	20	20	20	20	20
Interest Rate		5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
<b>Sources of Funds</b>											
Par Amount		\$ -	\$ -	\$ -	\$ -	\$ -	\$ 18,523,511	\$ 18,523,511	\$ 18,523,511	\$ 18,523,511	\$ 18,523,511
<b>Uses of Funds</b>											
Proceeds		\$ -	\$ -	\$ -	\$ -	\$ -	\$ 16,666,667	\$ 16,666,667	\$ 16,666,667	\$ 16,666,667	\$ 16,666,667
Cost of Issuance	2.00% of Par	-	-	-	-	-	370,470	370,470	370,470	370,470	370,470
Debt Service Reserve	1 Year(s) of Debt Service	-	-	-	-	-	1,486,374	1,486,374	1,486,374	1,486,374	1,486,374
Total Uses		\$ -	\$ -	\$ -	\$ -	\$ -	\$ 18,523,511	\$ 18,523,511	\$ 18,523,511	\$ 18,523,511	\$ 18,523,511
1 Year Interest		-	-	-	-	-	926,176	926,176	926,176	926,176	926,176
Annual Debt Service		\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,486,374	\$ 1,486,374	\$ 1,486,374	\$ 1,486,374	\$ 1,486,374
Total Debt Service		-	-	-	-	-	29,727,489	29,727,489	29,727,489	29,727,489	29,727,489
Cumulative New Annual Senior Lien Debt Service <sup>1</sup>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ 926,176	\$ 2,412,550	\$ 3,898,924	\$ 5,385,299	\$ 6,871,673

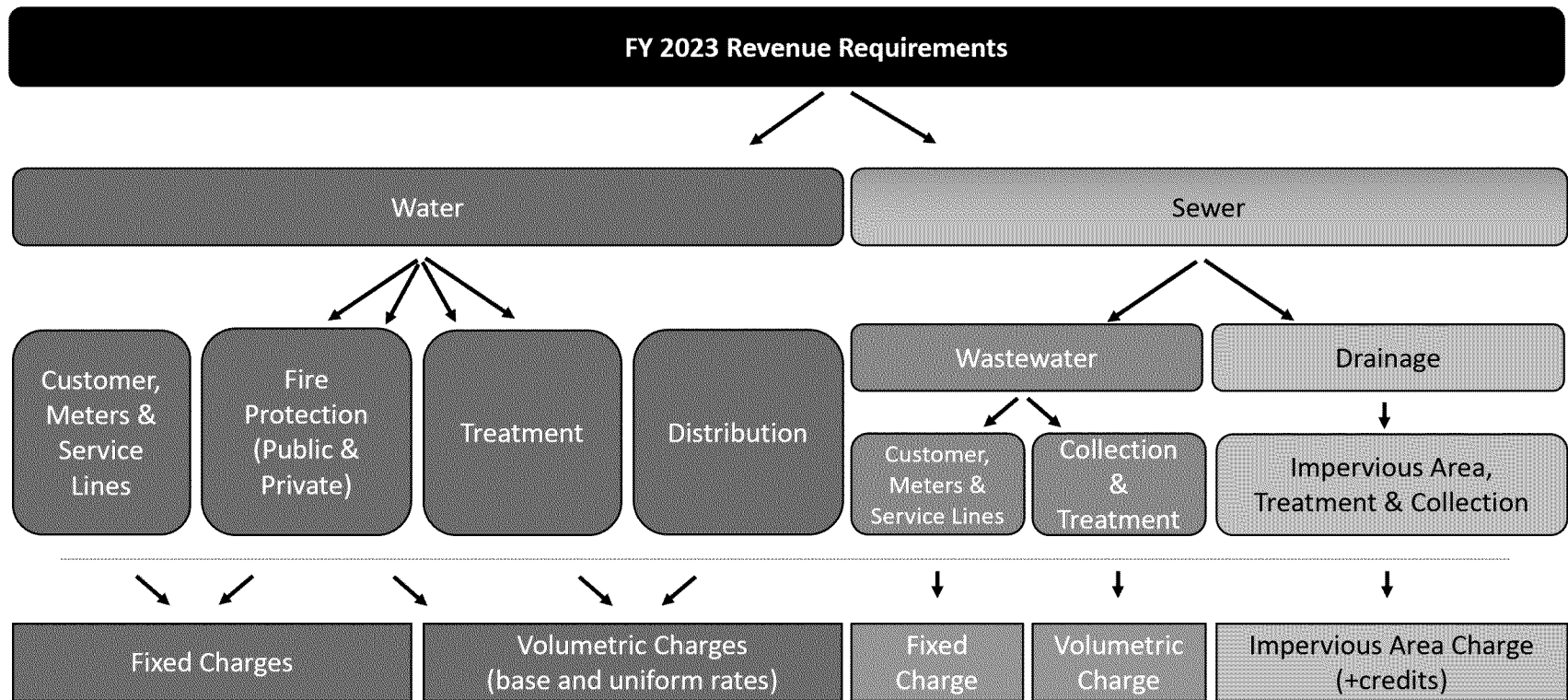
<sup>1</sup> Reflects interest-only payment due in year of issuance.

Schedule 12: Subordinate Borrowing Projections

		FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032
Term (Years)		20	20	20	20	20	20	20	20	20	20
Interest Rate		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
<b>Sources of Funds</b>											
Par Amount		\$ -	\$ 6,674,000	\$ 9,400,000	\$ 8,730,789	\$ 22,311,190	\$ 15,666,667	\$ 15,666,667	\$ 15,666,667	\$ 15,666,667	\$ 15,666,667
<b>Uses of Funds</b>											
Proceeds		\$ -	\$ 7,100,000	\$ 10,000,000	\$ 9,288,074	\$ 23,735,309	\$ 16,666,667	\$ 16,666,667	\$ 16,666,667	\$ 16,666,667	\$ 16,666,667
Cost of Issuance	0.00% of Par	-	-	-	-	-	-	-	-	-	-
Loan Repayment Res.	0.00% of Capital Cost	-	-	-	-	-	-	-	-	-	-
Loan Service Fee	2.00% of Capital Cost	-	142,000	200,000	185,761	474,706	333,333	333,333	333,333	333,333	333,333
Capitalized Interest	0 Years Interest	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve	0 Year(s) of Debt Service	-	-	-	-	-	-	-	-	-	-
Principal Forgiveness	8.00%	-	(568,000)	(800,000)	(743,046)	(1,898,825)	(1,333,333)	(1,333,333)	(1,333,333)	(1,333,333)	(1,333,333)
Total Uses		\$ -	\$ 6,674,000	\$ 9,400,000	\$ 8,730,789	\$ 22,311,190	\$ 15,666,667	\$ 15,666,667	\$ 15,666,667	\$ 15,666,667	\$ 15,666,667
1 Year Interest		-	133,480	188,000	174,616	446,224	313,333	313,333	313,333	313,333	313,333
Annual Debt Service		\$ -	\$ 408,160	\$ 574,873	\$ 533,946	\$ 1,364,479	\$ 958,122	\$ 958,122	\$ 958,122	\$ 958,122	\$ 958,122
Total Debt Service		-	8,163,199	11,497,463	10,678,928	27,289,584	19,162,438	19,162,438	19,162,438	19,162,438	19,162,438
Cumulative New Annual Subordinate Debt Service <sup>1</sup>		\$ -	\$ -	\$ 133,480	\$ 596,160	\$ 1,157,649	\$ 1,963,203	\$ 3,194,792	\$ 4,152,914	\$ 5,111,036	\$ 6,069,158

<sup>1</sup> Debt service repayment delayed two years.

## APPENDIX C: COST ALLOCATION SUPPORTING SCHEDULES



Schedule 2: Allocation Factors

System Cost Allocation Factors	Note	Factors	
		Water	Sewer
Water Only		100.0%	0.0%
FY 2020 Accounts (Water & Sewer)	1	50.2%	49.8%
FY 2020 Accounts	1	29.2%	70.8%
Maintenance Hours	2	50.5%	49.5%
5-Year CIP (FY22-26)	3	52.9%	47.1%
FY 23-26 M&R	4	84.6%	15.4%
Information Technology	5	38.2%	61.8%
Storm Drainage / Permitting CC	6	23.5%	76.5%
Weighted Expense	7	47.1%	52.9%
FY 2023 Revenue Requirement	8	29.2%	70.8%

Sewer Cost Allocation Factors	Note	Factors	
		Wastewater	Drainage
Wastewater Only		100.0%	0.0%
Drainage Only		0.0%	100.0%
FY 2020 Accounts	1	40.9%	59.1%
Information Technology	5	53.2%	46.8%
Storm Drainage / Permitting CC	6	32.7%	67.3%
Wet Weather Percent of Flow	9	69.1%	30.9%
Peak Flow Ratios	10	15.0%	85.0%
Weighted GLWA Expense	11	43.7%	56.3%
Weighted Expense	12	65.4%	34.6%
FY 2023 Revenue Requirement	8	44.3%	55.7%

Wastewater Cost Allocation Factors	Note	Factors			
		Treatment	Collection	Meters & Service Lines	Customer
Treatment Only		100.0%	0.0%	0.0%	0.0%
Collection Only		0.0%	100.0%	0.0%	0.0%
Meters & Service Lines Only		0.0%	0.0%	100.0%	0.0%
Customer Only		0.0%	0.0%	0.0%	100.0%
Weighted Internal	13	0.0%	70.2%	15.8%	14.0%

Water Cost Allocation Factors	Note	Factors				
		Treatment	Distribution	Meters & Service Lines	Customer	Fire Protection
Treatment Only		100.0%	0.0%	0.0%	0.0%	0.0%
Distribution Only		0.0%	100.0%	0.0%	0.0%	0.0%
Meters & Service Lines Only		0.0%	0.0%	100.0%	0.0%	0.0%
Customer Only		0.0%	0.0%	0.0%	100.0%	0.0%
Maintenance & Repair	14	0.0%	91.3%	0.0%	0.0%	8.7%
Weighted Internal	15	0.0%	76.2%	13.2%	10.7%	0.0%

(1) Reflect FY 2020 billed accounts of 181,807 for water, 180,085 for wastewater, and 260,330 for drainage. Combined sewer (wastewater and drainage accounts of 440,415).

(2) Maintenance Hours allocation shown in Schedule 13.

(3) 5-Year CIP allocation based on 2022 5-Year CIP Plan, shown in Schedule 14.

(4) FY 2023 M&R allocation based on FY 2023 projects funded through operations, shown in Schedule 14.

(5) Information Technology allocation based on 50% Weighted Expense allocation and 50% FY 2020 Accounts direct allocation.

(6) Storm Drainage / Permitting Cost Center allocation based on 50% Weighted Expense allocation and 50% Drainage direct allocation

(7) Weighted Expense based on results of direct allocations to Water/Sewer, shown in Schedule 3.

(8) FY 2023 Revenue Requirement allocation based on initial revenue requirement of \$110,999,669 to water, \$119,409,132 to wastewater, and \$150,203,140 to drainage shown in Schedule 11. Combined sewer (wastewater and drainage) revenue requirement of \$269,612,271.

(9) Wet Weather Percent of Flow allocation shown in Schedule 12.

(10) Peak Flow Ratios based on assumed design capacity based on CDM 2021 Flow report.

(11) Weighted GLWA allocation shown in Schedule 12.

(12) Weighted Expense based on results of direct allocations to Wastewater/Drainage, shown in Schedule 4a.

(13) Weighted Internal based on results of direct allocations to Collection/Meters & Service Lines/Customer (DWSD functions), shown in Schedule 5.

(14) Based on total FTEs in maintenance and repair and FTEs needed for hydrant activities per maintenance hours on Schedule 13.

(15) Weighted Internal based on results of direct allocations to Distribution/Meters & Service Lines/Customer (DWSD functions), shown in Schedule 6.

Schedule 3: Revenue Requirements Allocation to Water & Sewer

Apprn. Description	Center	Cost Center Description	FY 2023 Expense for COSA	Allocation Factor	Allocations Water	Sewer	\$ Water	\$ Sewer
Operating Expenses								
Administration	1001	Chief Exec Officer	\$ 1,703,900	Weighted Expense	47.1%	52.9%	\$ 802,324	\$ 901,576
Administration	1601	BOWC	\$ 357,800	Weighted Expense	47.1%	52.9%	\$ 168,479	\$ 189,321
Operations	2401	Deputy Director Administration	\$ 3,624,700	5-Year CIP (FY22-26)	52.9%	47.1%	\$ 1,916,474	\$ 1,708,226
Operations	2411	Field Engineering	\$ 6,260,400	5-Year CIP (FY22-26)	52.9%	47.1%	\$ 3,310,037	\$ 2,950,363
Operations	2421	Facility Oper	\$ 8,413,000	Weighted Expense	47.1%	52.9%	\$ 3,961,474	\$ 4,451,526
Operations	2422	Fleet Operations	\$ 4,785,000	Maintenance Hours	50.5%	49.5%	\$ 2,418,049	\$ 2,366,951
Operations	2431	Maint & Repair	\$ 16,290,100	Maintenance Hours	50.5%	49.5%	\$ 8,232,028	\$ 8,058,072
Operations	2432	Meter Operations	\$ 6,042,800	FY 2020 Accounts (Water & Sewer)	50.2%	49.8%	\$ 3,035,773	\$ 3,007,027
Operations	2435	Lead Service	\$ 278,500	Water Only	100.0%	0.0%	\$ 278,500	\$ -
Compliance	3101	General Counsel	\$ 1,989,800	Weighted Expense	47.1%	52.9%	\$ 936,948	\$ 1,052,852
Compliance	3201	Org Development	\$ 1,570,300	Weighted Expense	47.1%	52.9%	\$ 739,416	\$ 830,884
Compliance	3301	Info Technology	\$ 13,925,300	Information Technology	38.2%	61.8%	\$ 5,312,953	\$ 8,612,347
Compliance	3411	Compliance-Security	\$ 3,865,800	Weighted Expense	47.1%	52.9%	\$ 1,820,310	\$ 2,045,490
Compliance	3421	Compliance-Public Affairs	\$ 1,862,400	Weighted Expense	47.1%	52.9%	\$ 876,958	\$ 985,442
Finance	4001	Chief Financial Officer	\$ 4,255,200	Weighted Expense	47.1%	52.9%	\$ 2,003,669	\$ 2,251,531
Finance	4111	Finance	\$ 1,711,400	Weighted Expense	47.1%	52.9%	\$ 805,856	\$ 905,544
Finance	4121	Procurement	\$ 3,191,600	Weighted Expense	47.1%	52.9%	\$ 1,502,846	\$ 1,688,754
Finance	4131	Treasury	\$ 2,598,400	Weighted Expense	47.1%	52.9%	\$ 1,223,522	\$ 1,374,878
Finance	4151	Budget	\$ 376,400	Weighted Expense	47.1%	52.9%	\$ 177,237	\$ 199,163
Finance	4161	Billing & Collect	\$ 4,169,400	FY 2020 Accounts	29.2%	70.8%	\$ 1,218,255	\$ 2,951,145
Finance	4170	Internal Aud	\$ 595,400	Weighted Expense	47.1%	52.9%	\$ 280,359	\$ 315,041
Customer Svc	5111	Customer Service	\$ 4,985,900	FY 2020 Accounts	29.2%	70.8%	\$ 1,456,827	\$ 3,529,073
Operations	2223	Storm Drainage	\$ 3,624,500	Storm Drainage / Permitting CC	23.5%	76.5%	\$ 853,344	\$ 2,771,156
			\$ 96,478,000			\$ 43,331,639	\$ 53,146,361	
Non-Operating Expenses								
Non-Operating	7111	Water Pension Expense	\$ 21,015,700	Water Only	100.0%	0.0%	\$ 21,015,700	\$ -
Non-Operating	7111	Sewer Pension Expense	\$ 28,367,500	Sewer Only	0.0%	100.0%	\$ -	\$ 28,367,500
Non-Operating	7111	Water Retail Assistance Program	\$ 2,107,200	FY 2023 Revenue Requirement	29.2%	70.8%	\$ 614,460	\$ 1,492,740
Non-Operating	7111	IWC Charges	\$ 1,616,300	Sewer Only	0.0%	100.0%	\$ -	\$ 1,616,300
			\$ 53,106,700			\$ 21,630,160	\$ 31,476,540	
GLWA Expenses								
Non-Operating	487111	GLWA Water Charge	\$ 22,985,900	Water Only	100.0%	0.0%	\$ 22,985,900	\$ -
Water - Pre-Bifurcation Debt	Debt	Water Pre-Bifurcation Debt	\$ 33,438,800	Water Only	100.0%	0.0%	\$ 33,438,800	\$ -
Non-Operating	497111	GLWA Sewer Charge	\$ 191,042,200	Sewer Only	0.0%	100.0%	\$ -	\$ 191,042,200
Sewer - Pre-Bifurcation Debt	Debt	Sewer Pre-Bifurcation Debt	\$ 26,271,500	Sewer Only	0.0%	100.0%	\$ -	\$ 26,271,500
			\$ 273,738,400			\$ 56,424,700	\$ 217,313,700	
Revenue Financed Capital								
Transfer to I&E from Revenue Fund	Capital		\$ 7,781,600	FY 23-26 M&R	84.6%	15.4%	\$ 6,580,230	\$ 1,201,370
			\$ 7,781,600			\$ 6,580,230	\$ 1,201,370	
			\$ 431,104,700			\$ 127,966,729	\$ 303,137,971	
Weighted direct allocation							47.1%	52.9%

Schedule 4a: Sewer Cost Allocation to Wastewater & Drainage

Apprn. Description	Center	Cost Center Description	FY 2023 Sewer Expense for COSA	Allocation Factor	Allocations	\$	\$
					Wastewater Drainage	Wastewater	Drainage
<b>Operating Expenses</b>							
Administration	1001	Chief Exec Officer	\$ 901,576	Weighted Expense	65.4%	34.6%	\$ 589,938 \$ 311,638
Administration	1601	BOWC	\$ 189,321	Weighted Expense	65.4%	34.6%	\$ 123,880 \$ 65,441
Operations	2401	Deputy Director Administration	\$ 1,708,226	Wet Weather Percent of Flow	69.1%	30.9%	\$ 1,180,176 \$ 528,051
Operations	2411	Field Engineering	\$ 2,950,363	Wet Weather Percent of Flow	69.1%	30.9%	\$ 2,038,340 \$ 912,022
Operations	2421	Facility Oper	\$ 4,451,526	Weighted Expense	65.4%	34.6%	\$ 2,912,814 \$ 1,538,711
Operations	2422	Fleet Operations	\$ 2,366,951	Wet Weather Percent of Flow	69.1%	30.9%	\$ 1,635,274 \$ 731,677
Operations	2431	Maint & Repair	\$ 8,058,072	Wet Weather Percent of Flow	69.1%	30.9%	\$ 5,567,143 \$ 2,490,929
Operations	2432	Meter Operations	\$ 3,007,027	Wastewater Only	100.0%	0.0%	\$ 3,007,027 \$ -
Compliance	3101	General Counsel	\$ 1,052,852	Weighted Expense	65.4%	34.6%	\$ 688,924 \$ 363,928
Compliance	3201	Org Development	\$ 830,884	Weighted Expense	65.4%	34.6%	\$ 543,682 \$ 287,203
Compliance	3301	Info Technology	\$ 8,612,347	Information Technology	53.2%	46.8%	\$ 4,578,492 \$ 4,033,855
Compliance	3411	Compliance-Security	\$ 2,045,490	Weighted Expense	65.4%	34.6%	\$ 1,338,447 \$ 707,043
Compliance	3421	Compliance-Public Affairs	\$ 985,442	Weighted Expense	65.4%	34.6%	\$ 644,815 \$ 340,627
Finance	4001	Chief Financial Officer	\$ 2,251,531	Weighted Expense	65.4%	34.6%	\$ 1,473,268 \$ 778,263
Finance	4111	Finance	\$ 905,544	Weighted Expense	65.4%	34.6%	\$ 592,534 \$ 313,010
Finance	4121	Procurement	\$ 1,688,754	Weighted Expense	65.4%	34.6%	\$ 1,105,021 \$ 583,734
Finance	4131	Treasury	\$ 1,374,878	Weighted Expense	65.4%	34.6%	\$ 899,638 \$ 475,239
Finance	4151	Budget	\$ 199,163	Weighted Expense	65.4%	34.6%	\$ 130,320 \$ 68,842
Finance	4161	Billing & Collect	\$ 2,951,145	FY 2020 Accounts	40.9%	59.1%	\$ 1,206,719 \$ 1,744,427
Finance	4170	Internal Aud	\$ 315,041	Weighted Expense	65.4%	34.6%	\$ 206,144 \$ 108,897
Customer Svc	5111	Customer Service	\$ 3,529,073	FY 2020 Accounts	40.9%	59.1%	\$ 1,443,032 \$ 2,086,040
Operations	2223	Storm Drainage	\$ 2,771,156	Storm Drainage / Permitting CC	32.7%	67.3%	\$ 906,640 \$ 1,864,516
			\$ 53,146,361			\$ 32,812,269	\$ 20,334,093
<b>Non-Operating Expenses</b>							
Non-Operating	7111	Sewer Pension Expense	\$ 28,367,500	Weighted Expense	65.4%	34.6%	\$ 18,562,009 \$ 9,805,491
Non-Operating	7111	Water Retail Assistance Program	\$ 1,492,740	FY 2023 Revenue Requirement	44.3%	55.7%	\$ 661,123 \$ 831,618
Non-Operating	7111	IWC Charges	\$ 1,616,300	Wastewater Only	100.0%	0.0%	\$ 1,616,300 \$ -
			\$ 31,476,540			\$ 20,839,432	\$ 10,637,109
<b>GLWA Expenses</b>							
Non-Operating	497111	GLWA Sewer Charge	\$ 191,042,200	Weighted GLWA Expense	43.7%	56.3%	\$ 83,526,519 \$ 107,515,681
Sewer - Pre-Bifurcation Debt	Debt	Sewer Pre-Bifurcation Debt	\$ 26,271,500	Peak Flow Ratios	15.0%	85.0%	\$ 3,940,725 \$ 22,330,775
			\$ 217,313,700			\$ 87,467,244	\$ 129,846,456
<b>Revenue Financed Capital</b>							
Transfer to I&E from Revenue Fund			\$ 1,201,370	Weighted Expense	65.4%	34.6%	\$ 786,105 \$ 415,265
			\$ 1,201,370			\$ 786,105	\$ 415,265
			\$ 303,137,971			\$ 141,905,050	\$ 161,232,922
<i>Weighted direct allocation</i>						65.4%	34.6%

Schedule 4b: Sewer Revenue Cost Allocation to Wastewater & Drainage

Apprn. Description	Cost Center	Object Description	FY 2023 Sewer Revenue for COSA	Allocation Factor	Allocations		\$	\$
					Wastewater	Drainage	Wastewater	Drainage
SDWSD-R Operating Revenue	497211	City of Detroit IWC Charges	\$ 1,616,300	Wastewater Only	100.0%	0.0%	\$ 1,616,300	\$ -
SDWSD-R Operating Revenue	497211	Shared Services Revenue	\$ 1,750,000	Weighted Expense	65.4%	34.6%	\$ 1,145,096	\$ 604,904
SDWSD-R Operating Revenue	497211	Late Payment Fee	\$ 7,538,700	Weighted Expense	65.4%	34.6%	\$ 4,932,878	\$ 2,605,822
SDWSD-R Operating Revenue	497211	472150-Other Miscellaneous	\$ 22,520,700	Weighted Expense	65.4%	34.6%	\$ 14,736,210	\$ 7,784,490
SDWSD-R Operating Revenue	497211	Miscellaneous Receipts	\$ 100,000	Weighted Expense	65.4%	34.6%	\$ 65,434	\$ 34,566
			<b>\$ 33,525,700</b>				<b>\$ 22,495,918</b>	<b>\$ 11,029,782</b>

Schedule 5: Wastewater Cost Allocation to Functions

Apprn. Description	Cost Center	Cost Center Description	FY 2023 Wastewater Expense for COSA	Allocation Factor	Allocations				\$	\$	\$	\$
					Treatment	Collection	Meters & Service Lines	Customer				
Operating Expenses												
Administration	1001	Chief Exec Officer	\$ 589,938	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 414,211	\$ 93,413	\$ 82,314
Administration	1601	BOWC	\$ 123,880	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 86,980	\$ 19,616	\$ 17,285
Operations	2401	Deputy Director Administration	\$ 1,180,176	Collection Only	0.0%	100.0%	0.0%	0.0%	\$ -	\$ 1,180,176	\$ -	\$ -
Operations	2411	Field Engineering	\$ 2,038,340	Collection Only	0.0%	100.0%	0.0%	0.0%	\$ -	\$ 2,038,340	\$ -	\$ -
Operations	2421	Facility Oper	\$ 2,912,814	Collection Only	0.0%	100.0%	0.0%	0.0%	\$ -	\$ 2,912,814	\$ -	\$ -
Operations	2422	Fleet Operations	\$ 1,635,274	Collection Only	0.0%	100.0%	0.0%	0.0%	\$ -	\$ 1,635,274	\$ -	\$ -
Operations	2431	Maint & Repair	\$ 5,567,143	Collection Only	0.0%	100.0%	0.0%	0.0%	\$ -	\$ 5,567,143	\$ -	\$ -
Operations	2432	Meter Operations	\$ 3,007,027	Meters & Service Lines Only	0.0%	0.0%	100.0%	0.0%	\$ -	\$ -	\$ 3,007,027	\$ -
Compliance	3101	General Counsel	\$ 688,924	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 483,712	\$ 109,087	\$ 96,126
Compliance	3201	Org Development	\$ 543,682	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 381,733	\$ 86,088	\$ 75,860
Compliance	3301	Info Technology	\$ 4,578,492	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 3,214,680	\$ 724,975	\$ 638,838
Compliance	3411	Compliance-Security	\$ 1,338,447	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 939,759	\$ 211,934	\$ 186,754
Compliance	3421	Compliance-Public Affairs	\$ 644,815	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 452,741	\$ 102,102	\$ 89,971
Finance	4001	Chief Financial Officer	\$ 1,473,268	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 1,034,421	\$ 233,283	\$ 205,565
Finance	4111	Finance	\$ 592,534	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 416,034	\$ 93,824	\$ 82,676
Finance	4121	Procurement	\$ 1,105,021	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 775,864	\$ 174,973	\$ 154,184
Finance	4131	Treasury	\$ 899,638	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 631,660	\$ 142,452	\$ 125,527
Finance	4151	Budget	\$ 130,320	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 91,501	\$ 20,635	\$ 18,184
Finance	4161	Billing & Collect	\$ 1,206,719	Customer Only	0.0%	0.0%	0.0%	100.0%	\$ -	\$ -	\$ -	\$ 1,206,719
Finance	4170	Internal Aud	\$ 206,144	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 144,739	\$ 32,642	\$ 28,763
Customer Svc	5111	Customer Service	\$ 1,443,032	Customer Only	0.0%	0.0%	0.0%	100.0%	\$ -	\$ -	\$ -	\$ 1,443,032
Operations	2223	Storm Drainage	\$ 906,640	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 636,576	\$ 143,561	\$ 126,504
			\$ 32,812,269					\$ -	\$ -	\$ 23,038,357	\$ 5,195,610	\$ 4,578,301
Non-Operating Expenses												
Non-Operating	7111	Sewer Pension Expense	\$ 18,562,009	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 13,032,875	\$ 2,939,174	\$ 2,589,960
Non-Operating	7111	Water Retail Assistance Program	\$ 661,123	Weighted Internal	0.0%	70.2%	15.8%	14.0%	\$ -	\$ 464,192	\$ 104,685	\$ 92,247
SDWSD-R Non Operating	7111	SDWSD-R Non-Operating Exp	\$ 1,616,300	Treatment Only	100.0%	0.0%	0.0%	0.0%	\$ 1,616,300	\$ -	\$ -	\$ -
			\$ 20,839,432					\$ 1,616,300	\$ 13,497,067	\$ 3,043,858	\$ 2,682,207	
GLWA Expenses												
Non-Operating	497111	GLWA Sewer Charge	\$ 83,526,519	Treatment Only	100.0%	0.0%	0.0%	0.0%	\$ 83,526,519	\$ -	\$ -	\$ -
Sewer - Pre-Bifurcation Debt	Debt	Sewer Pre-Bifurcation Debt	\$ 3,940,725	Collection Only	0.0%	100.0%	0.0%	0.0%	\$ -	\$ 3,940,725	\$ -	\$ -
			\$ 87,467,244					\$ 83,526,519	\$ 3,940,725	\$ -	\$ -	
Revenue Financed Capital												
Transfer to I&E from Revenue Fund			\$ 786,105	Collection Only	0.0%	100.0%	0.0%	0.0%	\$ -	\$ 786,105	\$ -	\$ -
			\$ 786,105					\$ -	\$ -	\$ 786,105	\$ -	\$ -
			\$ 141,905,050					\$ 85,142,819	\$ 41,262,254	\$ 8,239,469	\$ 7,260,507	
Weighted internal allocation								0.0%	70.2%	15.8%	14.0%	

Schedule 6: Water Cost Allocation to Functions

Apprn. Description	Cost Center	Cost Center Description	FY 2023 Water Expense for COSA	Allocation Factor	Allocations	Treatment	Distribution	Meters & Service Lines	Customer	Fire Protection	\$	\$	\$	\$	\$
<b>Operating Expenses</b>															
Administration	1001	Chief Exec Officer	\$ 802,324	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 610,981	\$ 105,882	\$ 85,461	\$ -
Administration	1601	BOWC	\$ 168,479	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 128,299	\$ 22,234	\$ 17,946	\$ -
Operations	2401	Deputy Director Administration	\$ 1,916,474	Distribution Only	0.0%	100.0%	0.0%	0.0%	0.0%		\$ -	\$ 1,916,474	\$ -	\$ -	\$ -
Operations	2411	Field Engineering	\$ 3,310,037	Distribution Only	0.0%	100.0%	0.0%	0.0%	0.0%		\$ -	\$ 3,310,037	\$ -	\$ -	\$ -
Operations	2421	Facility Oper	\$ 3,961,474	Distribution Only	0.0%	100.0%	0.0%	0.0%	0.0%		\$ -	\$ 3,961,474	\$ -	\$ -	\$ -
Operations	2422	Fleet Operations	\$ 2,418,049	Distribution Only	0.0%	100.0%	0.0%	0.0%	0.0%		\$ -	\$ 2,418,049	\$ -	\$ -	\$ -
Operations	2431	Maint & Repair	\$ 8,232,028	Maintenance & Repair	0.0%	91.3%	0.0%	0.0%	8.7%		\$ -	\$ 7,518,671	\$ -	\$ -	\$ 713,357
Operations	2432	Meter Operations	\$ 3,035,773	Meters & Service Lines Only	0.0%	0.0%	100.0%	0.0%	0.0%		\$ -	\$ -	\$ 3,035,773	\$ -	\$ -
Operations	2435	Lead Service	\$ 278,500	Meters & Service Lines Only	0.0%	0.0%	100.0%	0.0%	0.0%		\$ -	\$ -	\$ 278,500	\$ -	\$ -
Compliance	3101	General Counsel	\$ 936,948	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 713,499	\$ 123,648	\$ 99,801	\$ -
Compliance	3201	Org Development	\$ 739,416	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 563,075	\$ 97,580	\$ 78,761	\$ -
Compliance	3301	Info Technology	\$ 5,312,953	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 4,045,887	\$ 701,144	\$ 565,921	\$ -
Compliance	3411	Compliance-Security	\$ 1,820,310	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 1,386,191	\$ 240,224	\$ 193,895	\$ -
Compliance	3421	Compliance-Public Affairs	\$ 876,958	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 667,816	\$ 115,731	\$ 93,411	\$ -
Finance	4001	Chief Financial Officer	\$ 2,003,669	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 1,525,821	\$ 264,422	\$ 213,425	\$ -
Finance	4111	Finance	\$ 805,856	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 613,671	\$ 106,348	\$ 85,839	\$ -
Finance	4121	Procurement	\$ 1,502,846	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 1,144,438	\$ 198,329	\$ 160,079	\$ -
Finance	4131	Treasury	\$ 1,223,522	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 931,729	\$ 161,467	\$ 130,326	\$ -
Finance	4151	Budget	\$ 177,237	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 134,969	\$ 23,390	\$ 18,879	\$ -
Finance	4161	Billing & Collect	\$ 1,218,255	Customer Only	0.0%	0.0%	0.0%	100.0%	0.0%		\$ -	\$ -	\$ -	\$ 1,218,255	\$ -
Finance	4170	Internal Aud	\$ 280,359	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 213,497	\$ 36,999	\$ 29,863	\$ -
Customer Svc	5111	Customer Service	\$ 1,456,827	Customer Only	0.0%	0.0%	0.0%	100.0%	0.0%		\$ -	\$ -	\$ -	\$ 1,456,827	\$ -
Operations	2223	Storm Drainage	\$ 853,344	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 649,833	\$ 112,615	\$ 90,896	\$ -
			\$ 43,331,639								\$ -	\$ 32,454,412	\$ 5,624,285	\$ 4,539,585	\$ 713,357
<b>Non-Operating Expenses</b>															
Non-Operating	7111	Water Pension Expense	\$ 21,015,700	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 16,003,747	\$ 2,773,417	\$ 2,238,536	\$ -
Non-Operating	7111	Water Retail Assistance Program	\$ 614,460	Weighted Internal	0.0%	76.2%	13.2%	10.7%	0.0%		\$ -	\$ 467,919	\$ 81,090	\$ 65,451	\$ -
			\$ 21,630,160								\$ -	\$ 16,471,666	\$ 2,854,507	\$ 2,303,986	\$ -
<b>GLWA Expenses</b>															
Non-Operating	487111	GLWA Water Charge	\$ 22,985,900	Treatment Only	100.0%	0.0%	0.0%	0.0%	0.0%		\$ 22,985,900	\$ -	\$ -	\$ -	\$ -
Water - Pre-Bifurcation Debt	Debt	Water Pre-Bifurcation Debt	\$ 33,438,800	Distribution Only	0.0%	100.0%	0.0%	0.0%	0.0%		\$ -	\$ 33,438,800	\$ -	\$ -	\$ -
			\$ 56,424,700								\$ 22,985,900	\$ 33,438,800	\$ -	\$ -	\$ -
<b>Revenue Financed Capital</b>															
Transfer to I&E from Revenue Fund			\$ 6,580,230	Distribution Only	0.0%	100.0%	0.0%	0.0%	0.0%		\$ -	\$ 6,580,230	\$ -	\$ -	\$ -
			\$ 6,580,230								\$ -	\$ 6,580,230	\$ -	\$ -	\$ -
			\$ 127,966,729								\$ 22,985,900	\$ 88,945,108	\$ 8,478,792	\$ 6,843,571	\$ 713,357
<i>Weighted internal allocation</i>											0.0%	76.2%	13.2%	10.7%	2.8%

Schedule 7: Water Cost Allocation to Cost Components

	Base Average Day	Extra Max Day	Extra Peak Hour	Meters & Service Lines	Customer	Fire Protection	Total
Treatment	69%	31%					\$22,985,900
Distribution	50%	23%	27%				\$88,945,108
Meters & Service Lines				100%			\$8,478,792
Customer					100%		\$6,843,571
Fire Protection						100%	\$713,357
<b>Total</b>	<b>\$60,438,125</b>	<b>\$27,372,918</b>	<b>\$24,119,965</b>	<b>\$8,478,792</b>	<b>\$6,843,571</b>	<b>\$713,357</b>	

	Average Units	Max Day Units	Peak Hour Units
Model Units (FY 2023)	7,089.8	9,506.7	11,245.9
DWSD Coincident Peaking Ratios <sup>1</sup>	1.00	1.34	1.59
Calculated DWSD Fire Flow Requirements	-	794.1	2,887.7
Total with Fire Flow Requirements <sup>2</sup>	7,089.8	10,300.9	14,133.6
Calculated DWSD Peaking Ratios	<b>1.00</b>	<b>1.45</b>	<b>1.99</b>

(1) Peaking factors based on Black & Veatch Phase 1 Report.

(2) DWSD Fire Flow Requirements calculation shown in Schedule 9.

Schedule 8: Water Allocation to Class

	Base Average Day	Extra Max Day	Extra Peak Hour	Meters & Service Lines	Customer	Direct Fire Protection
<b>Cost</b>	\$60,438,125	\$27,372,918	\$24,119,965	\$8,478,792	\$6,843,571	\$713,357

Units	Mcf/day	Mcf/day	Mcf/day	Equivalent Meters/Services	Bills	Hydrants
Retail <sup>1</sup>	7,090	2,417	1,739	243,907	2,299,762	-
Public Fire <sup>2</sup>	-	743	1,959			29,948
Private Fire <sup>2</sup>	-	51	135	15,642	21,017	-
<b>Total Units</b>	<b>7,090</b>	<b>3,211</b>	<b>3,833</b>	<b>259,548</b>	<b>2,320,779</b>	<b>29,948</b>

<b>Cost per Unit</b>	\$23.36	\$8,524.63	\$6,293.18	\$32.67	\$2.95	\$23.82
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Allocation to Class							Total Class Cost
Retail	\$60,438,125	\$20,603,357	\$10,944,675	\$7,967,815	\$6,781,596	\$0	<b>\$106,735,568</b>
Public Fire	\$0	\$6,334,399	\$12,328,353	\$0	\$0	\$713,357	<b>\$19,376,109</b>
Private Fire	\$0	\$435,162	\$846,937	\$510,977	\$61,975	\$0	<b>\$1,855,051</b>

(1) Retail average day, max day, and peak hour units shown in Schedule 7. Retail equivalent meters and bills based FY 2021 actual billing data adjusted for FY 2022 & FY 2023 growth.

(2) Public and Private Fire max day and peak hour units calculation shown in Schedule 9. Bills and hydrants shown in Schedule 10.

Schedule 9: DWSD Fire Flow Requirements

<b>Fire Type</b>	<b>FY 2017-21 Max Fires/Day<sup>1</sup></b>	<b>FY 2017-21 Max Fire/Hour<sup>2</sup></b>	<b>Duration (min)</b>	<b>Gallons/Minute (gpm)</b>	<b>Peak Day Demand (MGD)</b>	<b>Peak Hour Demand (MGD)</b>
Single Family <sup>3</sup>	27	8	120	1,500	4.9	17.3
Non-Single Family <sup>4</sup>	2	1	180	3,000	1.1	4.3
Total Fire (MGD)					5.9	21.6
Total Fire (Mcf)					794.1	2,887.7
Extra Capacity						2,093.6

(1) Maximum fires/day based on average of 2017-2021 maximum fire incidents in a single day for structure fires.

(2) Maximum fires/hour based on average of 2017-2021 maximum fire incidents in a single hour on maximum day for structure fires.

(3) Per ISO Guidelines (Chapter 7) needed fire flow is 1,500 gpm and duration for 2 hours when distance between residential dwellings is 0-10 feet. Detroit ordinance minimum setbacks are 4 feet on a side / 14 ft combined total.

(4) Needed Fire Flow Duration for commercial properties based on ISO Fire Suppression Rating Schedule.

## Duration of Fires

Customer Type	> 2:00	> 1:00	< 1:00
Residential	795	4,144	6,845
Non-Single Family	182	698	1,420

## Count of Fires

Customer Type	2017	2018	2019	2020	2021	5-Yr Average
Residential Max Day	40	26	23	27	20	27
Non-Single Family Max Day	7	9	8	7	6	7
Coincident Max Day	43	27	25	30	20	29
Max Day	7/5/2017	5/29/2018	7/5/2019	7/5/2020	10/31/2020	
Residential on Max Day	40	26	23	27	20	27
Non-Single Family Max Day	3	1	2	3	0	2
Coincident Peak Fires on Max Day	12	5	9	9	6	
Residential at Peak Hour	11	5	8	8	6	8
Non-Single Family at Peak Hour	1	0	1	1	0	1

Schedule 10: Equivalent Fire Units

<b>Fire Type</b>	<b>6" Equivalency for Capacity<sup>1</sup></b>	<b>5/8" Equivalency for Meters &amp; Services<sup>2</sup></b>	<b>Private Fire Connections<sup>3</sup></b>	<b>Public Fire<sup>4</sup></b>
4" Fireline	0.34	5.81	629	
6" Fireline	1.00	9.18	622	
8" Fireline	2.13	11.77	439	
10" Fireline	3.83	16.33	41	
12" Fireline	6.19	21.72	20	
Hydrants	1.00			29,948
<b>Total Bills</b>			<b>21,017</b>	<b>N/A</b>
<b>Total Equivalent Capacity Units</b>			<b>2,057</b>	<b>29,948</b>
<b>Total 5/8" Equivalents for Meters &amp; Services</b>			<b>15,642</b>	<b>N/A</b>

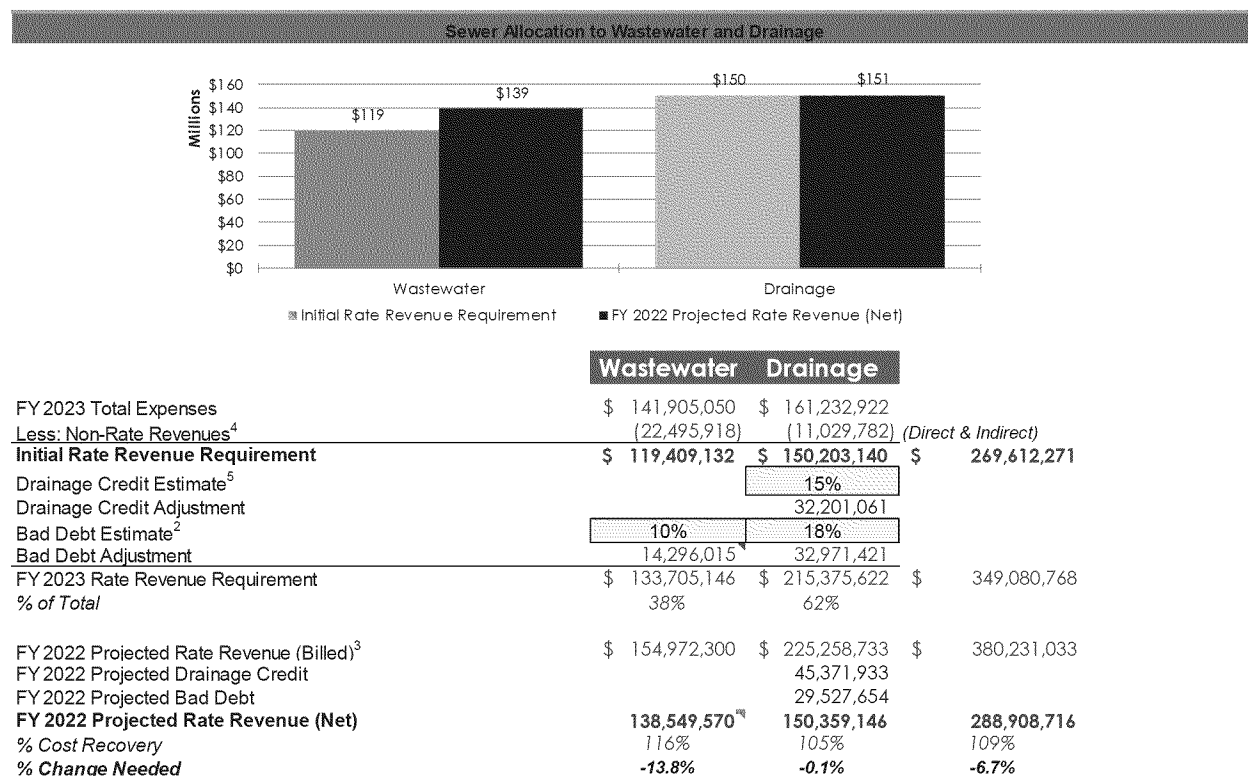
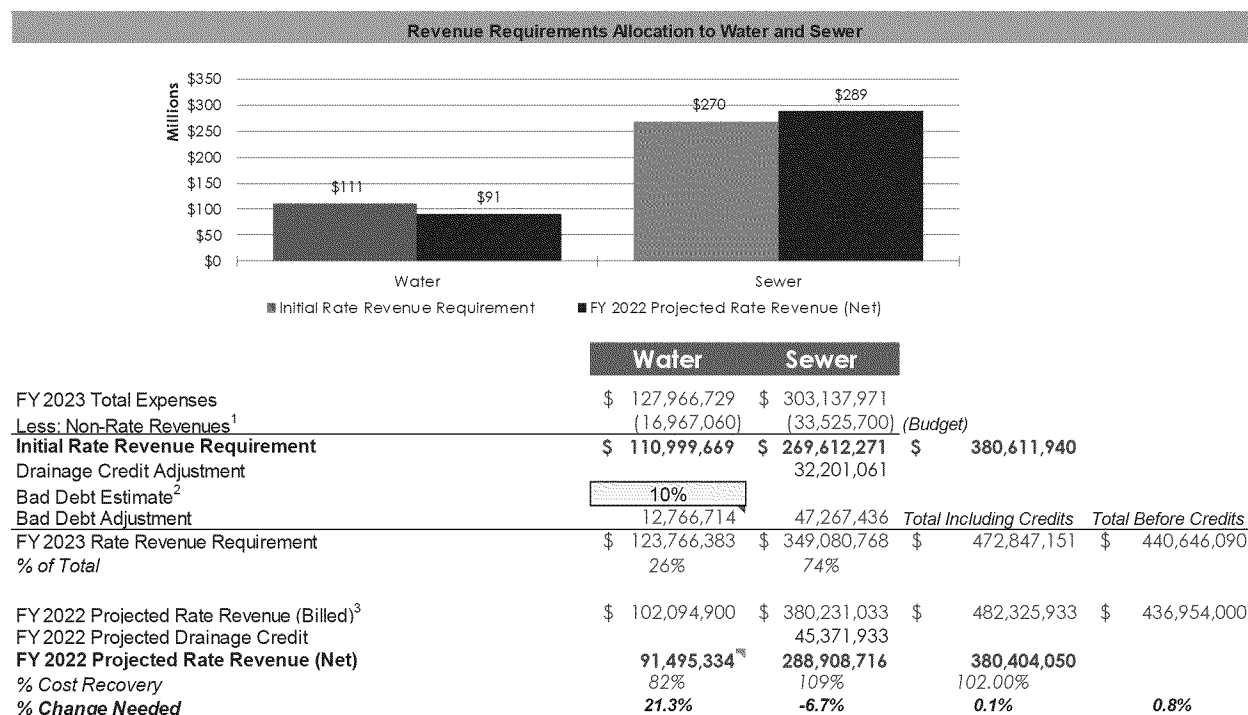
(1) Assumes hydrants are on 6" line and uses Hazen Williams formula to calculate flow capacity.

(2) Based on line costs per DWSD staff by size and cost of 5/8" meter used for flow detection.

(3) Private fire meters based on FY 2021 actual billing data adjusted for FY 2022 & FY 2023 growth.

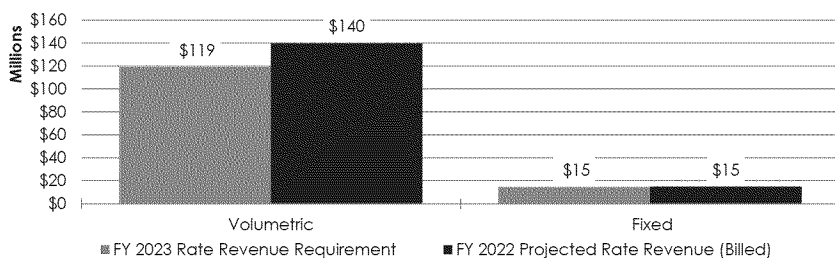
(4) Current total fire hydrants as of April 11, 2022 based on data per Detroit Fire Department.

Schedule 11: Cost Allocation Analysis Summary



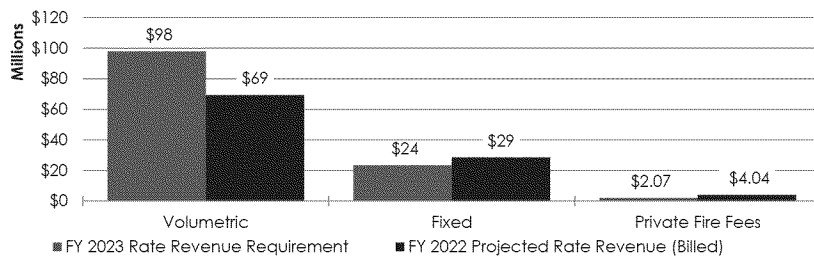
Schedule 11: Cost Allocation Analysis Summary

Wastewater Allocation to Rate Components



	Volumetric	Fixed	
FY 2023 Total Expenses	\$ 126,405,074	\$ 15,499,976	
Less: Non-Rate Revenues <sup>5</sup>	(20,038,739)	(2,457,180)	(Indirect)
Initial Rate Revenue Requirement	\$ 106,366,335	\$ 13,042,796	\$ 119,409,132
Bad Debt Adjustment <sup>6</sup>	12,734,492	1,561,522	
<b>FY 2023 Rate Revenue Requirement</b>	<b>\$ 119,100,828</b>	<b>\$ 14,604,319</b>	<b>\$ 133,705,146</b>
<b>FY 2022 Projected Rate Revenue (Billed)<sup>3</sup></b>	<b>\$ 139,941,000</b>	<b>\$ 15,031,300</b>	<b>\$ 154,972,300</b>
FY 2022 Projected Rate Revenue (Net)	125,111,167	13,438,403	138,549,570
% Cost Recovery	117%	103%	116%

Water Allocation to Rate Components



	Volumetric	Fixed	Private Fire Fees	
FY 2023 Total Expenses	\$101,674,212	\$24,437,465	\$1,855,051	
Less: Non-Rate Revenues <sup>7</sup>	(13,679,244)	(3,287,816)	0	(Indirect Retail)
Initial Rate Revenue Requirement	\$ 87,994,968	\$ 21,149,650	\$ 1,855,051	\$ 110,999,669
Bad Debt Adjustment <sup>8</sup>	10,120,810	2,432,544	213,360	
<b>FY 2023 Rate Revenue Requirement</b>	<b>\$ 98,115,778</b>	<b>\$ 23,582,193</b>	<b>\$ 2,068,412</b>	<b>\$ 123,766,383</b>
<b>FY 2022 Projected Rate Revenue (Billed)<sup>3</sup></b>	<b>\$ 69,433,800</b>	<b>\$ 28,619,200</b>	<b>\$ 4,041,900</b>	<b>\$ 102,094,900</b>
FY 2022 Projected Rate Revenue (Net)	62,225,133	25,647,934	3,622,267	91,495,334
% Cost Recovery	71%	121%	195%	82%

- (1) Non-Rate Revenues allocated to Water/Sewer based on FY 2023 Budget.
- (2) Bad Debt Estimate as a percentage of retail revenues based on DWSD calculation.
- (3) FY 2022 Projected Rate Revenue based on Revenue Sufficiency Analysis.
- (4) Non-Rate Revenues allocated to Wastewater/Drainage based on Schedule 4b.
- (5) Wastewater Non-Rate Revenues indirectly allocated to Volumetric/Fixed based on FY 2023 Total Expenses.
- (6) Wastewater bad debt indirectly allocated to Volumetric/Fixed based on Initial Rate Revenue Requirement.
- (7) Water Non-Rate Revenues indirectly allocated to Volumetric/Fixed based on FY 2023 Total Expenses.
- (8) Water bad debt indirectly allocated to Volumetric/Fixed/Private Fire Fees based on Initial Rate Revenue Requirement.

	GLWA System				Detroit Plus			
	Sanitary (MGD)	DWII (MGD)	WWI (MGD)	Wet Weather %	Sanitary (MGD)	DWII (MGD)	WWI (MGD)	Wet Weather %
FY2017	185.32	296.11	207.66	30.1%	51.18	214.69	133.41	33.4%
FY2018	194.47	243.52	220.70	33.5%	58.48	170.11	151.62	39.9%
FY2019	191.30	273.71	232.20	33.3%	57.08	186.22	154.51	38.8%
FY2020	180.75	269.35	182.29	28.8%	52.26	179.65	117.23	33.6%
FY2021	184.59	217.44	162.54	28.8%	52.28	156.02	114.79	35.5%
	5-Year Avg			30.9%				

Source: CDM Smith, Flow Balance Analysis & Results for Fiscal Year 2020 (2017-2020), Flow Balance Analysis & Results for Fiscal Year 2021 (2021), Attachment 3 & Attachment 4.

Wholesale Revenue Req't	FY 2022		FY 2023		Capital	O&M	Capital	O&M	FY17-21 Avg Wet Weather Flow	
	Costs <sup>1</sup>	Relative %	Costs <sup>2</sup>	Allocation <sup>3</sup>	Allocation <sup>3</sup>	Drainage % <sup>4</sup>	Drainage % <sup>5</sup>	Allocation	Drainage Cost	
Treatment	99,348,800	52.7%	100,602,099					30.9%	31,098,339	
Collection / Conveyance	39,383,000	20.9%	39,879,822	56.5%	43.5%	85.0%	30.9%	61.5%	24,517,545	
CSO Facilities	49,930,600	26.5%	50,560,481					100.0%	50,560,481	
<b>Total Revenue Req't</b>	<b>188,662,400</b>		<b>191,042,403</b>						<b>106,176,365</b>	<b>56.3%</b>

(1) FY 2022 Costs by category based on GLWA FY 2022 Calc Sheets.

(2) FY 2023 Costs based on GLWA FY 2023 Calc Sheets (total), allocated to categories based on FY 2022 Relative %.

(3) Capital Allocation based on GLWA report of costs by type.

(4) Capital allocated to drainage based on hydraulic capacity.

(5) O&M costs allocated to drainage based on calculation in Schedule 12.

Schedule 13: Maintenance Hours Allocation

Code		Description	Annual labor hours to complete work		Water	Sewer
INVBBA		CLEAN CATCH BASIN	15000			100%
BR		REPAIR CATCH BASINS	16000			100%
INVC		INVESTIGATE CAVE IN	800	Weighted		
GVR		REPAIR GATE VALVE	600		100%	
HGV		HYDRANT GATE VALVE	400		100%	
HMAJ		HYDRANT DIG UP/NOT OPERABLE	120		100%	
HMAJ		HYDRANT MAJOR/SCREW IN	4000		100%	
HMIN		HYDRANT MINOR OR FROZEN	4500		100%	
INVLP		LOW PRESSURE	1000		100%	
INVCBC		MISSING BASIN COVER	300			100%
INVMHC		MISSING MANHOLE COVER	250	Weighted		
MHR		MANHOLE REPAIR (MOSTLY CONTRACTED OUT)	135	Weighted		
INVREST		RESTORATION	166	Weighted		
REST		RESTORATION	4676	Weighted		
DEMO		DEMO DISCONNECT	3200		100%	
WSK		SERVICE KILL	4800		100%	
INVSL		SERVICE LEAK	1500		100%	
SL		SERVICE LEAK	11200		100%	
SL		SERVICE LEAK - TURN OFF VACANT MR	4600		100%	
SNL		STOP BOX DIG UP-LOCATE OR RECONDITION	9600		100%	
SNL		SERVICE REQUEST 1554 RECONDITION- T-OFF	800		100%	
INVSO		SEWER ODOR	400			100%
SR		SEWER REPAIR				
INVWIB		WATER IN BASEMENT	9000			100%
INVWMB		INVESTIGATE WATER MAIN BREAK	5250		100%	
WMB		REPAIR WATER MAIN BREAK (40% IN HOUSE)	14400		100%	
INVWQ		WATER QUALITY	563		100%	
WATER SERVICE		REPLACE LEAD SERVICE	1280		100%	
MISS DIG		MISS DIG LOCATES	63750	Weighted		
EMER SEWER			6480			100%
CCTV Sewer Mains	PM Activities		9600			100%
Clean Sewer Mains	PM Activities		9600			100%
<b>Total allocated hours</b>					<b>67,813</b>	<b>66,380</b>
<i>Allocation</i>					<i>50.5%</i>	<i>49.5%</i>

## Schedule 14: Capital Improvement Plan Allocation

## DWS Water 5 Year CIP (\$1,000)

Description		Status	Source of Funds	2021-22	2022-23	2023-24	2024-25	2025-26	2022-2026 CIP Total	FY 2023-FY 2026 Revenue Funded
WS-703	Water Main Replacement (33,820 LF)	C	I&E	-	-	-	-	-	-	
WS-704	Water Main Replacement -along Outerdrive	C	Bond	-	-	-	-	-	-	
WS-705	Water Main Replacement-2-sections	C	Bond	-	-	-	-	-	-	
WS-706	Water Main Replacement Wayne Co. Roads	C	Bond	-	-	-	-	-	-	
WS-707	Water Main Replacement- (20,000LF)	C	Loan (DWRf)	-	-	-	-	-	-	
WS-710	Water Main Replacement-Incl Wayne Co Roads	A	Loan (DWRf)	200	-	-	-	-	200	
WS-711	Water Main Replacement- Incl Jefferson Streetscape	A	Loan (DWRf)	4,200	1,814	-	-	-	6,014	
WS-712	Water Main Replacement-Cornerstone Village	A	I&E/Bond	7,630	3,690	-	-	-	11,320	
WS-713	Water Main Replacement-Jefferson/Chalmers	N	DWRf	7,500	7,250	-	-	-	14,750	
WS-714	Water Main Replacement-MDOT Streetscape	C	DWRf	-	-	-	-	-	-	
WS-715	Pilot Areas-Riverdale, Minock, Miller & Rosedale	N	DWRf/I&E	6,900	7,000	2,100	-	-	16,000	
WS-718	WM New Center Commons & Virginia Park	P	DWRf/I&E	2,300	-	-	-	-	2,300	
DWS-907	Watermain & Sewer Rehab- North Rosedale Park	A	I&E/Bond	5,000	-	-	-	-	5,000	
WS-720	Watermain Replacement-Various Streets	N	I&E/Bond	3,100	6,000	3,000	-	-	12,100	
WS-721	Lead Service Line Replacement	N	I&E/Bond	6,000	5,000	-	-	-	11,000	
WS-723	Lead Service Line Replacement for Settlements	N	Grant/Legal Settlements	800	200	-	-	-	1,000	
WS-725	Watermain Replacement-Medical Ctr, Cultural Ctr & Midtown 30,000LF	N	DWRf/Bond	-	4,000	5,000	5,000	-	14,000	
WS-702	Repair & Replacement of Water Mains	A	I&E	-	-	-	-	-	-	
WS-708	Repair of Water Mains	A	I&E	-	-	-	-	-	-	
WS-717	Repair & Replacement of Water Mains (WS-702B)	N	I&E	3,500	2,500	3,000	3,000	3,000	15,000	8,500
WS-719	Repair of Water Mains (WS-708/WS-702A) incl r	N	I&E	5,000	3,500	2,000	2,000	2,000	14,500	7,500
DWS-902	Repair of Pavement (break repair)	A	I&E	1,920	-	-	-	-	1,920	
DWS-904	Repair of Lawns (break repair)	A	I&E	1,500	-	-	-	-	1,500	
DWS-919	(replace DWS-902)	N	I&E	5,100	5,100	5,100	2,720	2,720	20,740	12,920
PC-808	West Warren (Constance at Rouge Park/Tireman Sawyer PH III)	P	Bond	4,000	4,200	-	-	-	8,200	
CS-1909	A-Condition Assessments-High Priority Neighborhoods	P	I&E	250	-	-	-	-	250	
CS-1921	Watermain/Sewer Design	P	I&E	1,000	1,000	1,000	-	-	3,000	
CS-1923	Third Party Inspection (Water & Sewer)	N	I&E	750	750	750	-	-	2,250	
CS-1947	Condition Assessment Sherwood Forest,	N	I&E	250	250	-	-	-	500	
CS-1812	Professional Engineering and Construction Services for CIPMO	A	I&E/Bond	2,795	-	-	-	-	2,795	
Construction Program Management Allowances		N	I&E	-	-	1,000	750	750	2,500	
Watermain Program Allowances		N	I&E	-	-	8,000	10,000	10,000	28,000	
PC-803B	Meter Installation	A	I&E	700	700	-	-	-	1,400	
Water Meter Replacement Program		A	I&E	451	750	750	750	750	3,451	
Fire Hydrant Replacement Program		A	I&E	250	250	250	250	250	1,250	
CS-1925	Ittron Migration -MIU Replacement	A	I&E/Bond	1,800	9,900	1,750	-	-	13,450	
CS-1926	Ittron Migration Project Management	A	I&E	325	560	1,115	-	-	2,000	
Vehicle, Heavy Equipment, and Equipment Purchases		A	I&E	682	750	500	500	500	2,932	
Information Technology		A	I&E	1,965	1,618	500	500	500	5,082	
Facility Improvement Allowance		A	I&E	3,761	1,000	500	500	500	6,261	
<b>TOTALS</b>				<b>79,628</b>	<b>67,782</b>	<b>36,315</b>	<b>25,970</b>	<b>13,250</b>	<b>230,665</b>	<b>28,920</b>
Water % of Total									<b>52.9%</b>	<b>84.6%</b>

Highlighted cells reflect expenses assumed to continue in FY 2026.

Schedule 14: Capital Improvement Plan Allocation

DWSD Sewer 5 Year CIP (\$1,000)

Description	Status	Source of Funds	2021-22	2022-23	2023-24	2024-25	2025-26	2022-2026 CIP Total
DWS-903 Inspection and Rehabilitation of Sewers City Wide	A	I&E/ Bond	7,000	-	-	-	-	7,000
DWS-907 North Rosedale Park	A	Bond	3,000	-	-	-	-	3,000
DWS-908 Cornerstone Village Sewer Rehab	A	Bond	2,693	-	-	-	-	2,693
DWS-909 Sewer Condition assessments throughout City	C	I&E	-	-	-	-	-	-
DWS-910- Sewer Condition Assessments High Priority	C	I&E	-	-	-	-	-	-
DWS-916 Sewer Improvements in High Priority Neighborhoods	A	SRF	2,600	-	-	-	-	2,600
DWS-917 Sewer Improvement in Riverdale	N	SRF	5,000	4,800	300	-	-	10,100
DWS-918 Sewer Improvements in Rosedale	N	SRF	4,450	450	-	-	-	4,900
DWS-920 Inspection and Rehabilitation of Sewers City Wide(Replace DWS-903)	N	I&E	3,000	8,000	4,000	-	-	15,000
DWS-921 Electrical Monitoring Upgrades at Belle Isle,Woodmere, Fischer Sewage	P	I&E	200	200	200	-	-	600
DWS-926 Sewer Condition Assessments - West Village,Southwest Detroit, Michigan	P	I&E	-	2,500	2,500	-	-	5,000
DWS-931 Roofing Upgrades at Sewage PumpStations	P	I&E	325	325	275	-	-	925
DWS-932 Large Sewer Improvements: Riverdale & Rosedale	P	I&E/Bond	4,400	400	-	-	-	4,800
DWS-933 Corktown Sewer	C	I&E	-	-	-	-	-	-
DWS-937 Sewer Replacement	N	SRF/I&E	8,000	7,600	-	-	-	15,600
DWS-938 Sewer Condition assessments throughout City (DWS-909)	N	SRF/I&E	2,250	2,250	-	-	-	4,500
DWS-939 Sewer Condition Assessments High Priority	N	SRF/I&E	2,250	2,250	-	-	-	4,500
Sewer Program Allowances	N	I&E	-	2,000	12,000	14,000	14,000	42,000
CS-1812 Professional Engineering and Construction Services forCapital Improveme	A	I&E	2,795	-	-	-	-	2,795
DWS-902 Repair of Pavement (break repair)	A	I&E	75	-	-	-	-	75
DWS-904 Repair of Lawns (break repair)	A	I&E	338	-	-	-	-	338
DWS-919 (replace DWS-902)	N	I&E	900	900	900	480	-	3,180
Repair and Maintenance Allowance	N	I&E	-	-	1,000	1,000	1,000	3,000
CS-1921 Watermain/Sewer Design	N	I&E	1,000	1,000	1,000	-	-	3,000
CS-1923 Third Party Inspection (Water & Sewer)	N	I&E	750	750	750	-	-	2,250
CS-1522 Green Infrastructure Program Management	C	I&E	-	-	-	-	-	-
PC-799 Crowell Rec Center and EcoSite Modifications	C	I&E	3	-	-	-	-	3
PC-808 West Warren (Constance at Rouge Park/Tireman Sawyer PH III)	N	I&E/Grant	10,040	7,650	6,280	3,995	995	28,960
PC-808 Sewer Rehabilitation (Non GSI)	N	I&E	1,500	1,500	-	-	-	3,000
PC-801A Oakman Blvd	A	I&E/ Bond	60	60	60	-	-	180
PC-800 O'Shea Park	C	I&E	10	-	-	-	-	10
PC-806 Charles H. Wright Academy	N	I&E	1,485	45	38	-	-	1,568
North Rosedale (Edinborough)	N	I&E	-	-	-	-	-	-
Capital Partnership Program	P	I&E	100	-	-	-	-	100
Chandler Park Drive (CIPMP)	N	I&E	150	-	-	-	-	150
Green Stormwater Infrastructure Construction Allowance	N	I&E	-	-	-	5,000	5,000	10,000
CS-1884 Green Infrastructure Program Management	P	I&E	2,500	2,500	2,500	1,000	1,000	9,500
Vehicle, Heavy Equipment, and Equipment Purchases	N	I&E	682	750	500	500	500	2,932
Information Technology	N	I&E	1,965	1,618	500	500	500	5,082
Facility Improvement Allowance	N	I&E	3,761	1,000	500	500	500	6,261
<b>TOTALS</b>			<b>73,280</b>	<b>48,548</b>	<b>33,303</b>	<b>26,975</b>	<b>23,495</b>	<b>205,601</b>

FY 2023-FY 2026  
Revenue Funded

2,280  
3,000

5,280

Sewer % of Total

47.1%

15.4%

Schedule 15: Meter & Service Line Costs / Capacity Data

Meter & Line Cost Price List Effective July 1, 2021 per DWSD

Size	Type	Max Flow Rate	Meter Cost	Labor Cost	ARM/MXU - 200W (Time)	Van	Pipe	Adapter	Tee	Companion Flange	Restraint Rod	Total Cost w/ Meter	Total Cost w/ 5/8" Meter	Retail Meter Equivalency - Cost w/ Meter <sup>1</sup>	Fire Line Equivalency - Cost w/ 5/8" Meter <sup>2</sup>	Capacity Equivalency - Flow Ratios
5/8"	Positive Displacement	20	\$59.39	\$17.00	\$78.00	\$12.91						\$167.30	\$167.30	1.00	1.00	1.00
3/4"	Positive Displacement	30	\$74.00	\$17.00	\$78.00	\$12.91						\$181.91	\$167.30	1.09	1.00	1.50
1"	Positive Displacement	50	\$104.00	\$17.00	\$78.00	\$12.91						\$211.91	\$167.30	1.27	1.00	2.50
1 1/2"	Displacement / Single Jet Electronic	100	\$411.00	\$36.36	\$78.00	\$12.91						\$538.27	\$186.66	3.22	1.12	5.00
2"	Displacement / Single Jet Electronic	160	\$512.00	\$54.54	\$104.00	\$19.37						\$689.91	\$237.30	4.12	1.42	8.00
3"	Magnetic Flow	510	\$1,647.90	\$222.88	\$104.00	\$51.64	\$238.10	\$98.17	\$101.32	\$32.21	\$0.00	\$2,496.22	\$907.71	14.92	5.43	25.50
4"	Magnetic Flow	920	\$1,943.00	\$222.88	\$104.00	\$51.64	\$221.19	\$125.61	\$135.27	\$52.47	\$0.00	\$2,856.06	\$972.45	17.07	5.81	46.00
6"	Magnetic Flow	2,800	\$2,886.00	\$581.76	\$104.00	\$103.28	\$244.88	\$184.44	\$191.62	\$65.75	\$0.00	\$4,361.73	\$1,535.12	26.07	9.18	140.00
8"	Magnetic Flow	3,700	\$4,307.00	\$581.76	\$104.00	\$206.56	\$344.25	\$291.49	\$289.43	\$91.82	\$0.00	\$6,216.31	\$1,968.70	37.16	11.77	185.00
10"	Magnetic Flow	7,045	\$8,465.00	\$891.52	\$104.00	\$206.56	\$468.79	\$413.40	\$485.32	\$103.44	\$0.00	\$11,138.03	\$2,732.42	66.58	16.33	352.25
12"	Magnetic Flow	11,008												98.00	21.72	550.40
14"	Magnetic Flow	17,613												144.27	28.89	880.65
16"	Magnetic Flow	22,897												212.37	38.43	1,144.85

(1) Equivalency for meters 10" and smaller based on actual installation and meter costs; equivalency for meters 12" and larger based on average cost increase between 3" - 10" meter sizes.

(2) Equivalency for meters 10" and smaller based on actual installation costs with 5/8" meter cost; equivalency for meters 12" and larger based on average cost increase between 3" - 10" meter sizes.

## APPENDIX D: RATE DESIGN SUPPORTING SCHEDULES

Schedule 1: Water Rate Design

Water Fixed Charges						
	Customer	Meters & Service Lines	Public Fire Protection	% Incl. in Meter Charge	Current Revenue	Revenue Requirement
			50%			
FY 2023 Revenue Requirement	\$ 6,544,251	\$ 7,688,955	\$ 9,348,988		\$ 28,619,200	\$ 23,582,193
FY 2023 Equivalent Units	191,647	243,907	367,978			
Charge per Equivalent per Month	\$ 2.85	\$ 2.63	\$ 2.12			

Meter Equivalency			
5/8"	1.00	1.00	1.00
3/4"	1.00	1.09	1.50
1"	1.00	1.27	2.50
1 1/2"	1.00	3.22	5.00
2"	1.00	4.12	8.00
3"	1.00	14.92	25.50
4"	1.00	17.07	46.00
6"	1.00	26.07	140.00
8"	1.00	37.16	185.00
10"	1.00	66.58	352.25
12"	1.00	98.00	550.40
14"	1.00	144.27	880.65
16"	1.00	212.37	1,144.85

	Current Meter Charge	Proposed Meter Charge
5/8"	\$ 7.86	\$ 7.59
3/4"	\$ 11.79	\$ 8.88
1"	\$ 19.65	\$ 11.47
1 1/2"	\$ 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

FY 2021 Meters			
5/8"	137,605	137,605	137,605
3/4"	33,579	33,579	33,579
1"	11,024	11,024	11,024
1 1/2"	2,865	2,865	2,865
2"	2,720	2,720	2,720
3"	672	672	672
4"	539	539	539
6"	269	269	269
8"	85	85	85
10"	38	38	38
12"	4	4	4
14"	0	0	0
16"	1	1	1

Schedule 1: Water Rate Design

Volume Rates				
	Volume Rates		Current Revenue	Revenue Requirement
FY 2023 Revenue Requirement	\$ 98,115,778	(Includes remaining public fire protection costs)	\$ 69,433,800	\$ 98,115,778
FY 2023 Usage (Mcf)	2,558,080			
			Current Volume in Tier	Proposed Volume in Tier
Tier 1 Max (Mcf)	0.60		Tier 1	All Volume
Tier 2 Max (Mcf)	N/A		Tier 2	N/A
FY 2021 Volume			Current Volume Rate	Proposed Volume Rate
Tier 1 Volume (Mcf)	854,602		Tier 1 (0-0.6 Mcf)	\$ 26.60
Tier 2 Volume (Mcf)	1,733,183		Tier 2 (>0.6 Mcf)	N/A
Tier 1 Rate (per Mcf)	\$ 25.04			
Tier 2 Rate (per Mcf)	\$ 44.92			
Private Fireline Charges				
	Private Fire		Current Revenue	Revenue Requirement
Revenue Requirement	\$ 2,068,412		\$ 4,041,900	\$ 2,068,412
Equivalent Units	2,057			
Charge per Equivalent per Month	\$ 83.78			
			Current Charge	Proposed Charge
Connection Size Equivalency	(Hazen Williams)		4"	\$ 94.41
4"	0.34		6"	\$ 196.69
6"	1.00		8"	\$ 283.23
8"	2.13		10"	\$ 456.32
10"	3.83		12"	\$ 676.61
12"	6.19			
FY 2021 Connections by Size				
4"	614			
6"	607			
8"	428			
10"	40			
12"	20			

# EXHIBIT B



City of Ann Arbor, MI

# Water and Sewer Cost of Service Study Final Report

June 27, 2018





June 26, 2018

Ms. Lynne Chaimowitz  
Budget and Finance Supervisor  
City of Ann Arbor  
301 E. Huron Street  
Ann Arbor, Michigan 48104

Re: Water and Sewer Cost of  
Service Study – Final Report

Dear Ms. Chaimowitz,

Stantec Financial Services is pleased to present this Final Report for the Water and Sewer Cost of Service Study (Study) that we performed for City of Ann Arbor, Michigan (City). We appreciate the fine assistance provided by you and all of the members of the City staff and community stakeholders who participated in the Study.

If you or others at the City have any questions, please do not hesitate to call me at (813) 204-3331 or email me at [andrew.burnham@stantec.com](mailto:andrew.burnham@stantec.com). We appreciate the opportunity to be of service to the City, and look forward to the possibility of doing so again in the near future

Sincerely,

A handwritten signature in dark ink, appearing to read "Andrew J. Burnham".

Andrew J. Burnham  
Vice President

777 S. Harbour Island Blvd., Suite 600  
Tampa, Florida 33602  
(813) 204-3331  
[andrew.burnham@stantec.com](mailto:andrew.burnham@stantec.com)

Enclosure

## 5. RATE CALCULATION

The Study included an examination of the City's current water and sewer rates and development of recommended rate structure modifications that i) fairly and equitably recover the City's identified cost to serve each respective rate class, ii) conform to accepted local and national industry practices, iii) ensure fiscal stability and reasonable recovery of fixed costs, and iv) minimize administrative burden and enhance the ability to be easily understood by stakeholders.

The Utility's existing rate structure is comprised of quarterly fixed charges by meter size and volumetric charges per CCF (commonly referred to as a "Unit" for billing purposes) that vary by rate classification. The existing volumetric water rates for Residential customers is a three-tier inclining block rate structure, while all other water rate classes have a unique uniform volumetric rate applied to all consumption. The Utility's sewer rates include the same quarterly fixed charges as water service, and a uniform volumetric rate applicable to all rate class for all billed sewer volume. Additionally, it is important to note that the Utility applies a 10% discount for prompt payment by the due date. *As such, all current and proposed bill calculations included in this section of the report include the 10% discount unless otherwise noted.*

The following page includes a summary of the current rates and charges of the Utility for each rate classification or customer class.

## Current FY 2018 Water and Sewer Fixed Quarterly Charges by Meter Size:

Meter Size	Current
5/8	\$ 11.25
3/4	\$ 16.55
1	\$ 30.30
1.5	\$ 62.00
2	\$ 97.00
3	\$ 95.00
4	\$ 308.00
6	\$ 613.00
8	\$ 1,225.00
10	\$ 1,960.00

## FY 2018 Water Volumetric Rates (\$/CCF or Unit, Showing Quarterly Consumption in Each Tier):

- Residential<sup>1</sup>
  - Tier 1: up to 7 CCF, \$1.55
  - Tier 2: over 7 to 28 CCF, \$3.37
  - Tier 3: over 28 CCF, \$5.89
- Commercial<sup>2</sup>
  - Peaking 1, \$3.81
  - Peaking 2, \$7.26
  - Peaking 3, \$12.44
- Water Only
  - All Use \$5.89

## FY 2018 Sewer Volumetric Rate (\$/CCF, Note: Residential Volume Based on Winter Quarter Average):

- All Customers
  - All Use, \$4.58

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<sup>1</sup> Residential customers with a separate water only meter are classified RES 2 and only have the first 2 tiers apply to their consumption.

<sup>2</sup> Peaking 1: factor less than 5, Peaking 2; factor between 5 and 8, Peaking 3; factor greater than 8

## 5.1 QUARTERLY FIXED CHARGES

Common industry practice is to develop a two-part rate structure comprised of both fixed and variable charges. Generally accepted practice recovers a portion of system costs in a fixed charge, recognizing that utilities have substantial cost that are customer-specific such as meter replacement, public fire protection, and customer service costs that are incurred year-round. Utilities incur these fixed costs regardless of water use. Failure to establish a proper level of fixed cost recovery subjects the Utility to revenue volatility in certain conditions, such as abnormal weather or economic events.

During the conduct of the Study, several observations were made relative to level of the Utility's fixed charges. As part of preparing comparative rate surveys, it was noted that the City has some of the lowest fixed charges of the entities surveyed. Moreover, the current fixed charges only represent about 12% of the Utility's annual revenue, whereas rating agency guidance and observed industry practices target 30% of annual revenue from fixed service charges. Lastly, the Utility's current charges are the same for water and sewer services, whereas many utilities will establish separate fixed charges that are unique to the cost requirements of each respective system or service.

It is recommended that the Utility update its fixed charges to reflect the current cost for meter replacement, public fire protection, and administrative activities. Specifically, the fixed charge should recover administrative costs (such as customer service, billing and collection, meter reading, etc.) equally per meter, meter replacement costs based on the specific cost and useful life of each meter size, and public fire protection costs based upon meter size (in the water charge only). It is important to note that meter replacement costs have been split evenly between water and sewer fixed charges, recognizing that the meter provides the basis for billing both water and sewer service charges. The proposed fees presented below reflect the unique cost of service by meter size for each system, conform to industry practices, and are anticipated to comprise a slightly greater percentage of the Utility's annual revenue.

**Table 5-1 Proposed Water and Sewer Quarterly Fixed Charges**

<b>WATER SERVICE</b>		<b>SEWER SERVICE</b>	
5/8 " meter	\$20.89	5/8" meter	\$13.09
3/4" meter	22.43	3/4" meter	13.47
1" meter	25.26	1" meter	13.98
1½" meter	33.09	1½" meter	16.01
2" meter	41.90	2" meter	17.84
3" meter	88.47	3" meter	45.86
4" meter	115.48	4" meter	51.98
6" meter	176.75	6" meter	55.22
8" meter	257.21	8" meter	66.07
10" meter	343.11	10" meter	70.74

## 5.2 VOLUMETRIC CHARGES

As indicated, adjustments to the City's current inclining block rate structure (in number, size, and pricing of each block or tier) are recommended to conform to the current cost to serve, reflect current usage profiles, strengthen legal defensibility, and improve conformance to accepted industry practices.

Table 5-2 provides a summary of the residential water usage profile used to establish the recommended water use within each tier of the inclining block rate structure presented herein. The summary table illustrates the development of the initial tier at 9 CCF per quarter, which is sufficient to provide an allowance for typical indoor domestic use of 36.7 gallons per capita per day (per the Residential End Uses of Water, Version 2, published in April of 2016 by the Water Research Foundation), and an assumed 2.0 persons per household. Incorporating readily available industry data relative to residential per person indoor water use into the tier setting process enhances the ability of the tier structure to reflect current usage profiles. The next tier spans from 9 to 18 CCF per quarter, providing an additional allowance for the indoor domestic use of larger families (which may in some cases also represent modest amounts of outdoor use by smaller families).

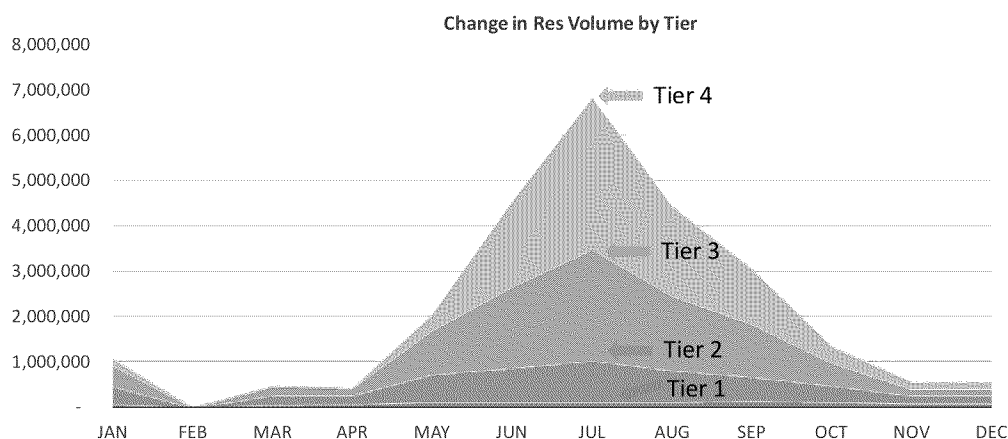
The next tier (18 to 36 CCF quarterly) would accommodate reasonable amounts of discretionary irrigation for typical properties, based on a GIS analysis of typical residential lot sizes, irrigable area, and water requirements for normal landscape in the City. The existing top tier would then be revised to include all usage over 36 CCF quarterly. Based upon FY 2016 billing data, less than 10% of all residential bills issued have usage over 36 CCF per quarter.

Table 5-2 Residential Water Usage Profile

Tier 1	Value	Block Max	Current
People per Household	2.00		
Typical Indoor Use (Gallons per Capita per Day)	36.7		
Typical Essential Domestic Use (CCF/month)	2.98		
<b>First Tier Usage Amount (CCF)</b>	<b>9</b>	<b>9</b>	<b>7</b>
Tier 2	Value	Block Max	Current
People per Household	4.00		
Typical Indoor Use (Gallons per Capita per Day)	36.7		
Typical Essential Domestic Use (CCF/month)	5.97		
<b>Second Tier Usage Amount (CCF)</b>	<b>18</b>	<b>18</b>	<b>28</b>
Tier 3			
<b>Typical parcel (sq. ft.)</b>	10,890		
Square inches of area in 1/4 acre	2,090,880	(calculated)	
% of area that is irrigable	25%		
Reference ET (inches)	32.0		
Average annual rainfall	36.0	10%	
Crop Coefficient	75%		
Irrigation Efficiency	70%		
Water Budget (CF per month)	5.753	(calculation)	
<b>Third Tier Usage Amount (CCF)</b>	<b>18</b>	<b>36</b>	<b>&gt;28</b>
<b>Fourth Tier Usage Amount (CCF)</b>	<b>All Use</b>	<b>&gt;36</b>	

Once reasonable tiers were constructed using the most relevant and recent data, the rate structure analysis used the COS results to calculate the unit cost/rate for each tier. Connecting the cost of service to the volumes and seasonal demand patterns present within each tier creates a strong, proportional, and transparent relationship between the use of water and the cost of service. The following graphic displays the relative contribution of peak demands from the Residential class for each proposed tier.

Graphic 5-3 Residential Water Usage by Tier in Cubic Feet (CF)



It is very evident from the preceding graphic that the volumes in each tier are quite different in their contributions to peak demands, and generally reflect the usage profile employed to size each tier.

The pricing for each tier reflected the allocated proportion of the average day, maximum day, and peak hour costs for the demands in each respective tier as shown in Table 5-4 below. Max day and peak hour volumes shown are the proportional change in volume from February (system min) to July (system peak).

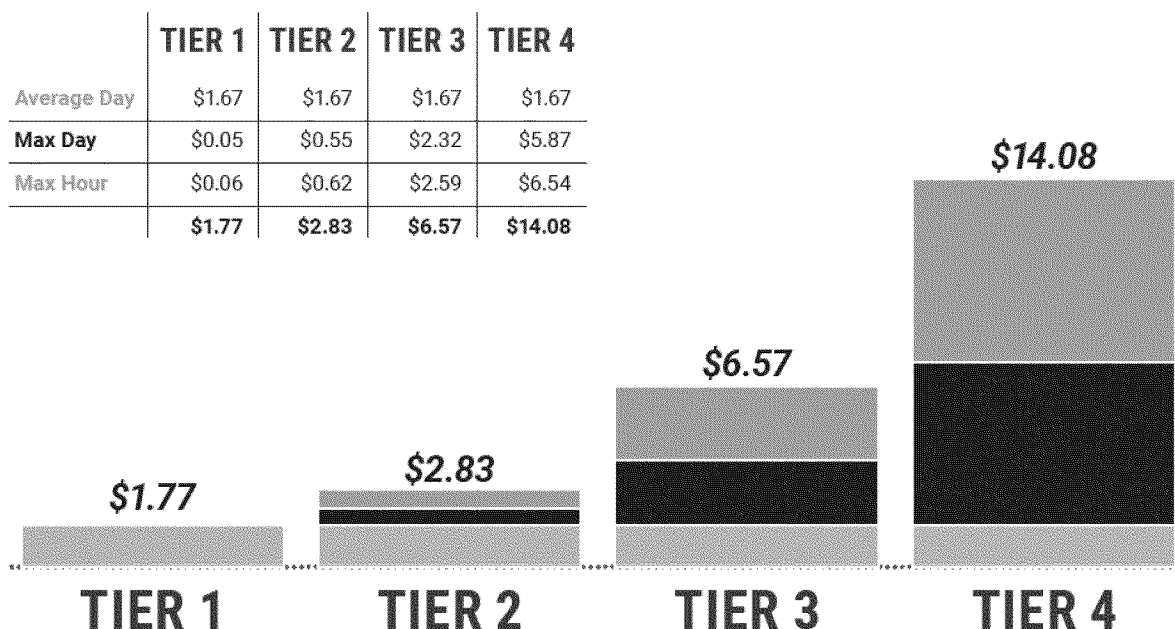
**Table 5-4 Residential Units of Service & Cost Allocations by Tier**

Units of Service by Tier CCF	Average Day	Max Day	Peak Hour
<b>Tier 1</b>	674,229	126,100	126,100
<b>Tier 2</b>	438,039	902,300	902,300
<b>Tier 3</b>	285,236	2,464,900	2,464,900
<b>Tier 4</b>	152,238	3,328,400	3,328,400

System Cost by Tier	Average Day	Max Day	Peak Hour
<b>Tier 1</b>	\$1,010,380	\$30,473	\$33,963
<b>Tier 2</b>	\$656,432	\$218,045	\$243,021
<b>Tier 3</b>	\$427,447	\$595,653	\$663,883
<b>Tier 4</b>	\$228,140	\$804,322	\$896,453

As can be seen from the summary graphic on the following page, tiers 3 and 4 have a larger allocation of system costs associated with serving maximum day and peak hour demands due to their significantly great contribution to the peak demands placed on the Utility.

Graphic 5-5 Residential Water Pricing per CCF



For all other rate classes, a uniform volumetric rate based on the cost to serve each respective class was determined to be the most appropriate rate structure, similar to what is effectively in place today. The Utility presently has a sub-classification system for Non-Residential customers based on peaking factors, whereby approximately 98% of users fall in the first classification, effectively rendering the current system a uniform rate structure (which is the most common industry practice for Non-Residential customers).

While the Non-Residential, Multifamily, and Water Only rate classes do place seasonal demands on the system, the cost of serving those respective demands will be paid via a charge per CCF or Unit of water used. As a class, it is well established and supported by data (as is the case here) that Residential customers use water differently than Non-Residential, Multifamily, and Water Only customers. However, for customers within a class, such as different types of Non-Residential customers, there needs to be a rationale, data, and system for developing and administering a structure that is fair and based on the cost to serve. Within the Non-Residential class, there is a wide variety of business types with different levels of water usage requirements and metering configurations, such that charging a tiered volumetric rate for this customer class as a whole would not be fair.

For example, a small office in the City may use about 20 CCF throughout the year, and a restaurant with the same square footage may use 100 CCF throughout the year. If a second tier rate were set at 50 CCF, that would be unfair to the restaurant to charge them more for 50 CCFs, even though they are not contributing to the cost that is driving the Non-Residential peak to the system. Because Non-Residential customers have no standard activity to determine a fair way to allocate the cost of service in the pricing structure, a flat rate is the most equitable in the absence of the data, system, and resources to establish and maintain individualized customer-specific tiers. Should the City desire to evaluate non-residential tiers in the future, data relative to property size, business type, irrigable area, and peak demands (daily and

hourly) should be collected and maintained for each customer. The same rationale holds true for the Multifamily class, because there are Multifamily customers that have 5 units on one meter, and others that have 50 units. Recognizing customer-specific data requirements and system limitations, a uniform rate is the most equitable method to have these classes (and Water Only) as a whole pay for the cost of service.

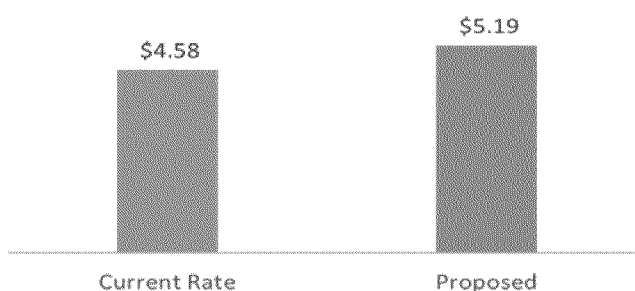
**Table 5-6 Water Pricing Per CCF for Other Rate Classes**



*Rates shown before 10% on time payment discount, Current Non-Residential rate shown is Peak factor 1*

The Utility currently has a uniform volumetric rate for sewer service applicable to all rate classes based on measured water consumption in each billing cycle, with the exception that winter average water use serves as the basis of billing in summer months for the Residential class. Doing so ensures that Residential seasonal water demands likely associated with outdoor irrigation are not charged sewer. No adjustments are recommended to the Utility's current sewer volumetric rate structure as the structure conforms to accepted industry practice. As such, this analysis only updated the volumetric rate per CCF or Unit to reflect the results of the COS analysis, including the distribution of revenue requirements between fixed and volumetric charges. The resulting rate is proposed at 5.19 per CCF used per quarter.

**Table 5-7 Sewer Pricing per CCF for All Rate Classes**



*Rates shown before 10% on time payment discount*

### 5.3 CUSTOMER IMPACTS

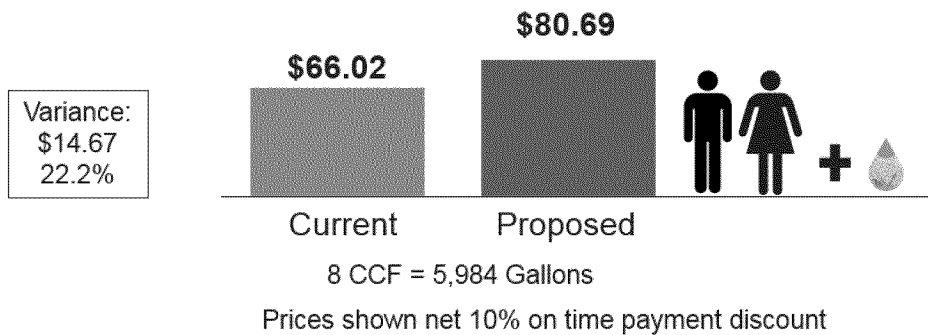
When considering any rate changes, an understanding of how the proposed changes will impact different customers at various levels of water use is essential to understand and communicate. As such, several customer impact analyses were prepared as part of the Study to identify the impact of the proposed rates. The following graphics present a comparison of the current water and sewer bill as compared to the bill under the proposed rates for various customer types and water usage levels.

Graphic 5-8 Residential Quarterly Water & Sewer Bill Impact Scenario 1

5/8" meter with water and sewer service

Two person household with minimal outdoor water use

8 CCF per quarter

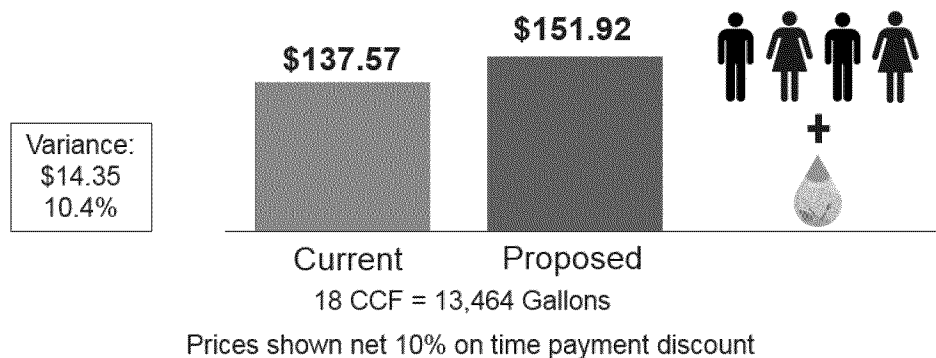


Graphic 5-9 Residential Quarterly Water & Sewer Bill Impact Scenario 2

5/8" meter with water and sewer service

Four person household with minimal outdoor use

18 CCF per quarter

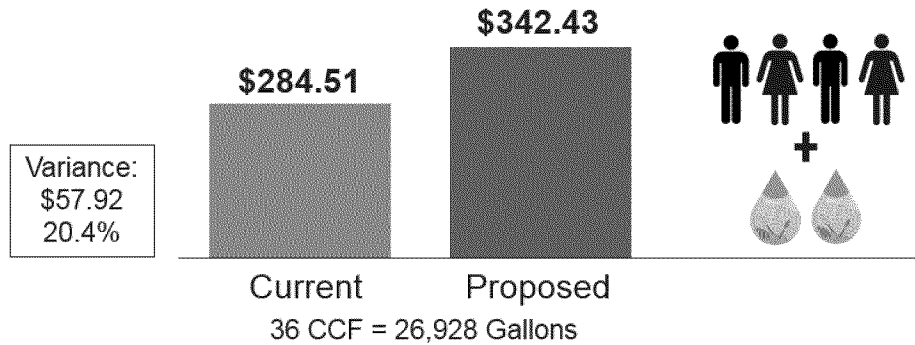


Graphic 5-10 Residential Quarterly Water &amp; Sewer Bill Impact Scenario 3

5/8" meter with water and sewer service

Four person household with moderate outdoor use

36 CCF per quarter



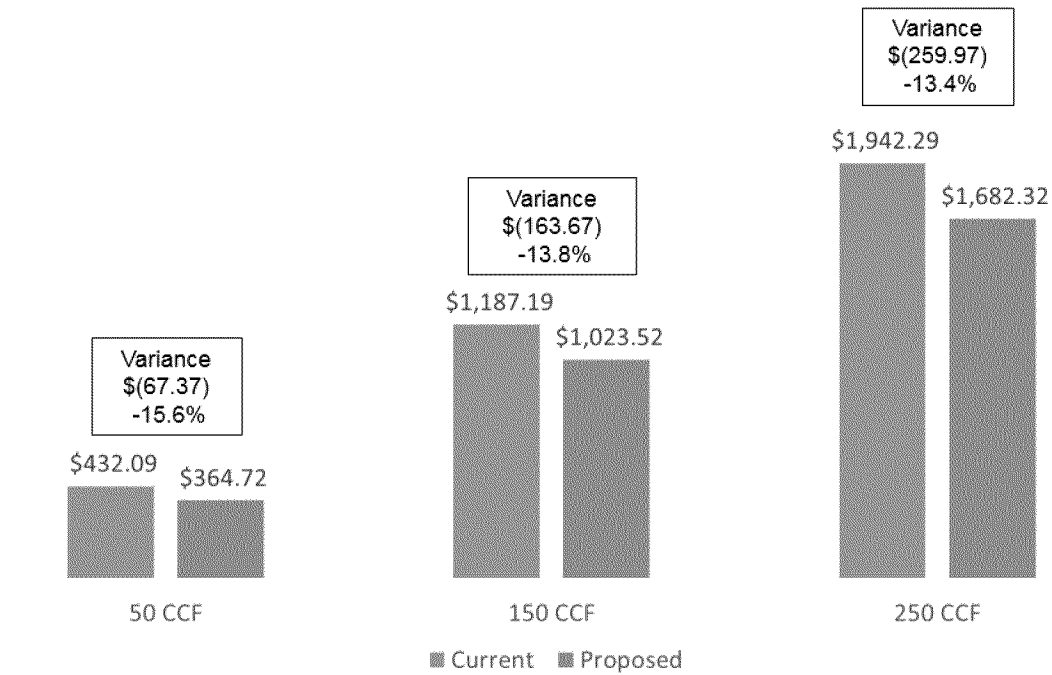
Prices shown net 10% on time payment discount

Graphic 5-11 Select Non-Residential Quarterly Bill Impacts

Type	Meter	Current	Proposed	Change \$	Change %
Grocery Store	2"	\$ 8,002	\$ 7,573	\$ (429)	-5%
Deli	1.5", 1.5"	\$ 4,747	\$ 4,434	\$ (313)	-7%
Pub	1.5"	\$ 3,883	\$ 3,667	\$ (216)	-6%
Brewery	1", 5/8"	\$ 2,660	\$ 2,550	\$ (110)	-4%
Teen Center	5/8"	\$ 166	\$ 171	\$ 5	3%
Specialty Store	5/8"	\$ 288	\$ 288	\$ -	0%
Hotel	2", 3"	\$ 24,319	\$ 23,031	\$ (1,288)	-5%
Professional Office	2"	\$ 1,613	\$ 1,436	\$ (178)	-11%
Dry Cleaners	5/8"	\$ 430	\$ 441	\$ 11	3%
Hospital	6"	\$ 29,143	\$ 27,672	\$ (1,471)	-5%

Bills shown net of 10% on time payment discount

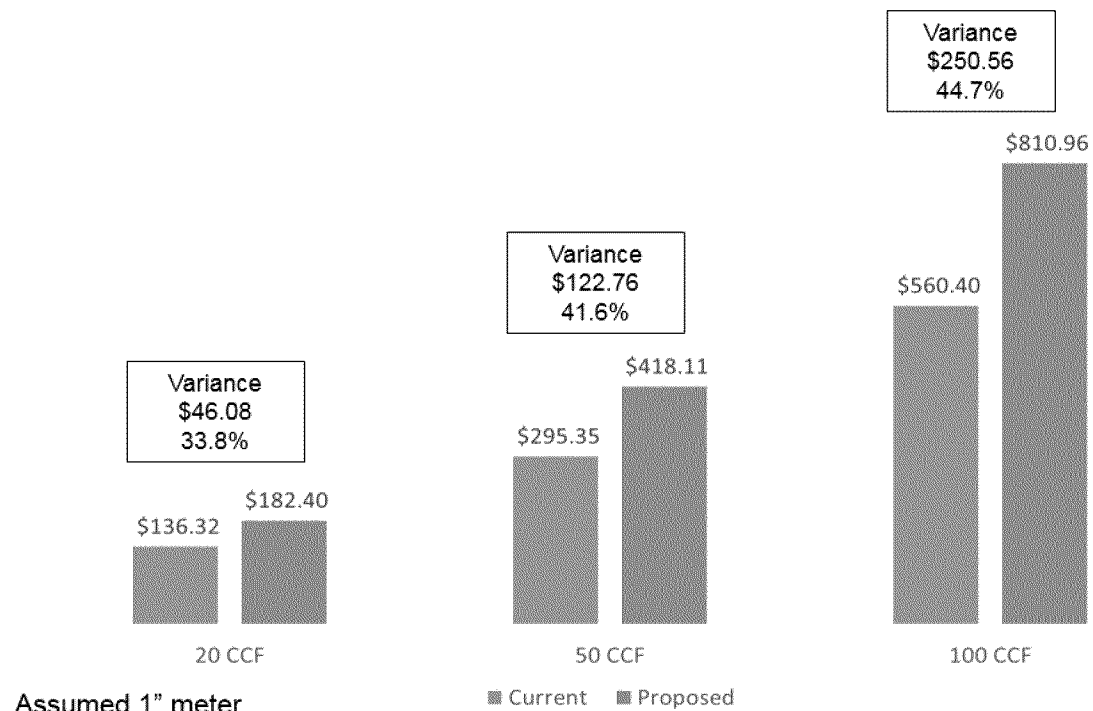
Graphic 5-12 Select Multifamily Customer Quarterly Bill Impact



Assumed 1" meter

Bill shown net 10% on time payment discount

Graphic 5-13 Select Water Only Customer Quarterly Bill Impact



Assumed 1" meter

Bill shown net 10% on time payment discount

# EXHIBIT C

February 24, 2016

Detroit City Council  
DWSD Board of Water Commissioners  
Detroit Water and Sewerage Department

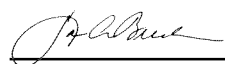
The Detroit Blue Ribbon Panel on Affordability (BRPA) is pleased to submit the attached report on its findings and recommendations to address water affordability issues. Our report reflects our consideration of information on the circumstances in Detroit, the City's ongoing initiatives to improve Detroit Water and Sewerage Department (DWSD) customer service, and options that may be implemented by DWSD to address low-income customer needs.

We have developed recommendations that recognize the acute and immediate needs of low-income customers while also acknowledging practical limitations imposed by DWSD's antiquated billing, collection and customer service systems. Our recommendations also recognize that differences of opinion prevail about the legality of the income-indexed rate component of the proposed Water Affordability Program – and do not rely on resolution of that matter. Legislation to enhance options is recommended and may also rectify legal ambiguities.

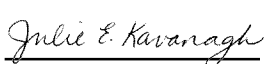
In the short term, we recommend that customer assistance be expanded, to the extent practical, through allocation of non-rate sources of funding. These programs may help address the needs of Detroit's most economically disadvantaged. We also recommend that in-progress customer service initiatives be amplified in collaboration with community stakeholders. Longer term, we recommend implementation (as soon as practicable) of carefully designed increasing block water and sewer rate structures applicable to all residential users (rather than income-indexed rates applicable to income qualified customers). Though we understand that no set of water affordability measures may solve the problems of endemic poverty in Detroit, we assert that our recommendations can mitigate some of its most searing effects.

We would like to acknowledge the participation of DWSD's leadership team who provided invaluable insight into the Detroit context and substantive initiatives already in progress. We earnestly hope that our insights, findings and recommendations prove helpful in mitigating the City's daunting water affordability challenges and promoting universal access to water service for all Detroiters.

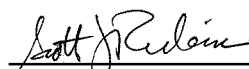
The Blue Ribbon Panel on Affordability:



Janice Beecher, Ph.D.



Julie Kavanagh



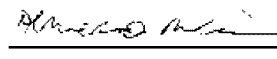
Scott Rubin



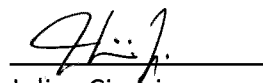
Mary Blackmon



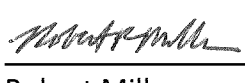
Karla Marshall



Demeeko Williams



Julius Ciaccia



Robert Miller



Roger Colton



Eric Rothstein (Chair)

## Executive Summary

One of the most acute consequences of the City of Detroit's historic decline has been the growth in the number of low-income customers encountering difficulties in paying their water and sewer bills. Over the years, these problems in one of the nation's poorest large cities have led to abysmal bill- collection rates and large numbers of service disconnections. In 2005, related concerns led to the proposal of a Water Affordability Program for the City of Detroit that featured an income-indexed rate proposal. Although that proposal was not implemented, in part because of potential challenges under Michigan law, persistent concerns about water affordability remained – and intensified in October 2014, when service disconnection protests gained international attention. Concurrent with these challenges, the southeastern Michigan region is embracing a new institutional structure for water and sewer service in the form of the Great Lakes Water Authority (effective January 1, 2016). The Authority is now responsible for providing water and sewage treatment and transmission service to wholesale customers and the City of Detroit, while the Detroit Water and Sewerage Department (DWSD) retains responsibility for delivering retail water and sewer service to its customers.

In May 2015, faced with meeting its financial obligations to the planned regional authority while also recognizing the financial struggles of Detroit residents, the Detroit City Council expressed renewed interest in investigating the feasibility of the Water Affordability Program originally proposed in 2005. In October 2015, the City of Detroit convened a Blue Ribbon Panel on Affordability (BRPA), composed of national experts and local stakeholders, to collectively identify and evaluate options to address low-income customers' challenges in paying water and sewer bills and the subsequent service disconnections. The panel met four times between October 2015 and December 2015 and made the following findings:

- No single rate design or assistance program can adequately address the diverse, multi-dimensional poverty and water affordability challenges that persist in Detroit, or elsewhere, though progress can be made through a multi-pronged, long-term affordability program. Implementing an array of options may reduce overall system costs and more equitably distribute cost responsibilities by avoiding selected billing and collection expenses and broadening the population of paying customers.
- Among the options considered, increasing-block rate designs for both water and sewer services would be an effective pricing structure for addressing water affordability issues in Detroit. By contrast, an income-indexed rate component, such as that included in the Water Affordability Program initially proposed to DWSD in 2005, would be more susceptible to legal challenge, more difficult to implement and administer, and less broadly based due to the income-qualification provision of this rate design.
- DWSD may be able to augment funding of bill payment and water conservation assistance programs for qualifying low-income customers by directing revenues from activities other

than water and sewer service sales (i.e., non-rate revenues) toward this purpose. These funding allocations require consideration of potential legal and financial implications.

- New DWSD leadership is appropriately prioritizing the improvement of its retail billing and collection systems and practices. These actions should result in improvements for all DWSD retail customers, especially those encountering payment challenges.
- Implementing alternative rate structures and selected changes to billing and collection practices that require billing software and data management changes will require approximately two years, and possibly longer.
- As acknowledged by new leadership, cultural change is needed in DWSD to emphasize responsive and compassionate retail customer service.
- Water affordability is significantly affected by the overall costs of service and the allocation of shares of cost responsibilities across system users.
- Community groups and activists have been instrumental in highlighting the plight of low-income customers in Detroit, and they should play a critical role in ongoing efforts to improve water affordability.

Centering on these and related findings, the BRPA identified a number of recommendations for short- and long-term actions that DWSD may take, as well as opportunities to advocate for state and federal policy measures to help address water affordability. These recommendations include:

- In the near term, DWSD should evaluate and, to the extent practical, expand funding of bill payment and water conservation assistance programs from non-rate funding sources. Expanded assistance program funding and outreach can help address the needs of the most economically disadvantaged customers.
- In the near term, DWSD should dedicate necessary financial and managerial resources to expedite improvement of billing, collection, and other customer services, placing a high priority on converting from address-based accounts to assigning accounts to financially responsible parties. DWSD should continue pursuing opportunities to enhance efficiency and customer service through partnerships with DTE Energy and other utility service providers.
- DWSD should carefully design and implement increasing-block rate structures for water and sewer services as soon as practical, recognizing the limitations of its existing billing system and customer service processes. The rate structures should be based on cost-of-service principles and promote end-use efficiency, while ensuring that minimum levels of service required for health and sanitary purposes are more broadly affordable. Rate structure revisions also must be designed to ensure Detroit continues to generate

not increasing fixed charges to unaffordable levels for low-income populations). Implementation involves less complex modifications to billing system routines and business processes. Because the quantity allowances are incorporated within fixed charges applicable to all customers, their benefit is universally applicable, obviating the need to establish a separate customer class or maintain eligibility data on low-income populations. By the same token, by including a specific usage allowance within DWSD's fixed charges, some customers may be disaffected because they have reduced, or could reduce, consumption below the allowance level. In these likely limited cases, these customers could be paying more for basic levels of service than under a rate that charges for all water used.

- **Increasing Block Rates.** Increasing block rates relate to volumetric rates within a water or sewer rate structure. They impose higher per-unit costs for higher levels of water use within predefined ranges (or blocks) of consumption. An affordability-structured increasing block rate will charge for minimal usage at levels that should be affordable for most low-income customers (for example, 4% to 8% of household income), and will charge for subsequent increments of usage in ways that not only encourage resource efficiency, but also allocate the recovery of costs to those who place more burdens on the system.<sup>23</sup> Implementation issues are substantial due to the relative complexity of the service pricing structure and attendant changes needed to billing system software routines, business processes and customer service protocols, particularly in the event that rates are differentiated by customer classes (residential, commercial, industrial).<sup>24</sup>
- **Property-Value-Based Fire Protection Charges.** This option would involve revising existing fixed charges, or adding separate fixed charges (with corresponding reductions in revenues from other rate components), to recover the costs of fire protection on the basis of property value protected. This could render water affordability benefits by shifting cost recovery responsibilities to those owning higher valued properties. Implementation issues would be substantial, particularly given that existing account information already must be supplemented to assign financial responsibility to property owners, and this option would further require a tie to property valuation data. In addition, existing cost-of-service

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<sup>23</sup> The BRPA acknowledged the importance of several key dimensions of an increasing block rate structure to ensure that it improves, rather than impedes, affordability for low-income customers. In particular, care is required in defining the size (usage volume) and pricing of the initial rate block, the number of blocks, and the pricing differences among the blocks. While the same rate blocks are not necessarily required for sewer service pricing, an increasing block rate structure for water service will have limited impact on water affordability if a corresponding increasing block rate structure for sewer service is not also adopted.

<sup>24</sup> While DWSD would not be required to address income qualification, utility systems typically (though not always) establish different customer classifications if billing non-uniform volumetric rates. Rate blocks appropriate for residential use are unlikely to be appropriate for industrial accounts, for example. So, in addition to populating account information with financially responsible party data, effort may be required to assign accounts to typical customer classifications (e.g., residential, commercial, industrial), for which data is currently unavailable.

change is needed in DWSD to place a higher emphasis on retail customer service. At the same time, there is recognition that past inconsistent and dysfunctional customer billing and collection practices, particularly regarding service disconnections, has precipitated a culture of non-payment among some segments of the customer population. Requisite cultural changes will require time, consistency, and demonstrated good faith on the part of both the Department and its customers.

- **Fairness.** BRPA members noted that cultural change would also be required should the City and DWSD leadership affirm that a fundamental objective of the Department is to advance universal access to essential water services. New fairness considerations would permit tailored responses to individual customers' circumstances – perhaps allowing for arrearage forgiveness or conservation assistance to enable economically strained customers to continue to pay for and receive services.
- **DWSD billing and collection.** DWSD's billing system constraints affect the viability and relative merit of selected options, particularly in defining short-term remedial measures. For example, while budget billing was generally viewed as a helpful potential enhancement, the BRPA found that it should not take precedence over other higher priority initiatives. Accordingly, BRPA recommendations are shaped by practical considerations in the Detroit context that may be different in other communities.

### *BRPA Member Evaluations*

A structured option evaluation exercise was conducted to help achieve consensus on practical, implementable recommendations to address water affordability in Detroit in both the short and long term. Each option was scored by BRPA members and DWSD leadership staff against the criteria listed above on a 0 – 10 scale, with 0 representing the lowest and 10 representing the highest score. Composite scores and rankings were calculated for each BRPA member, across different criteria weightings, and averaged across BRPA members alone, across DWSD leadership staff alone, and across both BRPA members and DWSD staff.<sup>33</sup> Results were noteworthy, and are summarized in the following observations:

#### **Rate Structure Options**

- Of the rate structure options evaluated, the Increasing block design was scored and ranked highest by all but two scorers. Across both BRPA members and DWSD staff, it scored and ranked highest among all evaluated water affordability options.

"A move to an increasing block rate, designed with affordability as one of its explicit objectives, is a reasonable and appropriate 'compromise' between those who argue for an explicit income-based affordability program and those who argue that any such explicit income-based affordability program is contrary to law."

- Roger Colton, co-Founder, Fisher Sheehan & Colton, and BRPA Member

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<sup>33</sup> A summary of BRPA and DWSD leadership team scoring and rankings is provided in Appendix IV.