District of Columbia Water and Sewer Authority

Cost of Service Study for Small Potomac Interceptor Users

April 19, 2022

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Prepared By:
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Prepared For:
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Our Ref:
30109402

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Robert Ryall
Associate Vice President

April 19, 2022

Mr. Syed Khalil
Director, Rates and Revenue
District of Columbia Water and Sewer Authority
5000 Overlook Avenue, SW
Washington, DC 20032

Subject: Cost of Service Study for Small Potomac Interceptor Users

Dear Mr. Khalil,

Arcadis District of Columbia, P.C. (“Arcadis”) is pleased to provide this Cost of Service Study for the Small Potomac Interceptor (“PI”) Users to the District of Columbia Water and Sewer Authority (“DC Water”). The purpose of this project was to determine the cost of providing service to the Small PI Users for fiscal year (“FY”) 2019, FY 2020, and FY 2021 so that true-up payments can be calculated, and to establish Small PI User wastewater rates to be assessed by DC Water to recover service costs from FY 2023 through FY 2025.

We trust that the findings of this report will help DC Water to adequately reconcile operating and capital-related costs attributable to the Small PI Users with the amounts collected in FY 2019 through FY 2021, while providing an accurate estimate of costs to be recovered from these customers in FY 2023 through FY 2025.

It has been a pleasure working with DC Water and we thank you and the rest of the DC Water staff forthe support provided throughout the project.

Sincerely,

Robert Ryall

Associate Vice President

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Executive Summary

This study was completed for the District of Columbia Water and Sewer Authority ("DC Water" or "Authority") by Arcadis District of Columbia, P.C. ("Arcadis") for the purposes of determining the actual cost of providing service to the Small Potomac Interceptor ("PI") Users for fiscal year ("FY") 2019, FY 2020, and FY 2021 so that a true-up payment could be calculated, and establishing Small PI User wastewater rates to be used by DC Water to recover service related costs from FY 2023 through FY 2025. An estimated true-up for FY 2022 was not completed and will instead be calculated in a future true-up that will analyze FY 2022, FY 2023, and FY 2024 using actual figures. DC Water's Small PI Users include the Town of Vienna ("Vienna"), the Dulles International Airport ("Dulles"), the National Park Service ("NPS"), and the Department of the Navy ("Navy").

In return for conveyance and treatment service provided by DC Water, the Small PI Users pay a proportionate share of DC Water's operating and capital costs on a rate per million gallons ("MG") of wastewater basis in accordance with wastewater service agreements that were executed in the 1960's ("Small PI User Agreements"). The Small PI User Agreements specify that the Small PI Users must pay DC Water a proportionate share of the following costs:

1. Operation, repair, and maintenance costs of the PI, including overhead, where applicable;
2. Operation, repair, maintenance, and replacement costs, as well as overhead, of DC Water facilities that handle, pump, or treat sewage conveyed by the PI to the Blue Plains Advanced Wastewater Treatment Plant ("WWTP");
3. The historical cost of the Blue Plains WWTP facilities (pre-1964 costs);
4. Amortized planning, design, construction, and initial operational costs associated with the PI;
5. Amortized planning, design, and construction costs of pipelines and pumping facilities that provide for the transport of flows from the PI to the Blue Plains WWTP; and
6. Amortized planning, design, and construction costs associated with additional treatment facilities to accommodate flows from the PI.

A cost of service evaluation was completed in accordance with terms of the Small PI User Agreements to determine the actual cost of providing wastewater service to the Small PI Users. The cost of service evaluation involved using actual (FY 2019 – FY 2021) eligible operating expenses, actual amortized capital costs, and actual wastewater flows, as well as existing reserve capacity shares to determine the actual cost to provide service to each of the Small PI Users in FY 2019, FY 2020, and FY 2021.

As part of the true-up analysis, the cost of service results were compared to the payments received from each Small PI User in each year to determine if the user had overpaid or underpaid for service. As part of this comparison, prior true-up credits as well as any past due amounts rolling forward were adjusted out of payments received during the period. The results of the true up analysis are shown in Table ES-1. In years where the amount paid exceeded the calculated cost of service total, the customer overpaid for wastewater service. Alternatively, in years where the amount paid was less than the calculated cost of service total, the customer underpaid for service.

Table ES-1. Small PI User True-Up Analysis Results

Description	Town of Vienna	Dulles	NPS	Navy	Total
FY 2019 (Actual[2])	$ 1,473,210	$ 1,582,437	$ 22,428	$ 75,663	$ 3,153,738
Amount Paid[1]	1,190,675	1,327,656	4,408	60,667	2,583,407
Difference	$ (282,535)	$ (254,781)	$ (18,020)	$ (14,996)	$ (570,332)
FY 2020 (Actual)	$ 1,477,408	$ 1,429,981	$ 22,852	$ 73,562	$ 3,003,803
Amount Paid	1,387,900	1,284,779	6,005	81,057	2,759,741
Difference	$ (89,509)	$ (145,201)	$ (16,847)	$ 7,495	$ (244,062)
FY 2021 (Actual)	$ 1,716,229	$ 1,446,314	$ 23,738	$ 75,570	$ 3,261,851
Amount Paid	2,115,551	1,230,243	8,249	81,280	3,435,323
Difference	$ 399,322	$ (216,071)	$ (15,489)	$ 5,709	$ 173,472
Total Difference FY 2019 - FY 2021	$ 27,278	$ (616,053)	$ (50,355)	$ (1,792)	$ (640,922)

[1]Amount Paid excludes prior true-up credits and FY 2018 past due portions rolling forward

[2]Actual costs per the cost of service analysis

As shown in Table ES-1, a net underpayment of approximately $641,000 was realized from the Small PI Users on a combined basis for FY 2019 through FY 2021. A more detailed discussion of each Small PI User's overpayment or underpayment by year and in total, as shown in Table ES-1, is included in the following paragraphs. The amount paid figures represent what each customer paid for service for each year and does not include past due balances or payments related to previous true-up periods.

Vienna:

The Town of Vienna underpaid for service in FY 2019 and FY 2020 and overpaid for service in FY 2021, resulting in a net overpayment for these three years of approximately $27,000.

Dulles:

Dulles International Airport underpaid for service in FY 2019, FY 2020, and FY 2021. This resulted in a total underpayment of approximately $616,000 for FY 2019 through FY 2021.

NPS:

The National Park Service underpaid for service in FY 2019, FY 2020, and FY 2021, resulting in a total underpayment of $50,000 over these three years.

Navy:

The Navy underpaid for service in FY 2019 and FY 2020 and overpaid for service in FY 2021. This resulted in a total underpayment of approximately $1,800 for these three years.

A cost of service evaluation for the Small PI Users was completed for FY 2023, FY 2024, and FY 2025 (the "forecast period") in accordance with the Small PI User Agreements. The evaluation was completed to calculate wastewater rates for the Small PI Users in these years. The cost of service evaluation involved projecting eligible operating expenses, amortized capital costs, and wastewater flows, as well as using existing reserve capacity shares, to calculate an average rate per million gallons ("MG") of wastewater flow for each Small PI User. This calculated rate is recommended to be used to recover their respective cost of service over the forecast period.

Projected cost recovery rates for Small PI Users were calculated by totaling the cost of service projections for FY 2023 through FY 2025 for each user and dividing this amount by the total projected wastewater flows for each user over this same period. This results in an average cost recovery rate for FY 2023 through FY 2025. This calculation is shown in Table ES-2. An average cost recovery rate for the three-year period was calculated, rather than calculating different cost recovery rates for each of the three years, to be consistent with the pricing provisions contained in the Small PI User Agreements, as these agreements specify that the cost recovery rate shall not be changed more frequently than once every three years.

Table ES-2. Calculated Cost Recovery Rates for Small PI Users for FY 2023 – FY 2025

Description	Town of Vienna	Dulles	NPS	Navy
Estimated Cost of Service:				
FY 2023	$ 1,739,098	$ 1,658,191	$ 26,575	$ 83,423
FY 2024	1,818,022	1,737,809	27,919	87,105
FY 2025	1,897,837	1,818,471	29,278	90,826
Total	$ 5,454,956	$ 5,214,471	$ 83,773	$ 261,355
Cost of Service (FY 2023 - FY 2025)	$ 5,454,956	$ 5,214,471	$ 83,773	$ 261,355
Projected Flows - FY 2023 to FY 2025 (MG)	1,075.42	913.82	4.50	54.75
Projected Rate (per MG)	$5,072.41	$5,706.26	$18,616.15	$4,773.69
Current Rate (per MG)	$4,485.27	$4,733.67	$7,321.20	$4,467.80
$ Change	$587.14	$972.59	$11,294.95	$305.89
% Change	13.1%	20.5%	154.3%	6.8%

As shown in Table ES-2, the calculated projected rates for Small PI Users range from $4,774 per MG to $18,616 per MG. As compared to existing rates, the projected rates are higher, due to a combination of factors such as projected increases in operating expenses, amortized capital costs, and changes in flow projections. Under the calculated rates, the Small PI Users are expected to realize increases in cost recovery rates ranging from 6.8 percent to 154.3 percent, as compared to the existing cost recovery rates.

NPS had the largest percentage increase as a result of decreased flows. The NPS actual costs for 2019 through 2021 represent a significantly larger portion than the Amount Paid, and the calculated NPS rate for 2023 through 2025 is higher than the current rate. These increases are attributable to a reduction in NPS flow which has been observed since 2018. Based on DC Water correspondence with NPS, the reduced flow is the result of a leak discovered and repaired in 2018, as well as facility closure due to COVID-19 protocol. Per the Small PI User Agreements, Capital Costs are allocated to small users based on their reservice capacity. As such, Capital Costs remain relatively constant while flows decline, resulting in an increase in the NPS rate. It is important to note that overall cost of service for NPS has been generally consistent since 2016.

1 Introduction

1.1 Scope and Objectives

This study was completed for the District of Columbia Water and Sewer Authority ("DC Water" or "Authority") by Arcadis District of Columbia, P.C. ("Arcadis") for the purpose of determining the cost of providing service to the Small Potomac Interceptor ("PI") Users for fiscal year ("FY") 2019, FY 2020, and FY 2021 so that a true-up payment could be calculated, and establishing Small PI User wastewater rates to recover service-related costs for FY 2023 through FY 2025. As DC Water is currently in the middle of FY 2022 and actual costs are not known, Arcadis did not determine an estimated true-up for FY 2022. The FY 2022 true-up will be completed in a future true-up cycle that will analyze FY 2022, FY 2023, and FY 2024 using actual results. DC Water's fiscal year ends on September 30th of each year. DC Water's Small PI Users include the following customers:

1. Town of Vienna ("Vienna")
2. Dulles International Airport ("Dulles")
3. National Park Service ("NPS")
4. Department of the Navy ("Navy")

1.2 Background

DC Water provides wastewater service to retail customers in the District of Columbia and wholesale customers in Montgomery and Prince George's counties in Maryland, as well as Fairfax and Loudoun counties in Virginia. DC Water's PI sanitary sewer system carries about 60 million gallons ("MG") per day of wastewater from various wholesale customers to the Potomac Pumping Station in Washington, DC. Flows from the pump station are then transported to the Blue Plains Advanced Wastewater Treatment Plant ("WWTP") for treatment. The PI was built following the enactment of Public Law 86- 515, which authorized the District of Columbia to construct, operate, and maintain a sanitary sewer system to connect Dulles to the Washington, DC sewer system.

The PI system consists of four primary interceptor segments including the PI main trunk, the Upper Potomac Interceptor ("UPI"), the Upper Potomac Interceptor Relief Sewer ("UPIRS"), and the Maryland Upper Potomac Interceptor ("MUPI"). The PI main trunk is located in Maryland and Virginia and includes the Sugarland Run Extension, the Difficult Run Extension, and the Upper Maryland Spur. The MUPI is located in Montgomery County, Maryland and conveys flows into the UPI at the DC line. The UPI starts at the Maryland/DC border and currently conveys flows from the MUPI and other service connections in Washington, DC to the UPIRS. The UPIRS begins at the DC border and conveys flow from the PI main trunk and other service connections to the Blue Plains WWTP. DC Water operates and maintains the PI system with the exception of the MUPI, which is operated and maintained by the Washington Suburban Sanitary Commission ("WSSC"). The jurisdictions served by the PI include the Small PI Users identified previously, as well as Loudoun County, VA; Fairfax County, VA; and WSSC. A schematic diagram of the PI and the locations of where the Small PI Customer's wastewater flow enter the PI is provided in Figure 1.

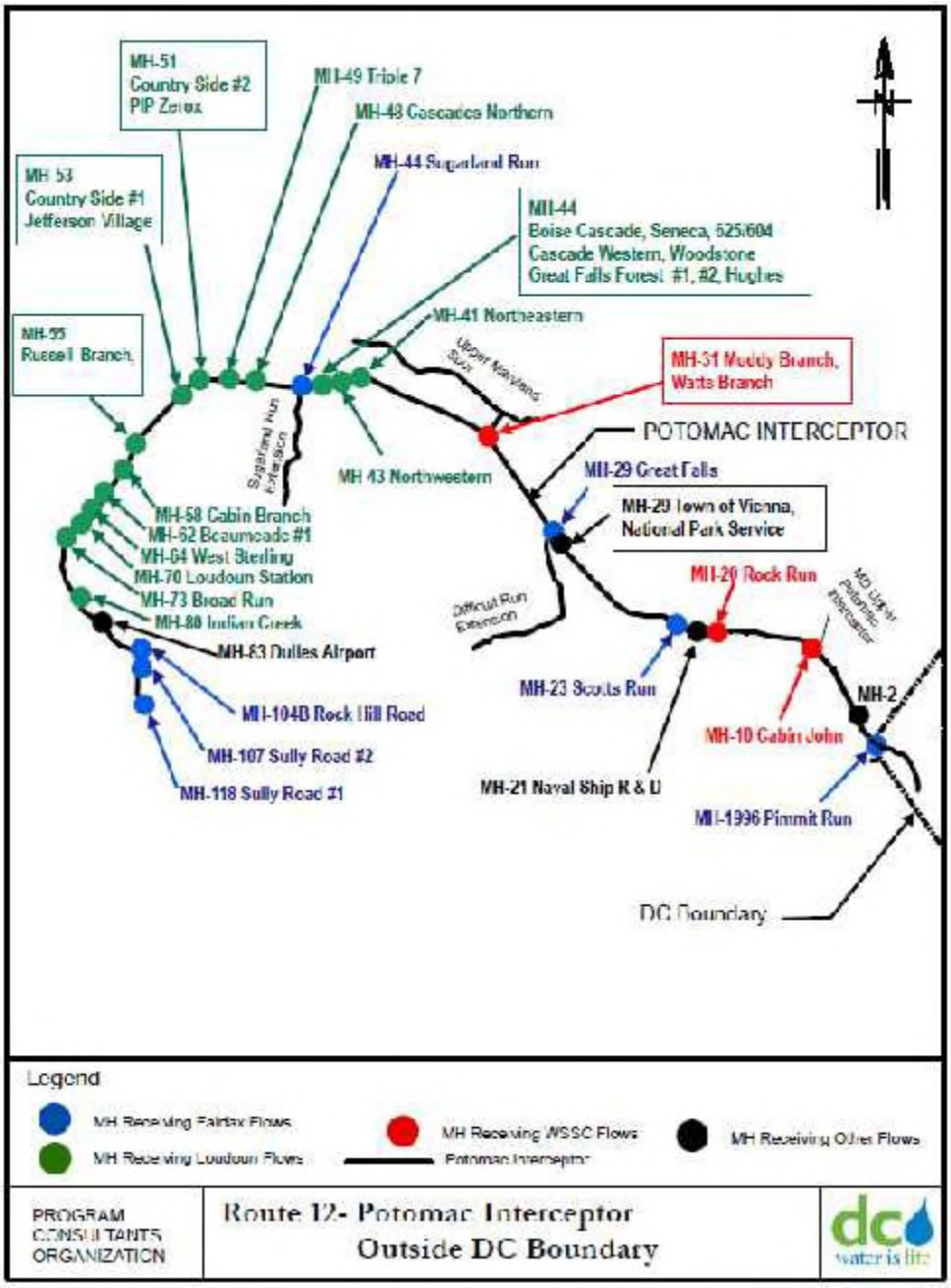

Figure 1 Potomac Interceptor Diagram

1.3 Small PI User Agreements

In return for conveyance and treatment service provided by DC Water, the Small PI Users pay a proportionate share of DC Water's operating and capital costs on a rate per MG of wastewater basis in accordance with wastewater service agreements that were executed in the 1960's ("Small PI User Agreements"). These agreements specify that the rates charged to the Small PI Users are to be adjusted at three-year or greater intervals, with periodic billing reconciliations as necessary.

In addition, the Small PI User Agreements state that the Small PI Users must pay DC Water a proportionate share of the following costs:

1. Operation, repair, and maintenance costs of the PI, including overhead, where applicable.
2. Operation, repair, maintenance, and replacement costs, as well as overhead, of DC Water facilities that handle, pump, or treat sewage conveyed by the PI to the Blue Plains WWTP.
3. The historical cost of the Blue Plains WWTP (pre-1964 costs).
4. Amortized planning, design, construction, and initial operational costs associated with the PI.
5. Amortized planning, design, and construction costs of pipelines and pumping facilities that provide for the transport of flows from the PI to the Blue Plains WWTP; and
6. Amortized planning, design, and construction costs associated with additional treatment facilities to accommodate flows from the PI.

A summary of the pertinent pricing provisions of the PI User Agreements are as follows:[1]

> *(A) Pursuant to the provisions of P.L. 86-515, it is the intent of the parties hereto that the Government shall pay:*
>
> *(1) The actual costs to the District for handling, pumping and treating all sewage discharged from Government sewers into the Potomac Interceptor System and thence into the sewerage systems of the Districtof Columbia;*
>
> *(2) The proportionate costs of operation, maintenance and amortization of the cost of planning and construction (including acquisition of rights-of-way) of the Potomac Interceptor System, excluding anyFederal Grants made for these purposes;*
>
> *(3) In proportion to its usage of the Potomac Interceptor System, the construction and amortization costs incurred by the District, excluding any Federal Grants applicable thereto, for the provision of facilities for handling, pumping and treating sewerage discharged or to be discharged by the Government thru connectionsto the Potomac Interceptor System; all as hereinafter more particularly set forth.*
>
> *(B) All of the elements of cost recited above shall be reflected in a single charge or service rate which when multiplied by the total volume of sewage, expressed in millions of gallons, delivered to the Interceptor from Government sewers will constitute the total cost to the Government for the sewage service provided hereunder for the period during which such sewage flows were recorded, or estimated, provided, however, that the amount of thecharge or service rate shall be adjusted from time to time to cover fully the actual costs to the District of providing the services and amortizing, as required by law, or otherwise reflecting the capital costs of facilities devoted to suchservices. At any time, the charge or service rate per million gallons shall consist of the*

[1] Agreement No. DCF-A-2530/I between DC Water and the National Park Service, dated August 18, 1964.

aggregate of the following amounts:

(1) An amount equal to the actual cost per million gallons of the total flow in the Interceptor, as recorded or estimated from all users thereof, for the total operation, repair and maintenance costs of the Interceptor including the rights-of-way and access roads therefor, the testing of meters and the services of engineers and others engaged to direct and perform these operations, administer the regulations and provide the services called for under this and similar agreements between the District and other users of the Interceptor, includingoverhead where applicable.

(2) An amount which shall be the actual cost to the District per million gallons for the operation, repair, maintenance and replacement, including overhead, of each District facility which handles, pumps or treatssewage or wastes conveyed by the Interceptor to the sewerage systems of the District.

(3) An amount, expressed as a unit cost per million gallons, which reflects the proportionate annual share of the historical cost of the District's sewage treatment plant, up to the date of connection of the Interceptor to theDistrict's sewerage systems, devoted to the treatment of sewage and wastes received from the Interceptor. As used herein the proportionate annual share of the historical cost of the plant shall be such portion of the cost as the total annual flow of sewage received from the interceptor bears to the total annual flow of all sewage received at the plant, computed on the historical costs of:

a. Conduits and piping at one percent (1%)

b. Buildings and tanks at one-and-one-half percent (1-1/2%)

c. Equipment at four percent (4%)

At such time as any facility as to which the amount under this Section is being paid shall be replaced, supplemented or augmented by another facility toward the cost of whose construction of Government shall bemaking payments pursuant to Section 4 (B) (6) shall be reduced in proportion to the resulting reduction in the use of the initial facilities for the treatment of sewage from the Interceptor.

(4) An amount which shall be the charge per million gallons necessary to amortize over a period of forty yearsthe loans from the United States to the Metropolitan Area Sewage Works Fund for the planning, design, construction, and initial operation, if necessary, of the Interceptor; such charges to be graduated over the life of the loans from zero, if warranted, to such maximum as may ultimately be necessary to fulfill the requirements of law.

(5) An amount which shall be the charge per million gallons necessary to amortize, over a period of thirty years, the loans from the United States to the District of Columbia sewage Works Fund for the planning, design and construction of those portions of the pipe lines and pumping facilities which are provided for the transport of flows from the Interceptor to the District of Columbia Sewage Treatment Plant; such charges to be graduated over the life of the loans from zero, if warranted, to such maximum as may ultimately be necessary to fulfill the requirements of law. The proportion of the cost of the pipe lines and pumping facilities provided for the transport of flows from the Interceptor shall be so much of the total cost of each such facility to the District as the maximum design capacity assigned therein for interceptor flows bears to the maximum design capacity assigned therein for all flows.

> *(6) An amount expressed as a charge per million gallons which shall be sufficient to cover the cost to the District of Columbia, exclusive of Federal Grants, if any, for planning, designing and constructing additionaltreatment facilities at the District of Columbia Sewage Treatment Plant as may become necessary from time to time to accommodate flows received from the Interceptor, or to enhance the degree of treatment provided such flows. The cost to the District as used in this subsection shall be taken to include long and short term loans taken by the District as well as current receipts of the District, if used for such purpose, all of which shall be amortized as to principal and interest over a period of not less than thirty years exclusively from the charges provided for in this Section 4 (B)(6).*

It should be noted that the agreement provisions included above are from the NPS Agreement with DC Water and that these and other provisions included in the agreement are essentially the same among the agreements with the Small PI Users, except for the agreement with Dulles. The agreement with Dulles contains the same pricing provisions as above, except that item (B)(4) is not included in the agreement. It is understood that the initial cost of the PI was partially funded by federal government grants that were made on behalf of Dulles; therefore, Dulles was not required to make any debt service payments associated with these loans.

2 True-Up Analysis

A true-up analysis was completed to determine the over- or underpayment of wastewater service costs by the Small PI Users to DC Water for FY 2019, FY 2020, and FY 2021. The true-up analysis consisted of completing the following steps:

1. Identify actual operating expenses and capital project costs for DC Water in FY 2019, FY 2020, and FY 2021.
2. Identify the actual amount of wastewater flows attributable to each Small PI User as compared to the total actual flows received at the Blue Plains WWTP in FY 2019, FY 2020, and FY 2021. Historical actual future wastewater flows were used to allocate operating costs to Small PI Users.
3. Identify each Small PI User's reserve capacity share of the total capacity of the Potomac Pumping Station and the Blue Plains WWTP. Reserve capacity shares were used to allocate amortized capital costs to Small PI Users.
4. Determine the cost to provide wastewater service to Small PI Users in FY 2019 through FY 2021 based on eligible operating expenses and amortized capital costs, as well as wastewater flows and reserve capacity shares.
5. Compare the actual cost of providing service to the Small PI Users with the amounts paid by the PI Users in FY 2019 through FY 2021.

2.1 Small PI Users Cost of Service

2.1.1 Operating Expenses

According to the Small PI User Agreements, Small PI Users are to share in the operating expenses of the PI, the facilities that convey flow from the PI to the Blue Plains WWTP, and share in the operating expenses of the Blue Plains WWTP itself. In addition to the direct expenses, the Small PI Users also share in the administrative expenses incurred by DC Water, as related to the operation of the PI and the Blue Plains WWTP.

A summary of the actual operating expenses by department in FY 2019 through FY 2021 are provided in Table 1. The table also shows the eligible percentage and the resulting eligible dollar amount of expenses allocable to PI Users from each department for each year. The eligible percentages of expenses pertaining to the departments listed under "Operations" were provided by DC Water based on their detailed tracking of the expenses allocable to Small PI Users for each department. The eligible percentage of Administration related expenses in FY 2019 through FY 2021 was also based on DC Water's detailed tracking of expenses allocable to Small PI Users.

In addition, the table shows two line items related to biosolids expenses. The purpose of the first line labeled, "Biosolids Cost (from GL)", is to subtract biosolids related expenses that have been captured under "Wastewater Treatment – Operations", as the full amount of biosolids expenses were not included under this departmental total. The purpose of the second, "Total Biosolids Cost", is to add-in the full amount of biosolids expenses that should have been included as actual expenses above. These amounts were provided by DC Water for FY 2019 through FY 2021.

Based on the actual operating expense information provided by DC Water, operating, repair, and maintenance expenses of the PI interceptor were unable to be isolated from DC Water's other conveyance system expenses in order to be distributed to the Small and other PI Users separately.

Therefore, the actual conveyance related expenses shown in Table 1 include total wastewater system conveyance expenses, and the eligible portion represents an estimate of the PI interceptor and common-to-all (i.e., DC Water retail customer and PI Users) portion of these expenses. This is consistent with how these expenses were handled as part of the prior Small PI Users Cost of Service Study.

Capital Equipment costs related to the Blue Plains WWTP and the Distribution and Conveyance System have been included in the operating expenses. While DC Water has not included Capital Equipment costs in past true-up analyses, these expenses were incurred by DC Water and are recoverable expenses under the pricing provisions included in the Small PI User Agreements. In addition, Capital Equipment costs are included in the projected rates for FY 2020 through FY 2022.

Table 1. Operating Expenses Eligible to be Allocated to Small PI Users

Description	FY 2019 Actual	FY 2019 Eligible %	FY 2019 Eligible $	FY 2020 Actual	FY 2020 Eligible %	FY 2020 Eligible $	FY 2021 Actual	FY 2021 Eligible %	FY 2021 Eligible $
Operations:									
WWT - Operations	$ 78,884	95.0%	$ 74,940	$ 70,780	95.0%	$ 67,241	$ 74,553	95.0%	$ 70,825
WWT - Process Engineering	6,892	100.0%	6,892	6,557	100.0%	6,557	5,870	100.0%	5,870
Maintenance Services	18,867	100.0%	18,867	18,690	100.0%	18,690	19,047	100.0%	19,047
Water Services	27,299	0.0%	-	59,830	0.0%	-	62,938	0.0%	-
Water Quality and Technology	-	0.0%	-	-	0.0%	-	-	0.0%	-
Sewer Services	11,938	0.0%	-	11,938	0.0%	-	14,891	0.0%	-
Customer Service	20,643	0.0%	-	19,563	0.0%	-	17,614	0.0%	-
Distribution and Conveyance Systems	54,888	35.3%	19,359	22,389	35.3%	7,897	20,763	35.3%	7,323
Engineering and Technical Services	21,564	0.0%	-	21,328	0.0%	-	21,451	0.0%	-
CIP Infrastructure Management	-	0.0%	-	1,453	0.0%	-	3,675	0.0%	-
Wastewater Engineering	1,471	0.0%	-	1,269	0.0%	-	2,384	0.0%	-
DC Clean Rivers	2,175	0.0%	-	1,927	0.0%	-	2,602	0.0%	-
Permit Operations	3,192	0.0%	-	3,385	0.0%	-	3,949	0.0%	-
Subtotal	$ 247,814		$ 120,058	$ 239,110		$ 100,384	$ 249,738		$ 103,065
Administration	$ 80,288	29.8%	$ 35,753	$ 80,326	31.3%	$ 31,430	$ 84,193	31.3%	$ 32,270
Other Adjustments:									
Biosolids Cost (from GL)	$ (1,439)	100.0%	$ (1,439)	$ (1,636)	100.0%	$ (1,636)	$ (1,537)	100.0%	$ (1,537)
Total Biosolids Costs	3,178	100.0%	3,178	3,795	100.0%	3,795	3,186	100.0%	3,186
Subtotal	$ 1,740		$ 1,740	$ 2,159		$ 2,159	$ 1,649		$ 1,649
Capital Equipment:									
WWTP - Operations	$ 24	95.0%	$ 23	$ 22	95.0%	$ 21	$ -	95.0%	$ -
WWTP - Process Engineering	484	100.0%	484	339	100.0%	339	453	100.0%	453
WWTP - Maintenance Services	1,295	100.0%	1,295	2,898	100.0%	2,898	3,211	100.0%	3,211
Distribution and Conveyance Systems	1,981	35.3%	699	1,785	35.3%	630	1,140	35.3%	402
Subtotal	$ 3,784		$ 2,500	$ 5,044		$ 3,887	$ 4,804		$ 4,066
Total	$ 333,625	48.0%	$ 160,052	$ 326,639	42.2%	$ 137,862	$ 340,384	41.4%	$ 141,050

2.1.2 Capital Costs

As specified in the Small PI User Agreements, the capital costs that are eligible to be shared by the Small PI Users include the following:

1. Capital costs of the PI (amortized over 40 years)
2. Capital costs of conveyance from the PI to WWTP (amortized over 30 years)
3. Capital costs of the WWTP (historical costs pre-1964 amortized over 30 years)
4. Additional capital costs of the WWTP (post-1964 amortized over 30 years)

Based on information provided by DC Water, there are no remaining unamortized capital costs associated with the PI (#1) or the WWTP costs pre-1964 (#3). Therefore, amortized costs pertaining to these facilities were not included in the true-up analysis. A summary of the historical actual (FY 1990 to FY 2021) capital project costs incurred by DC Water associated with conveyance infrastructure from the PI to the WWTP, additional capital costs of the Blue Plains WWTP, including the Montgomery County Composting Facility, and other common to all facilities (i.e., combined sewer overflow and sanitary sewer facilities), for the period from FY 1990 to FY 2021 is shown in Table 2. This information was provided by DC Water.

Under the Small PI User Agreements, these costs were amortized over 30 years and then allocated to Small PI Users based on each customer's reserve capacity share of the Potomac Pumping Station and the Blue Plains WWTP. The capital costs identified in each of these years were amortized using historical bond yields sourced from the Bond Buyer Revenue Bond Index for each year.

The amortized costs associated with conveyance infrastructure from the PI to the WWTP, additional capital costs of the Blue Plains WWTP, including the Montgomery County Composting Facility, and for other common to all facilities for the period from FY 1990 to FY 2021 is shown in Table 3. The annual totals of amortized capital costs in each year shown on Table 3 include costs incurred over the prior 30 years. For example:

- FY 2019 included costs incurred in FY 1990 through FY 2019.
- FY 2020 included costs incurred in FY 1991 through FY 2020.
- FY 2021 included costs incurred in FY 1992 through FY 2021.

Table 2. Capital Project Costs Eligible to be Amortized and Allocated to Small PI Users

Fiscal Year	Potomac Pump Station	Blue Plains WWTP	Montgomery County Composting Facility	Common-to-all CSO Related	Common-to-all Sanitary Sewers
1990	$ 508,700	$ 55,774,000	$ 6,355,000	$ -	$ -
1991	541,000	66,076,000	6,492,000	-	-
1992	111,000	34,240,000	4,028,000	-	-
1993	89,000	54,614,000	3,962,000	-	-
1994	878,000	35,311,000	660,500	-	-
1995	560,000	41,432,000	431,600	-	-
1996	95,000	26,268,000	330,500	-	-
1997	6,000	20,224,000	-	-	-
1998	-	27,610,775	-	115,233	30,715
1999	-	34,901,203	-	847,841	414,353
2000	-	60,473,044	-	562,093	42,970
2001	-	40,866,059	-	1,315,394	119,546
2002	-	71,860,266	-	461,667	375,933
2003	-	122,113,548	-	-	697,372
2004	-	108,294,288	-	2,308,475	915,998
2005	-	82,533,690	-	1,124,081	2,023,238
2006	-	68,101,669	-	3,183,104	4,513,656
2007	-	51,059,719	-	774,209	937,107
2008	-	88,921,808	-	1,101,424	3,297,517
2009	-	99,314,038	-	863,631	1,645,191
2010	-	102,564,000	-	(721,202)	2,456,005
2011	-	125,879,000	-	4,866,549	6,169,651
2012	-	253,305,000	-	5,987,308	6,683,662
2013	-	309,897,429	-	13,531,218	36,059,222
2014	-	315,943,137	-	19,918,688	20,098,132
2015	-	192,476,210	-	14,129,533	18,692,148
2016	-	149,158,976	-	230,424,422	44,505,413
2017	-	141,602,396	-	221,898,941	44,219,600
2018	-	87,025,390	-	168,285,106	46,296,092
2019	-	54,116,528	-	203,951,447	32,992,573
2020	-	63,632,587	-	188,483,127	26,126,027
2021	-	61,185,121	-	159,510,576	30,518,227

Table 3. Amortized Capital Costs Eligible to be Allocated to Small PI Users

Fiscal Year	Rate	Potomac Pump Station	Blue Plains WWTP	Montgomery County Composting Facility	Common-to-all CSO Related	Common-to-all Sanitary Sewers
1990	7.50%	$ 43,072	$ 4,722,454	$ 538,086	$ -	$ -
1991	7.50%	45,807	5,594,737	549,686	-	-
1992	6.25%	8,281	2,554,401	300,500	-	-
1993	6.00%	6,466	3,967,648	287,835	-	-
1994	6.63%	68,108	2,739,156	51,237	-	-
1995	6.00%	40,683	3,009,990	31,355	-	-
1996	6.00%	6,902	1,908,342	24,010	-	-
1997	7.00%	484	1,629,779	-	-	-
1998	5.41%	-	1,880,204	-	7,847	2,092
1999	5.42%	-	2,380,214	-	57,822	28,258
2000	6.06%	-	4,421,826	-	41,101	3,142
2001	5.53%	-	2,820,152	-	90,775	8,250
2002	5.42%	-	4,899,934	-	31,480	25,634
2003	5.15%	-	8,082,635	-	-	46,159
2004	5.13%	-	7,151,114	-	152,438	60,487
2005	4.92%	-	5,322,184	-	72,486	130,468
2006	5.13%	-	4,493,924	-	210,048	297,849
2007	4.60%	-	3,172,969	-	48,111	58,234
2008	4.99%	-	5,780,561	-	71,601	214,362
2009	5.76%	-	7,027,520	-	61,111	116,415
2010	4.86%	-	6,566,409	-	(46,173)	157,240
2011	5.29%	-	8,464,922	-	327,258	414,887
2012	4.77%	-	16,042,307	-	379,188	423,290
2013	4.52%	-	19,060,824	-	832,263	2,217,890
2014	5.10%	-	20,784,260	-	1,310,347	1,322,152
2015	4.32%	-	11,563,899	-	848,897	1,123,017
2016	3.52%	-	8,128,502	-	12,557,109	2,425,348
2017	3.90%	-	8,085,279	-	12,670,088	2,524,871
2018	4.45%	-	5,312,589	-	10,273,204	2,826,211
2019	3.89%	-	3,089,612	-	11,643,963	1,883,607
2020	2.76%	-	3,147,355	-	9,322,634	1,292,229
2021	2.54%	-	2,937,541	-	7,658,216	1,465,202

2.1.3 Units of Service

Eligible operating expenses were allocated to Small PI Users according to each user's actual wastewater flow in proportion to the total wastewater flow received at the Blue Plains WWTP in each fiscal year. The actual wastewater flows for each Small PI User from FY 2019 through FY 2021 are shown in Table 4. Eligible common-to-all conveyance related expenses were allocated to Small PI Users based on the actual wastewater flows shown in this table.

Table 4. Actual (FY 2019 – FY 2021) Small PI User Flows

Description	Town of Vienna	Dulles	NPS	Navy	All Other	Total
Actual Flows FY 2019 (MG)	286.64	361.92	0.88	18.14	109,635.41	110,303.00
Actual Flows FY 2019 %	0.260%	0.328%	0.001%	0.016%	99.395%	100.000%
Actual Flows FY 2020 (MG)	309.44	271.41	0.82	18.14	109,922.19	110,522.00
Actual Flows FY 2020 %	0.280%	0.246%	0.001%	0.016%	99.457%	100.000%
Actual Flows FY 2021 (MG)	471.67	259.89	1.13	18.47	109,916.85	110,668.00
Actual Flows FY 2021 %	0.426%	0.235%	0.001%	0.017%	99.321%	100.000%

MG = Million gallons

Source: FY 2019 – FY 2021 wastewater flows from the Small PI User quarter billing statements and Blue Plains WWTP Flow Report provided by DC Water.

The eligible amortized capital costs were then allocated to each Small PI User according to each Small PI User's reserve capacity shares as compared to the total capacities of the Potomac Pumping Station and the Blue Plains WWTP, based on the Small PI User Agreements. The capacities for each Small PI User were provided by DC Water and are shown in Table 5. Actual eligible amortized common-to-all CSO and sanitary sewer capital costs were allocated to Small PI Users based on their capacity shares at the Blue Plains WWTP, which is consistent with how these costs were allocated as part of the prior Small PI Users Cost of Service Study. Eligible amortized capital costs associated with the Montgomery County Composting Facility were allocated to Small PI Users based on their capacity shares at the Blue Plains WWTP as well.

Table 5. Small PI User Reserve Capacity Shares per DC Water

Description	Town of Vienna	Dulles	NPS	Navy	All Other	Total
Potomac Sewer Pump Station (MGD)	3.480	3.480	0.070	0.160	458.850	466.040
Potomac Sewer Pump Station %	0.747%	0.747%	0.015%	0.034%	98.457%	100.000%
Blue Plains WWTP (MGD)[1]	1.500	1.500	0.030	0.070	366.900	370.000
Blue Plains WWTP %	0.405%	0.405%	0.008%	0.019%	99.162%	100.000%

MGD = Million gallons per day

[1]Amortized costs for the Blue Plains WWTP and common-to-all combined sewer overflow and sanitary sewer facilities were allocated to Small PI Users based on the Blue Plains WWTP allocation.

Source: Potomac Sewer PS flow capacities were provided by DC Water. Blue Plains WWTP flow capacities were sourced from Section 4 of the 2012 IMA.

2.1.4 Allocation of Costs

A summary of the allocation of FY 2019 through FY 2021 costs to serve the Small PI Users is provided in Table 6. These allocations were derived by multiplying the eligible operating and amortized capital costs by the units of service percentages for each Small PI User as described previously.

Table 6. Actual Cost to Serve Small PI Users

Description	Town of Vienna	Dulles	NPS	Navy
Operating Expenses:				
FY 2019	$ 415,926	$ 525,153	$ 1,282	$ 26,324
FY 2020	385,979	338,552	1,023	22,630
FY 2021	601,156	331,242	1,436	23,534
Amortized Capital Costs:				
FY 2019	$ 1,057,284	$ 1,057,284	$ 21,146	$ 49,339
FY 2020	1,091,429	1,091,429	21,829	50,932
FY 2021	1,115,073	1,115,073	22,302	52,036
Total Cost of Service:				
FY 2019	$ 1,473,210	$ 1,582,437	$ 22,428	$ 75,663
FY 2020	1,477,408	1,429,981	22,852	73,562
FY 2021	1,716,229	1,446,314	23,738	75,570

2.2 Comparison of Cost of Service to Actual Payments

A comparison of the actual amounts paid by the Small PI Users in FY 2019 through FY 2021 with the actual and estimated cost to serve these customers in those years is shown in Table 7. In years where the amount paid exceeded the calculated cost of service total, the customer overpaid for wastewater service. Alternatively, in years where the amount paid was less than the calculated cost of service total, the customer underpaid for service.

As shown in Table 7, on a combined basis for FY 2019 through FY 2021, a net underpayment of approximately $641,000 was realized from the Small PI Users. The Amount Paid figures represent what each customer paid for service for each year and does not include past due balances or payments related to previous true-up periods. A further discussion of the over- or underpayments for each Small PI User is contained in the following paragraphs.

Table 7. Comparison of Small PI User Cost of Service with Actual Amounts Paid

Description	Town of Vienna	Dulles	NPS	Navy	Total
FY 2019 (Actual[2])	$ 1,473,210	$ 1,582,437	$ 22,428	$ 75,663	$ 3,153,738
Amount Paid[1]	1,190,675	1,327,656	4,408	60,667	2,583,407
Difference	$ (282,535)	$ (254,781)	$ (18,020)	$ (14,996)	$ (570,332)
FY 2020 (Actual)	$ 1,477,408	$ 1,429,981	$ 22,852	$ 73,562	$ 3,003,803
Amount Paid	1,387,900	1,284,779	6,005	81,057	2,759,741
Difference	$ (89,509)	$ (145,201)	$ (16,847)	$ 7,495	$ (244,062)
FY 2021 (Actual)	$ 1,716,229	$ 1,446,314	$ 23,738	$ 75,570	$ 3,261,851
Amount Paid	2,115,551	1,230,243	8,249	81,280	3,435,323
Difference	$ 399,322	$ (216,071)	$ (15,489)	$ 5,709	$ 173,472
Total Difference FY 2019 - FY 2021	$ 27,278	$ (616,053)	$ (50,355)	$ (1,792)	$ (640,922)

[1]Amount Paid excludes prior true-up credits and FY 2018 past due portions rolling forward

[2]Actual costs per the cost of service analysis

Vienna:

The Town of Vienna underpaid for service in FY 2019 and FY 2020 and overpaid for service in FY 2021, resulting in a net overpayment for these three years of approximately $27,000.

Dulles:

Dulles International Airport underpaid for service in FY 2019, FY 2020, and FY 2021. This resulted in a total underpayment of approximately $616,000 for FY 2019 through FY 2021.

NPS:

The National Park Service underpaid for service in FY 2019, FY 2020, and FY 2021, resulting in a total underpayment of $50,000 over these three years.

Navy:

The Navy underpaid for service in FY 2019 and FY 2020 and overpaid for service in FY 2021. This resulted in a total underpayment of approximately $1,800 for these three years.

For FY 2020 and FY 2021, the projections of operating expenses, eligible operating expenses, eligible capital project costs, eligible amortized capital project costs, and wastewater flows from the prior Small PI Users Cost of Service Study completed in 2019 were compared with the actual results provided by DC Water and are shown in Table 8. FY 2019 projections are from the 2016 Small PI Users Cost of Service Study. This table illustrates the reason for the annual over- and under-payments made by the PI users that are shown in Table 7. The following conclusions can be made based on the comparisons shown in the table:

- In comparison to the projected operating expenses for FY 2019 through FY 2021, projected in the prior Small PI Users Cost of Service Studies, actual operating expenses in these years were approximately $8.3 million to $27.8 million lower. This was primarily due to lower actual Wastewater Treatment – Operations expenses. In general, lower actual operating expenses result in overpayments by Small PI Users.

- Operating expenses eligible to be allocated to the Small PI Users were higher than projected in FY 2019 by approximately $18.9 million and lower in FY 2020 and FY 2021 by approximately $17.0 and $18.9 million, respectively. The FY 2019 increase is largely attributable to higher allocation of Distribution and Conveyance System costs, as compared to the projection. The decreases as compared to actual in FY 2020 and FY 2021 were primarily due to lower Wastewater-Treatment Operation expenses and lower Distribution and Conveyance System expenses. In general, higher actual eligible operating expenses will result in an underpayment from Small PI Users, while lower actual eligible operating expenses will result in overpayments.
- Actual eligible capital costs were lower than projected in FY 2021, by approximately $31.8 million. The costs were higher than projected in FY 2019 and FY 2020 by $172.0 million and $16.5 million respectively. In FY 2019 Common-to-All CSO-Related project costs were higher than projected. FY 2020 and FY 2021 also had higher Common-to-All CSO Related project costs than projected while Sanitary Sewer and the Blue Plains WWTP were lower than projected. In general, lower actual eligible capital costs will result in overpayments from Small PI Users.
- The eligible project costs resulted in lower eligible amortized capital costs for each year. The amortization periods were unchanged from the projections. The rates used to amortize these costs did drop significantly. For example, the prior projection used a rate of 4.166% for FY 2020; however, actual data from the Bond Buyer Index yields a rate of 2.762%.
- Actual wastewater flows attributable to Small PI Users were lower than projected in the previous cost of service study. Flows lower than projected could be the result of COVID-19 impacts. As shown in Table 8, actual Small PI User wastewater flows were 17 MG to 164 MG lower than what was projected. In general, lower actual wastewater flows will result in underpayments from Small PI Users, as these customers paid a lower proportion of capital costs, which are allocated based on capacity share but billed based on actual wastewater flow. Additionally, the Small PI Users generally had a lower actual percentage share of flow in FY FY 2020, and FY 2021 than was previously projected. The detail of these changes is provided in Table 9.

Table 8. Comparison of Prior COS Study Projections and Actual Results

Table 8. Comparison of Projected and Actual Costs and Flows

Description	FY 2019	FY 2020	FY 2021
Total Operating Expenses:			
Projected	$ 341,911,658	$ 354,468,508	$ 366,319,157
Actual	333,625,380	326,639,329	340,384,321
Difference	$ (8,286,278)	$ (27,829,179)	$ (25,934,836)
Eligible Operating Expenses:			
Projected	$ 141,161,671	$ 154,837,605	$ 159,948,213
Actual	160,051,806	137,861,655	141,050,289
Difference	$ 18,890,135	$ (16,975,950)	$ (18,897,925)
Eligible Capital Costs:			
Projected	$ 119,056,447	$ 261,693,000	$ 282,989,000
Actual	291,060,548	278,241,741	251,213,923
Difference	$ 172,004,101	$ 16,548,741	$ (31,775,077)
Eligible Amortized Capital Costs:			
Projected	$ 7,499,388	$ 15,441,010	$ 16,637,016
Actual	16,617,182	13,762,219	12,060,959
Difference	$ 9,117,794	$ (1,678,791)	$ (4,576,057)
Wastewater Flows (MG):[1]			
Projected	685.29	763.88	768.39
Actual	667.59	599.81	751.15
Difference	(17.70)	(164.06)	(17.24)

[1]Wastewater flows attributable to Small PI Users only.

As shown in Table 8, the calculated true-up amounts in Table 7 are the result of differences between projected and actual operating expenses and amortized capital costs allocated to Small PI Users, as well as differences in projected and actual flow volumes of Small PI Users, other PI Users, and retail customers.

Projected and actual reserve capacity shares remained unchanged on a year to year basis. A detailed analysis of these differences and how they contributed to the actual and estimated over- and underpayment amounts calculated for each Small PI User from FY 2019 through FY 2021, is provided in Table 9.

Table 9. Supporting Rationale for Calculated True-Up Amounts

Description	Town of Vienna	Dulles International Airport	National Park Service	Department of the Navy
2019	*Underpaid $282,535*	*Underpaid $254,781*	*Underpaid $18,020*	*Underpaid $14,996*
Operating Costs	+ $53,183, or 14.7% increase	+ $108,749, or 26.1% increase	- $4,089, or 76.1% decrease	+ $4,860, or 22.6% increase
Amortized Capital	+ $172,362 or 19.5% increase	+ $172,362, or 19.5% increase	+ $3,447, or 19.5% increase	+ $8044, or 19.5% decrease
WW Flow (MG)	- 21.78, or 7.1% decrease	+ 7.87, or 2.2% increase	-3.68, or 80.6% decrease	-0.11, or 0.6% decrease
WW Flow % of Total	1.1% increase	11.2% increase	78.9% decrease	8.2% increase
Reserve Capacity Share	No Change	No Change	No Change	No Change
2020	*Underpaid $89,509*	*Underpaid $145,201*	*Underpaid $16,847*	*Overpaid $7,495*
Operating Costs	- $179,399, or 31.7% decrease	- $177,033, or 34.3% decrease	- $4,792, or 82.4% decrease	- $3909, or 14.7% decrease
Amortized Capital	- $18,014, or 1.6% decrease	- $18,014, or 1.6% decrease	- $360, or 1.6% decrease	- $841, or 1.6% decrease
WW Flow (MG)	- 78.49, or 20.2% decrease	- 82.34, or 23.3% decrease	- 3.17, or 79.4% decrease	- 0.07, or 79.4% decrease
WW Flow % of Total	23.3% decrease	26.3% decrease	80.2% decrease	4.2% decrease
Reserve Capacity Share	No Change	No Change	No Change	No Change
2021	*Overpaid $399,322*	*Underpaid $216,071*	*Underpaid $15,489*	*Overpaid $5,709*
Operating Costs	+ $20,490, or 3.5% increase	- $205,048, or 38.2% decrease	- $4,536, or 76.0% decrease	- $3,722 or 13.7% decrease
Amortized Capital	- $36,566, or 3.2% decrease	- $36,566, or 3.2% decrease	- $731, or 3.2% decrease	- $1,706, or 3.2% decrease
WW Flow (MG)	+ 83.75, or 21.6% increase	- 98.38, or 27.5% decrease	- 2.86, or 71.8% decrease	+ 0.26, or 1.4% increase
WW Flow % of Total	17.4% increase	30% decrease	72.7% decrease	2.1% decrease
Reserve Capacity Share	No Change	No Change	No Change	No Change

3 Wastewater Rate Projections

3.1 Small PI Users Cost of Service Projection

A cost of service evaluation for the Small PI Users was completed for FY 2023, FY 2024, and FY 2025 (the "forecast period") to calculate wastewater rates for the Small PI Users in these years. It is anticipated that DC Water will assess these rates to users in these years to equitably and adequately recover the cost of wastewater service. The projected cost of service evaluation consisted of completing the following steps:

1. Forecast DC Water's future operating expenses and identify planned eligible capital project costs over the forecast period.
2. Forecast the actual amount of wastewater flows attributable to each Small PI User as compared to the total actual flows received at the Blue Plains WWTP in each year of the forecast period. Projected future wastewater flows were used to allocate eligible operating expenses to Small PI Users.
3. Identify each Small PI User's reserve capacity share of the total capacity of the Potomac Pumping Station and the Blue Plains WWTP. Reserve capacity shares were used to allocate eligible amortized capital costs to Small PI Users.
4. Estimate the projected cost to provide wastewater service to the Small PI Users in FY 2023, FY 2024, and FY 2025 based on allocations of eligible operating expenses and amortized capital costs, wastewater flows, and reserve capacity shares.
5. Estimate the total cost to serve each Small PI User over the forecast period and divide this amount by each user's projected wastewater flows over the forecast period. The results are the rates per MG of wastewater flow that should be charged to each Small PI User to recover wastewater service costs over the forecast period.

3.1.1 Operating Expense Projections

The budgeted operating expenses contained in DC Water's approved budget for FY 2022 were used to project operating expenses over the forecast period. Operating expenses were projected using an escalation factor of 3.4 percent per year, which was consistent with what is used for internal financial planning purposes by DC Water. The projected operating expenses by department for FY 2023 through FY 2025 are provided in Table 10. The table also shows the eligible percentage and the resulting eligible dollar amount of expenses allocable to PI Users from each department in each year. The eligible percentages of expenses pertaining to the departments listed under "Operations" were provided by DC Water based on their detailed tracking of the expenses allocable to PI Users for each department. The eligible percentage of Administration related expenses was based on the average of historical eligibility percentages.

In addition, the table shows two line items related to biosolids expenses. The purpose of the first line labeled, "Biosolids Cost (from GL)", is to subtract biosolids related expenses that have been captured under "Wastewater Treatment – Operations", as the full amount of biosolids expenses were not included under the departmental total. The purpose of the second, "Total Biosolids Cost", is to add-in the full amount of biosolids expenses that should have been included as projected expenses above.

Capital equipment costs related to the Blue Plains WWTP and to the Distribution and Conveyance Systems have also been included in the projection which is consistent with Small PI User Agreements and projections prepared in prior studies. These expenses are anticipated to be incurred by DC Water and are recoverable expenses under the pricing provisions included in the Small PI User Agreements.

Based on the actual operating expense information provided by DC Water, operating, repair, and maintenance expenses of the PI interceptor were unable to be isolated from DC Water's other conveyance system expenses in order to be distributed to the Small and other PI Users separately. Therefore, the projected conveyance related expenses shown in Table 10 include total wastewater system conveyance expenses and the eligible portion represents an estimate of the PI interceptor and common- to-all (i.e., DC Water retail customer and PI Users) portion of these expenses. This is consistent with how these expenses were handled as part of prior Small PI Users Cost of Service Studies.

Table 10. Projected Operating Expenses Eligible to be Allocated to Small PI Users

Description	FY 2023 Projected	FY 2023 Eligible %	FY 2023 Eligible $	FY 2024 Projected	FY 2024 Eligible %	FY 2024 Eligible $	FY 2025 Projected	FY 2025 Eligible %	FY 2025 Eligible $
Operations:									
Wastewater Treatment - Operations	$ 79,670	95.0%	$ 75,686	$ 82,378	95.0%	$ 78,260	$ 85,179	95.0%	$ 80,920
Wastewater Treatment - Process Engineering	7,624	100.0%	7,624	7,883	100.0%	7,883	8,151	100.0%	8,151
Maintenance Services	21,485	100.0%	21,485	22,216	100.0%	22,216	22,971	100.0%	22,971
Water Services	68,705	0.0%	-	71,041	0.0%	-	73,457	0.0%	-
Water Quality and Technology	-	0.0%	-	-	0.0%	-	-	0.0%	-
Sewer Services	-	0.0%	-	-	0.0%	-	-	0.0%	-
Customer Service	22,093	0.0%	-	22,845	0.0%	-	23,621	0.0%	-
Distribution and Conveyance Systems	39,235	35.3%	13,838	40,569	35.3%	14,309	41,948	35.3%	14,795
Engineering and Technical Services	22,203	0.0%	-	22,958	0.0%	-	23,739	0.0%	-
CIP Infrastructure Management	4,404	0.0%	-	4,554	0.0%	-	4,708	0.0%	-
Wastewater Engineering	3,162	0.0%	-	3,269	0.0%	-	3,381	0.0%	-
DC Clean Rivers	4,236	0.0%	-	4,380	0.0%	-	4,529	0.0%	-
Permit Operations	4,475	0.0%	-	4,627	0.0%	-	4,785	0.0%	-
Subtotal	$ 277,293		$ 118,634	$ 286,721		$ 122,667	$ 296,469		$ 126,838
Administration	$ 100,931	31.3%	$ 37,144	$ 104,362	31.3%	$ 38,407	$ 107,911	31.3%	$ 39,713
Other Adjustments:									
Biosolids Cost (from GL)	$ (1,590)	100.0%	$ (1,590)	$ (1,644)	100.0%	$ (1,644)	$ (1,700)	100.0%	$ (1,700)
Total Biosolids Costs	3,502	100.0%	3,502	3,621	100.0%	3,621	3,744	100.0%	3,744
Subotal	$ 1,912		$ 1,912	$ 1,977		$ 1,977	$ 2,044		$ 2,044
Capital Equipment:									
WWTP - Operations	$ 50	95.0%	$ 48	$ 88	95.0%	$ 84	$ 50	95.0%	$ 48
WWTP - Process Engineering	400	100.0%	400	400	100.0%	400	400	100.0%	400
WWTP - Maintenance Services	4,000	100.0%	4,000	4,000	100.0%	4,000	4,000	100.0%	4,000
Distribution and Conveyance Systems	1,765	35.3%	623	1,765	35.3%	623	1,765	35.3%	623
Subtotal	$ 6,215		$ 5,070	$ 6,253		$ 5,106	$ 6,215		$ 5,070
Total	$ 386,351	42.1%	$ 162,760	$ 399,314	42.1%	$ 168,158	$ 412,640	42.1%	$ 173,665

3.1.2 Capital Cost Projections

According to the Small PI User Agreements, the capital costs that were eligible to be shared with the Small PI Users include the following:

1. Capital cost of the PI (amortized over 40 years)
2. Capital costs of conveyance from the PI to WWTP (amortized over 30 years)
3. Capital costs of the WWTP (historical costs pre-1964)
4. Additional capital costs of the WWTP (post-1964 amortized over 30 years)

As discussed previously, there are no remaining unamortized capital costs associated with the PI (#1) or the WWTP costs pre-1964 (#3). Therefore, these facilities were not included in the projection. A summary of the planned future capital project costs anticipated to be incurred by DC Water that are associated with conveyance infrastructure from the PI to the WWTP, the additional capital costs of the Blue Plains WWTP, including the Montgomery County Composting Facility, and for other common to all facilities (i.e., combined sewer overflow and sanitary sewer facilities), for the period from FY 2023 to FY 2025, is shown in Table 11. Capital project costs from FY 1994 through FY 2022 that were eligible to be amortized and allocated to Small PI Users are included in Table 2.

Under the Small PI User Agreements, these costs were amortized over 30 years and then allocated to Small PI Users based on each customer's reserve capacity share of the Potomac Pumping Station and the Blue Plains WWTP. The capital costs identified in each of these years were amortized using historical revenue bond yields sourced from the Bond Buyer Revenue Bond Index for each year through 2021. Yields from 2022 to 2025 were estimated based on a historical five-year average.

The amortized costs associated with conveyance infrastructure from the PI to the WWTP, the additional capital costs of the Blue Plains WWTP, including the Montgomery County Composting Facility, and for other common to all facilities for the period from FY 2023 to FY 2025 is shown in Table 12. Amortized capital project costs from FY 1994 through FY 2021 that were eligible to be allocated to Small PI Users are included in Table 3. The annual totals of amortized capital costs in each year shown in Table 3 and Table 12 include costs incurred over the prior 30 years. For example:

- FY 2023 included costs incurred in FY 1994 through FY 2023.
- FY 2024 included costs incurred in FY 1995 through FY 2024.
- FY 2024 included costs incurred in FY 1996 through FY 2025.

Table 11. Planned Capital Project Costs Eligible to be Amortized and Allocated to Small PI Users

Fiscal Year	Blue Plains WWTP	Montgomery County Composting Facility	Common-to-all CSO Related	Common-to-all Sanitary Sewers
2023	$ 78,574,000	$ -	$ 117,704,000	$ 103,383,000
2024	117,545,000	-	77,304,000	150,828,000
2025	116,402,000	-	105,185,000	130,967,000

Table 12. Amortized Capital Costs Eligible to be Allocated to Small PI Users

Fiscal Year	Rate	Blue Plains WWTP	Montgomery County Composting Facility	Common-to-all CSO Related	Common-to-all Sanitary Sewers
2023	3.51%	$ 4,276,517	$ -	$ 6,406,231	$ 5,626,788
2024	3.51%	6,397,577	-	4,207,396	8,209,059
2025	3.51%	6,335,368	-	5,724,864	7,128,091

3.1.3 Units of Service Projections

Based on the Small PI User Agreements and as discussed previously, projected eligible operating expenses were allocated to Small PI Users according to each user's projected wastewater flow in proportion to the total wastewater flow received at the Blue Plains WWTP in each year of the forecast period. The projected wastewater flows for each Small PI User over the forecast period are shown in Table 13. In most cases, projected flows are based on the average historical flows from FY 2019 through FY 2021. However, reduced flow for NPS facilities were observed. The flow reductions were found to be contributed by two factors. In 2018, a leak as found and repaired, resulting in lower consumption in 2018 and 2019. Beginning March of 2020 through much of 2021, NPS facilities were closed due to the COVID-19 pandemic. As a result of the facility closures, consumption was lower than prior years. Based on correspondence between DC Water and NPS, future NPS flows are projected to be near 2018 levels of 1.50 MG per year.

Similarly, as a result of the pandemic, Dulles experienced passenger declines in 2020 and 2021. Since passenger activity is a key driver of water consumption and wastewater discharge, Dulles experienced reduced flows over this period. The 2023 through 2025 flow projection for Dulles is based on an average of 2019, 2020, and 2021 flows, incorporating pre-pandemic and post-pandemic levels. The flow forecast flow for Dulles is approximately 15% below 2019 pre-pandemic levels. Dulles has indicated they are projecting 2022 passenger activity to be 20% below pre-pandemic levels.

Eligible common-to-all conveyance related expenses were allocated to Small PI Users based on the projected wastewater flows shown in this table.

Table 13. Projected PI User Wastewater Flows

Description	Town of Vienna	Dulles	NPS	Navy	All Other	Total
Projected Flows FY 2023 (MG)	357.62	301.90	1.50	18.25	111,418.79	112,098.06
Actual Flows FY 2023 %	0.319%	0.269%	0.001%	0.016%	99.394%	100.000%
Projected Flows FY 2024 (MG)	358.47	304.60	1.50	18.25	112,259.31	112,942.13
Actual Flows FY 2024 %	0.317%	0.270%	0.001%	0.016%	99.395%	100.000%
Projected Flows FY 2025 (MG)	359.32	307.32	1.50	18.25	113,106.16	113,792.55
Actual Flows FY 2025 %	0.316%	0.270%	0.001%	0.016%	99.397%	100.000%

Based on the Small PI User Agreements and as discussed previously, eligible amortized capital costs were allocated to Small PI Users according to each Small PI User's wastewater capacity shares as compared to the

total capacities of the Potomac Pumping Station and the Blue Plains WWTP, respectively. The capacities for each Small PI User are shown in Table 14 and were unchanged from those used as part of the true-up analysis (Table 5). Actual and projected eligible amortized common-to-all CSO and sanitary sewer capital costs were allocated to Small PI Users based on their capacity shares at the Blue Plains WWTP, which is consistent with how these costs were allocated as part of the prior Small PI Users Cost of Service Study. Eligible amortized capital costs associated with the Montgomery County Composting Facility were allocated to Small PI Users based on their capacity shares at the Blue Plains WWTP as well.

Table 14. Projected PI User Reserve Capacity Shares

Description	Town of Vienna	Dulles	NPS	Navy	All Other	Total
Potomac Sewer Pump Station (MGD)	3.480	3.480	0.070	0.160	458.850	466.040
Potomac Sewer Pump Station %	0.747%	0.747%	0.015%	0.034%	98.457%	100.000%
Blue Plains WWTP (MGD)[1]	1.500	1.500	0.030	0.070	366.900	370.000
Blue Plains WWTP %	0.405%	0.405%	0.008%	0.019%	99.162%	100.000%

MGD = Million gallons per day

[1]Amortized costs for common-to-all combined sewer overflow and sanitary sewer facilities were allocated to Small PI Users based on the Blue Plains WWTP allocation.

Source: Potomac Sewer PS flow capacities were provided by DC Water. Blue Plains WWTP flow capacities were sourced from the Section 4 of the 2012 IMA.

3.1.4 Allocation of Estimated Costs to the Small PI Users

A summary of the allocation of FY 2023 through FY 2025 costs to serve the Small PI Users is provided in Table 15. The allocations were derived by multiplying the eligible operating and amortized capital costs by the units of service percentages for each Small PI User as described previously.

Table 15. Projected Cost to Serve Small PI Users

Description	Town of Vienna	Dulles	NPS	Navy
Operating Expenses:				
FY 2023	$ 519,250	$ 438,344	$ 2,178	$ 26,497
FY 2024	533,722	453,510	2,233	27,172
FY 2025	548,380	469,014	2,289	27,852
Amortized Capital Costs:				
FY 2023	$ 1,219,847	$ 1,219,847	$ 24,397	$ 56,926
FY 2024	1,284,300	1,284,300	25,686	59,934
FY 2025	1,349,456	1,349,456	26,989	62,975
Total Cost of Service:				
FY 2023	$ 1,739,098	$ 1,658,191	$ 26,575	$ 83,423
FY 2024	1,818,022	1,737,809	27,919	87,105
FY 2025	1,897,837	1,818,471	29,278	90,826

3.2 Calculation of Cost Recovery Rates

Projected cost recovery rates for Small PI Users were calculated by totaling the cost of service projections for FY 2023 through FY 2025 for each user and dividing this amount by the total projected wastewater flows for each user over this same time period. This results in an average cost recovery rate for the forecast period. This calculation is shown in Table 16. An average cost recovery rate for the three-year period was calculated, rather than calculating different cost recovery rates for each of the three years, to be consistent with the pricing provisions contained in the Small PI User Agreements, as these agreements specify that the cost recovery rate shall not be changed more frequently than once every three years.

Table 16. Calculated Cost Recovery Rates for Small PI Users for FY 2023 - FY 2025

Description	Town of Vienna	Dulles	NPS	Navy
Estimated Cost of Service:				
FY 2023	$ 1,739,098	$ 1,658,191	$ 26,575	$ 83,423
FY 2024	1,818,022	1,737,809	27,919	87,105
FY 2025	1,897,837	1,818,471	29,278	90,826
Total	$ 5,454,956	$ 5,214,471	$ 83,773	$ 261,355
Cost of Service (FY 2023 - FY 2025)	$ 5,454,956	$ 5,214,471	$ 83,773	$ 261,355
Projected Flows - FY 2023 to FY 2025 (MG)	1,075.42	913.82	4.50	54.75
Projected Rate (per MG)	$5,072.41	$5,706.26	$18,616.15	$4,773.69
Current Rate (per MG)	$4,485.27	$4,733.67	$7,321.20	$4,467.80
$ Change	$587.14	$972.59	$11,294.95	$305.89
% Change	13.1%	20.5%	154.3%	6.8%

As shown in the in Table 16, the calculated rates for Small PI Users ranged from $4,774 per MG to $18,616 per MG. As compared to existing rates, the projected rates are higher due to amortized capital costs, decreases in total flows, and decreases in flows as a percent of total flows received at the WWTP. Reserve capacity shares remain unchanged. Supporting rational for changes in projected rates as compared to existing rates is detailed in Table 17. Based on the calculated rates, the Small PI Users are expected to realize rate increases ranging from 6.8 percent to 154.3 percent, as compared to their existing cost recovery rates.

Table 17. Supporting Rationale for Changes in Projected Rates as Compared to Existing Rates

Description	Town of Vienna	Dulles International Airport	National Park Service	Department of the Navy
Projected Rate per MG	*$5,072.41*	*$5,706.26*	*$18,616.15*	*$4,773.69*
Difference from Current Rate	+$587.14, or 13.1% increase	+$972.59, or 20.5% increase	+$11,294.95, or 154.3% increase	+$205.89, or 6.8% increase
Operating	-$124,744, or 7.2% decrease	-$233,570, or 14.6% decrease	-$11,052, or 62.3% decrease	+$499, or 0.6% increase
Amortized Capital	+$359,919, or 10.3% increase	+$359,919, or 10.3% increase	+$7,198, or 10.3% increase	+$16,798, or 10.3% increase
WW Flow (MG)	-88.34, or 7.6% decrease	-161.06, or 15% decrease	-7.47, or 62.4% decrease	+.12, or .2% increase
WW Flow % of Total	12.6% decrease	19.6% decrease	64.4% decrease	5.2% decrease
Reserve Capacity Share	No Change	No Change	No Change	No Change

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