

MEMO

May 20, 2021

Re: Washington Aqueduct Discharge Rate Calculation for FY 2022

Dear Mr. Khalil,

DC Water engaged Raftelis Financial Consultants, Inc. (“Raftelis”) to calculate an appropriate rate for transporting and treating filter backwash flows from the Washington Aqueduct (WAD). WAD’s high volume, low strength wastewater that is easily interruptible through an EQ basin makes it distinct from DC Water’s other retail customer classes, as well as from DC Water’s permitted wastewater discharge customers. Because the circumstances surrounding the backwash flows are unique among DC Water’s existing customer classes, Raftelis recommends that DC Water charge WAD at a new Washington Aqueduct Discharge Rate. While this rate was designed using the characteristics of WAD’s flow, it would be available to any retail customers who meet the flow criteria:

- Discharge will be low strength (below 10mg/L for total suspended solids and biological oxygen demand on average).
- Discharge will be high volume (above 2.8 MGD on average).
- Discharge will be moderated through use of an equalization basin.
- Discharge will be interruptible during wet weather events.
- Discharge will be metered and monitored.
- Discharge will be governed by a Discharge Permit issued by DC Water.

Using previous rate calculations for DC Water and COS methodology as a basis, Raftelis calculated a Washington Aqueduct Discharge Rate of \$3.03 per Ccf. This letter describes the calculation method and justification for the rate.

Background

WAD produces drinking water for the District and neighboring jurisdictions in Virginia, and DC Water pays for 75% of WAD’s operating costs. WAD’s McMillan Filtration Plant currently has a waiver from EPA to send filter backwash to a cove in the McMillan Reservoir, but WAD approached DC Water in 2016 about the feasibility of sending filter backwash to the Blue Plains AWTP to meet the intent of EPA’s Filter Backwash Rule. DC Water agreed to accept the discharge at a nominal rate that would cover appropriate treatment and conveyance costs for the discharge.

To facilitate filter backwash discharge to DC Water, WAD was required to construct an equalization (EQ) basin. Construction of the EQ basin began in January 2021 and is expected

to be completed by the end of the calendar year. Flow into the DC Water collection system will be moderated through use of the EQ basin. Estimated flow will be 2.87 MGD and will be interruptible in the event of wet weather circumstances that could stress system capacity in the combined sewer system.

Because WAD's combination of low strength wastewater and high flow volumes is unique among DC Water's customers, Raftelis calculated a proposed new Washington Aqueduct Discharge Rate designed for a customer with a similar high flow and low strength combination to WAD. Raftelis used cost of service methodology to calculate the rate, starting with allocations originally developed for the 2018 Groundwater Discharge Cost of Service (COS) Study (the basis of DC Water's existing Groundwater Fee). The Washington Aqueduct Discharge Rate reflects significantly different circumstances and therefore distinct costs as compared to the Groundwater Fee. However, the Groundwater Fee is the most similar retail fee to the proposed Washington Aqueduct Discharge Rate, as it also reflects low strength wastewater discharge consistent with the characteristics of the WAD discharge.

Summary of DC Water's Board Policy on Rate Setting

- Rates that, together with other revenue sources, cover current costs and meet or exceed all bond and other financial requirements
- Rates that yield a reliable and predictable stream of revenues
- Rates based on annually updated forecasts of operating and capital budgets
- Rates structures that are legally defensible
- Rates structures that customers can understand
- Rate increases, if required, that are implemented transparently and predictably

Justification for a New Retail Rate Class

Since its inception, DC Water has relied on industry-accepted cost of service principles and a Board-adopted Rate Setting Policy to set retail rates and charges. DC Water may develop a new class of rates tailored to a customer's special circumstances provided that the rates do not violate Board Policy (see sidebar). In accordance with Policy, the proposed rate would promote financial sufficiency and revenue stability for DC Water in that it generates steady, positive net revenue for the utility. The Washington Aqueduct Discharge Rate would also be updated regularly through the cost of service process, meeting the Policy requirement that rates be based on annually updated forecasts of operating and capital budgets.

New retail rates are appropriate in situations where a new customer does not fit into an existing customer class. WAD has several special conditions that merit implementing a new rate class:

- Discharge will be low strength (below 10mg/L for total suspended solids and biological oxygen demand on average).
- Discharge will be high volume (above 2.8 MGD on average).
- Discharge will be moderated through use of an equalization basin.
- Discharge will be interruptible during wet weather events.
- Discharge will be metered and monitored.
- Discharge will be governed by a Discharge Permit issued by DC Water.

DC Water currently serves retail customers (e.g. residential and commercial customers), groundwater customers, and customers that discharge wastewater based on permitted requirements. WAD’s unique combination of low strength discharge and interruptible flows controlled through an EQ basin make it distinct from each of these three customer types.

WAD is different from a retail customer because a retail customer is assumed to have domestic strength discharge¹ and has no obligation or ability to control flow during wet weather. DC Water is obligated under its duty to serve to provide perpetual service to retail customers, regardless of wastewater strength or flows; in fact, DC Water must invest in infrastructure that is sufficient to support projections of peak retail strength and flows. In contrast, WAD’s consistently low strength discharge and ability to interrupt flows through the EQ basin mean it does not require infrastructure associated with pollutant-removal or peaking. In addition, although WAD flow rates will be controlled by the EQ basin and thus would not stress combined sewer capacity, the total anticipated flow volume for WAD (2.87 MGD) is much greater than that of any type of retail customer.

WAD is also different from DC Water’s groundwater-only customers. Like other retail customers, groundwater customers contribute to peak demand without any limits on flows or requirements for pretreatment, and DC Water is obligated to construct infrastructure that is sufficient to handle their contribution to coincidental system peaking. Because the Groundwater Fee was developed based on the assumption that groundwater would contribute to peak flow, Raftelis does not recommend using the Groundwater Fee for WAD.

While WAD’s flows could be regulated through DC Water’s existing permitting system, Raftelis recommends development of a new retail rate because typical permitted customers have very different characteristics from WAD. Most permitted discharge customers are significantly smaller than WAD in terms of volume, but most have high strength or categorical waste discharges, such as wastewater with a high concentration of metals. WAD’s low strength flows would not require use of DC Water’s pollution removal infrastructure; therefore, as is the case for the Groundwater Fee calculation, pollution removal costs should be excluded from the Washington Aqueduct Discharge Rate calculation.

Table 1: Comparison of DC Water Retail Customers

Retail Customer Groups	Size	Strength	Permitted	Interruptible?
Regular Discharge	Small-Medium	Domestic	No	No
Groundwater Discharge	Small-Medium	Low Strength	No	No
Permitted Discharge	Small-Medium	Categorical	Yes	No
Hauled Waste	Small-Medium	High Strength	Yes	N/A
WAD Discharge	High (> 1 MGD)	Low Strength	Yes	Yes

¹ Domestic strength discharge is any discharge with a domestic component up to 300 ppm in solids and/or BOD. DC Water’s infrastructure must be designed to accommodate domestic strength discharge.

The previous table summarizes the key differences among DC Water’s existing fees and rates and the proposed Washington Aqueduct Discharge Rate.

Rate Calculation Methodology

Raftelis referenced the allocations used in the 2018 Groundwater COS Study as the baseline for allocating FY 2022 wastewater revenue requirements to the Washington Aqueduct Discharge Rate. The Groundwater COS Study included proportionate cost recovery in several major areas:

1. Direct Operating Costs – These include direct costs for conveyance of flows to Blue Plains as well as pumping and storage within the plant.
2. Indirect Operating Costs – These include costs from the operating budget related to customer service, engineering, and permitting.
3. Administration Costs – These costs relate to areas like finance, human resources, information technology, facilities management, and security.
4. Capital Costs – These costs relate to capital investments in treatment and conveyance assets and include debt service and Paygo capital.

Raftelis used the same allocation factors developed to allocate costs in the Groundwater COS Study, with two exceptions to reflect the unique characteristics of the WAD flow. In the Groundwater COS Study, about 23% of capital costs were included, reflecting only the volumetric component of capital expense and excluding the pollution treatment component.² This 23% factor was further reduced by 54% to remove the peaking component³ of the collection system and Blue Plains, resulting in a net allocation factor of 23% multiplied by 54%, or about 12.6% of capital.

In addition to excluding a portion of capital costs, Raftelis recommends that some indirect operating costs be excluded from the rate calculation. Indirect operating costs include customer service, permitting, Clean Rivers, and engineering costs. WAD does not use DC Water’s customer service center—billing is handled through the Finance Department. Permitting Operations costs apply to development activity within the District and are largely covered by special fees, so they should not be recovered through the Washington Aqueduct Discharge Rate. Clean Rivers costs should be excluded because they relate to sewer overflows during wet weather events, and the use of the EQ basin will prevent WAD from contributing to sewer overflow. Engineering costs are directly related to capital costs, so the portion of engineering costs associated with the excluded capital costs (discussed above) should be removed from the calculation. In the Groundwater COS Study, 44% of engineering costs were included. This 44% allocation factor was reduced by the 54% factor, resulting in a net allocation of about 24%. Table 2 shows the operating cost allocations, while Table 3 shows the capital cost allocations.

² This split between volumetric costs and treatment costs was done as part of the Groundwater Fee calculation during the 2018 COS Study.

³ The 54% non-peaking factor was calculated by dividing average flows (300 MGD) by peak flows (555 MGD). Average and peak flow estimates were obtained by DC Water Staff.

Table 2: Wastewater Operating Cost Allocations

	2022 Wastewater	% Allocation Volume	% Allocation to Non-Peaking	2022 Allocated Amount
Operations				
Wastewater Treatment - Operations	\$82,145,589	64%	100%	\$52,366,747
Wastewater Treatment – Process Engineering	7,448,700	64%	100%	4,748,450
Maintenance Services	19,230,145	44%	100%	8,394,279
Water Services	-	0%	100%	-
Pumping/Sewer Services	39,109,403	100%	100%	39,109,403
Customer Service (1)	7,035,828	0%	0%	-
Water Distribution & Conveyance Systems	-	0%	0%	-
Engineering & Technical Services	3,380,449	44%	54%	797,634
Wastewater Engineering	3,455,781	44%	54%	815,409
DC Clean Rivers (1)	-	0%	0%	-
Permit Operations (1)	2,145,232	0%	0%	-
Administration				
General Manager	\$2,599,063	44%	100%	\$1,134,534
Office of the Secretary	357,780	44%	100%	156,177
Internal Audit	420,343	44%	100%	183,487
General Counsel	3,763,650	44%	100%	1,642,896
External Affairs	1,624,079	44%	100%	708,938
Human Capital Management	5,534,560	44%	100%	2,415,928
Information Technology	5,882,747	44%	100%	2,567,917
Procurement	3,584,431	44%	100%	1,564,664
Finance and Budget	15,515,142	44%	100%	6,772,618
Office – Support Services	359,217	44%	100%	156,804
Office of Emergency Management	848,505	44%	100%	370,386
Facilities & Security Management	4,906,538	44%	100%	2,141,786
Security	4,468,467	44%	100%	1,950,561
Occupational Safety & Health	1,322,865	44%	100%	577,453
Fleet Management	3,945,685	44%	100%	1,722,357
Total	\$219,084,200			\$106,231,922

1) Certain indirect operating expenses were excluded from the calculation, discussed above.

Table 3: Debt Service and Capital Allocations

	2022 Wastewater	% Allocation to Volume	% Allocation to Non-Peaking	2022 Allocated Amount
Existing Debt				
Senior Debt	\$33,604,717	23%	54%	\$4,218,195
Subordinate Debt	49,978,052	23%	54%	6,273,440
<i>Total Existing Debt</i>	<i>\$83,582,769</i>			<i>\$10,491,634</i>
Planned Debt				
WASA Bonds – Planned	\$12,284,735	23%	54%	\$1,542,028
<i>Total Planned Debt</i>	<i>\$12,284,735</i>			<i>\$1,542,028</i>
Total Allocated Capital				\$12,033,662

Like the Groundwater COS calculation, this calculation excludes Paygo capital. Table 4 shows a summary of all revenue requirements.

Table 4: Total Revenue Requirements

	2022 Wastewater	2022 Allocated Amount
Operating Costs		
Operations – Direct Costs	\$147,933,838	\$104,618,880
Operations – Indirect Costs	\$16,017,291	\$1,613,043
Administration/Overhead	\$55,133,071	\$24,066,506
Capital Costs		
Debt Service	\$95,867,504	\$12,033,662
Paygo (60% Coverage)	\$57,520,502	\$ -
<i>Total (excluding Paygo)</i>	<i>\$314,951,704</i>	<i>\$142,332,090</i>
<i>Total Wastewater Costs</i>	<i>\$372,472,206</i>	<i>45% of 2022 Wastewater</i>

In past COS Studies, miscellaneous revenues, or revenue offsets, were allocated across all fees and charges to reduce revenue requirements. Revenue offsets were allocated based on the proportion of allocated costs to total costs. As shown in Table 4 and Table 5, this ratio is 45%. This ratio is the proportion of miscellaneous revenue allocated to offset the revenue requirements used in development of the Washington Aqueduct Discharge Rate.

Table 5: Allocation of Revenue Offsets

	2022 Wastewater	% Allocation	2022 Allocated Amount
Wholesale Revenue			
LCSA + PI	\$(11,530,171)	45%	\$(5,210,683)
WSSC	(57,630,402)	45%	(26,044,170)
Fairfax County	(15,284,514)	45%	(6,907,335)
Other Revenue			
IMA Indirect Cost Reimbursement for Capital Projects	\$(5,218,000)	45%	(2,358,104)
Dev. Contr./Water Services Fees, Taps	-	45%	-
Dev. Contr./Liability Deposits/Sewer Service Fees	(2,000,000)	45%	(903,834)
Commercial Water Maintenance	-	45%	-
DC Fire Protection Fee	-	45%	-
System Availability Fee	(3,850,000)	45%	(1,739,881)
Transfer from DC PILOT/ROW Fund	-	45%	-
Transfer from Rate Stabilization	(7,350,000)	45%	(3,321,591)
DC Contribution of 50% PILOT Escrow to DCW	-	45%	-
Sales to DC Agencies – Stream/Meter	-	45%	-
Misc. Rev: Bid Deposits, Fleet Auction, Compost Sales	(6,000,000)	45%	(2,711,503)
Pipe Repair Sales/Replacement	-	45%	-
Stormwater	(1,000,000)	45%	(451,917)
Northern Virginia Debt Service	(146,867)	45%	(66,372)
WSRF	-	45%	-
Interest Income	(1,812,915)	45%	(819,287)
Total	\$(111,822,869)		\$(50,534,677)

Once allocated offsets (\$50,534,677) were subtracted from allocated revenue requirements (\$142,332,506), Raftelis used the resulting net revenue requirements as a proxy for the total cost of treating the WAD discharge, as shown in Table 6.

Table 6: Total Net Revenue Requirements for WAD Discharge

	2022 Allocated Amount
Operating Costs	\$142,332,090
Offsets	\$(50,534,677)
Total Net Revenue Requirements	\$91,797,413

The net revenue requirements of \$91,797,413 were divided by total sewer flows established during the 2020 COS Study for FY 2022, yielding the Washington Aqueduct Discharge Rate, shown in Table 7.

Table 7: Calculated Rate

Low Strength Net Revenue Requirements	\$91,797,413
Sewer Usage for FY 2022 (Ccf)	30,249,425
2022 Rate per Ccf	\$3.03

The Washington Aqueduct Discharge Rate and the Groundwater Fee are tied directly to the COS Study used for development of DC Water retail rates. During the future COS Studies, the first of which will set rates for FY 2023-FY 2024, DC Water should revisit this rate calculation based on updated wastewater revenue requirements and any other additional data, as available. For instance, WAD flows may act to increase total sewer usage (currently 30,249,425 Ccf per the COS Study), which would have a small impact on the rate calculation.

Summary of Recommendations and Conclusions

WAD’s unique combination of de minimis wastewater strength and interruptible flows make it distinct from DC Water’s existing customers. WAD’s flows will not impact DC Water’s wastewater peak demand, thus distinguishing WAD from retail customers. WAD’s low strength and high flow volumes make it distinct from permitted discharge customers, which typically produce low volume but high strength wastewater. Because WAD does not affect peak demand in terms of either wastewater strength or flows, it will not drive system peaking capacity and associated infrastructure investment, unlike DC Water’s existing customers. Therefore, peaking-related capital costs can reasonably be excluded from the calculation of the Washington Aqueduct Discharge Rate. Because the cost burden WAD places on DC Water is distinct from those of existing customer classes, Raftelis recommends establishing a new retail rate class corresponding to the proposed Washington Aqueduct Discharge Rate.

Establishment of a new rate is consistent with industry practice and does not undermine any existing retail rates, fees, and charges or the Rate Setting Policy. Raftelis calculated the Washington Aqueduct Discharge Rate to be \$3.03/Ccf using FY 2022 projections developed in the 2020 COS Study. This rate should be effective from the initiation of the WAD discharge through the end of FY 2022 (September 30, 2022) or until updated through a new COS Study.

Raftelis recommends updating the Washington Aqueduct Discharge Rate during the next COS Study, which will establish rates for FY 2023 and FY 2024. DC Water should consider including a provision in the WAD Agreement that specifies that the rate will be updated during the next COS Study. Regularly updating the rate will keep it in line with Board policy, which requires that rates be “based on annually updated forecasts of operating and capital budgets.”